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## **Final Environmental Impact Statement for the 2021 Land Management Plan**

**Volume 2: Chapter 3 (part 2), Index, Literature, Glossary, Preparers**

**Helena - Lewis and Clark National Forest**



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# Final Environmental Impact Statement for the 2021 Land Management Plan for the Helena – Lewis and Clark National Forest

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**Abstract:** This final environmental impact statement contains the analysis of six alternatives developed for the programmatic management of approximately 2,846,606 acres administered by the Helena – Lewis and Clark National Forest. It documents the analysis of the preferred alternative, four action alternatives, and one no-action alternative. The Forest Service has identified alternative F as the preferred alternative.

All alternatives retain direction in the 2018 Forest Plan Amendments to Incorporate Habitat Management Direction for the Northern Continental Divide Ecosystem Grizzly Bear Population, which was analyzed in the Final Environmental Impact Statement, Volume 3: Forest Plan Amendments to incorporate habitat management direction for the Northern Continental Divide Ecosystem Grizzly Bear Population. That analysis is not repeated here but is summarized and referenced as needed.

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### Acronyms

AUM	animal unit month
BASI	best available scientific information
BMP	best management practice
BE	biological evaluation
BO	biological opinion
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
CWN	conservation watershed network
DEIS	draft environmental impact statement
EIS	environmental impact statement
ESA	Endangered Species Act
FACTS	forest activity tracking system database
FEIS	final environmental impact statement
FIA	forest inventory and analysis
FS	Forest Service
FSH	Forest Service Handbook
FSM	Forest Service Manual
GA	geographic area
GIS	geographic information system
HLC NF	Helena - Lewis and Clark National Forest
HUC	hydrologic unit code
INFISH	Inland Native Fish Strategy
IRA	inventoried roadless area
LAU	lynx analysis unit
LRMP	land and resource management plan
MMBF	million board feet
MTDEQ	Montana Department of Environmental Quality
MFWP	Montana Department of Fish, Wildlife, and Parks
MTDNRC	Montana Department of Natural Resources and Conservation

NEPA	National Environmental Policy Act
NF	National Forest
NFMA	National Forest Management Act
NFS	National Forest System
NRLMD	Northern Rockies Lynx Management Direction
NRV	natural range of variation
PIBO	PACFISH/INFISH Biological Opinion
PCE	primary constituent elements
PTSQ	projected timber sale quantity
PWSQ	projected wood sale quantity
PVT	potential vegetation type
RFSS	Regional Forester sensitive species
RMZ	riparian management zone
RNA	research natural area
ROD	record of decision
ROS	recreational opportunity spectrum
RWA	recommended wilderness area
SCC	species of conservation concern
SIMPPLLE	Simulating Pattern and Process at Large Landscape Scales (model)
SIO	scenic integrity objective
SMZ	streamside management zone
TES	threatened, endangered, and sensitive species
TMDL	total maximum daily load
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
VMAP	vegetation map (geospatial database)
WCC	watershed condition class
WUI	wildland urban interface
WMU	wildlife management unit
WSA	wilderness study area
WSR	wild and scenic river

## Chapter 3. Affected Environment and Environmental Consequences (Part 2)

### 3.16 Recreation Settings

#### 3.16.1 Introduction

Recreation is recognized as a critical resource on the HLC NF due to its contributions to the local economy, its influence in connecting people to the land, its impact on public understanding of natural and cultural resources, and its role as a catalyst for public stewardship. To address both the challenges and opportunities in recreation management, the FS strives to provide a set of recreation settings, opportunities, and benefits that are sustainable over time. Sustainable recreation is defined as the set of recreation settings and opportunities on the NF that are ecologically, economically, and socially sustainable for present and future generations. For best effect, all aspects of recreation should include the principle of sustainability. As such, the HLC NF FEIS describes the effects of plan components that work cumulatively to provide direction for a sustainable recreation program.

Recreation settings are the social, managerial, and physical attributes of a place that, when combined, provide a distinct set of recreation opportunities and access options. These settings provide the framework where specific recreation opportunities, activities, and expected experiences are integrated to ensure compatibility with the landscape's natural, social, and cultural resource values. By identifying recreation settings, the Forest can ensure a sustainable set of recreation opportunities for future generations and visitors can select where they recreate based on what they want to do, what equipment they want to bring, and the type of experience they want.

The FS uses the recreation opportunity spectrum to define recreation settings. The recreation opportunity spectrum (ROS) is categorized into six distinct classes: primitive, semiprimitive nonmotorized, semiprimitive motorized, roaded natural, rural, and urban (36 CFR 219.19). See the glossary for detailed definitions of each recreation opportunity class.

The 2012 Planning Rule requires the use of ROS through the planning process. Baseline ROS maps were developed for the entire HLC NF. These ROS maps reflect current travel plan management decisions for both summer and winter recreation uses on the forest. (For additional information about travel plans on the forest see the Recreation Access section, 3.19).

In April 2018, the Forest Service finalized the updated National Recreation Opportunity Spectrum (ROS) Inventory Mapping Protocol. While the base ROS maps for the the Plan revision were already developed by this time, the updated mapping protocol provided additional guidance for not only how ROS categories were mapped but also what activities were appropriate in each of the ROS settings. It was also used to inform the associated plan components used in this analysis. Adherence to this protocol contributes to the consistent application of ROS settings across NFS lands.

FSM 2310 states that the latest direction will be used for the mapping of Recreation Opportunity Spectrum (ROS). The mapping protocol is posted in the national data dictionary at: [http://fsweb.datamgt.fs.fed.us/current\\_data\\_dictionary/index.shtml](http://fsweb.datamgt.fs.fed.us/current_data_dictionary/index.shtml).

#### Issues

A number of issues on recreation settings were raised during the scoping period on the proposed action and the comment period for the DEIS. The issues that drove alternatives were:

- Changes to ROS settings associated with recommended wilderness area (RWA) designations.
- Primitive ROS settings outside of RWAs.
- Site specific changes to ROS settings to address mapping errors found during the analysis period.

### Measurement indicators

Effects to ROS settings will be measured by determining the acres of desired ROS and winter ROS settings by alternative.

### Analysis area

The geographic scope of the analysis is the lands administered by the HLC NF. All lands within the forest boundary form the geographic scope for cumulative effects. The temporal scope is the life of the plan (approximately 15 years).

### Changes between draft and final

A number of changes to ROS settings were made for the FEIS; however, all changes are within the scope of the analysis and address issues that the public has had an opportunity to comment on:

- The desired ROS setting maps for all alternatives were changed between draft and final. These minor changes were the result of better information and more specific mapping data.
- The descriptions for each ROS setting was updated and clarified in the glossary.
- In alternative F, primitive ROS settings, outside of recommended wilderness areas (RWAs), were identified for the Deep Creek, Tenderfoot Creek, Elkhorns core area, Badger Two Medicine, and the Grandview Recreation Areas.
- Analysis for alternative F was added in the FEIS. The ROS settings for this alternative were based on public and internal comments.

### 3.16.2 Regulatory framework

**Americans with Disabilities Act of 1990 (P.L. 101-336):** This act prohibits discrimination against people with disabilities in several areas, including employment, transportation, public accommodations, communications and access to state and local government programs and services.

**Architectural Barriers Act of August 12, 1968 (P.L. 90-480, 82 Stat. 718 51 U.S.C. 4151-4154, 4154a, 4155-4157):** This act establishes additional requirements to ensure that buildings, facilities, rail passenger cars, and vehicles are accessible to individuals with disabilities. It covers architecture and design, transportation, and communication elements of recreational site planning and development.

**Federal Lands Recreation Enhancement Act of December 8, 2004 (P.L. 108-447, as amended):** This act gives the Secretaries of Agriculture and Interior the authority to establish, modify, charge, and collect recreation fees at federal recreational lands where a certain level of amenities have been developed.

**Land and Water Conservation Fund Act of 1965 (P.L. 88-578, 78 Stat. 897 as amended; 16 U.S.C. 4601-4(note); 4601-4 thru 6a, 4601-7 thru 4601-10, 4601-10a-d, 4601-11):** “The purposes of this act are to assist in preserving, developing, and assuring accessibility to all citizens of the United States of America...such quality and quantity of outdoor recreation resources...providing funds for:” 1. States for acquisition, planning, and development of recreation facilities and; 2. Federal acquisition and development of certain lands and other areas.

**National Recreation Opportunity Spectrum (ROS) Inventory Mapping Protocol update, April 2018:** A National Forest guide that provides guidance for not only how ROS categories are mapped but

also what activities are appropriate in each ROS setting. This protocol is an update to earlier direction for the mapping of ROS. A National ROS Mapping Protocol was first written in 2003. The 2018 ROS mapping protocol update provides consistent National guidance for ROS mapping and integrates travel management decisions into the inventory process. It is based on the established ROS Class Delineations defined in the 1982 ROS Users Guide, the 2003 National ROS Inventory Mapping Protocol, and integration with the most recent corporate databases.

**Rehabilitation Act of September 26, 1973** (P.L. 93-112, Title V, 87 Stat. 390, as amended; 29 U.S.C. 791, 793-794, 794a, 794b): This act requires that programs and activities conducted by federal agencies and by entities that receive funding from, or operate under a permit from, federal agencies provide an equal opportunity for individuals with disabilities to participate in an integrated setting, as independently as possible. The only exception to the requirement is when the program would be fundamentally altered if changes were made solely for the purpose of accessibility.

**Ski Fees, Omnibus Parks and Public Lands Management Act of November 12, 1996** (Pub. L. 104-333, div. I, Title VII, Sec. 701, 110 Stat. 4182; 16 U.S.C. 497c): Section 701 of this act:

- Establishes a system to calculate fees for ski area permits issued under the National Forest Ski Area Permit Act of 1986 (16 U.S.C. 497b);
- Provides for holders of ski area permits issued under other authorities to elect this permit fee system (FS Handbook 2709.11, sec. 38.03a);
- Includes provisions concerning compliance with NEPA when issuing permits for existing ski areas (FS Manual 2721.61f and FS Handbook 2709.11, sec. 41.61b); and
- Withdraws leasable and locatable minerals, subject to valid existing rights (FS Handbook 2709.11, sec. 41.61c).

### ***3.16.3 Assumptions***

Since adoption of the 1986 plans, recreation activities within the planning area have changed. This analysis assumes that changes to recreational use patterns would occur naturally as a result of factors associated with recreation trends, increases in local populations, advances in technology, aging population, aging infrastructure, and climatic changes.

### ***3.16.4 Best available scientific information used***

The Forest used the best available data and scientific information relevant to inform the analysis for plan components for recreation settings, recreation opportunities, recreation special uses, and recreation access. Data sources included the latest information from the National Visitor Use Data project, information stored in the corporate data base, and site-specific knowledge from forest personnel.

### ***3.16.5 Affected environment***

Sustainable recreation settings are the social, managerial, and physical attributes of a place that, when combined, provide a distinct set of recreation opportunities. Sustainable recreation settings and opportunities are affected by trends in recreation uses and the mix of outdoor activities chosen by the public, which continuously evolve. Recreation activities offered on the HLC NF include, but are not limited to, cross-country and downhill skiing, snowboarding, snowmobiling, dog sledding, hiking, backpacking, horseback riding, mountain biking, camping, hunting, fishing, off-highway vehicle driving or riding, picnicking, swimming, boating, paddle boarding, recreation aviation, wildlife watching, visiting historic sites or scenic areas, participating in interpretive programs or tours, and resort use. The FS utilizes a framework called ROS settings which describes different settings across the landscape and

attributes associated with those settings. All six of the ROS settings are found within the HLC NF. Table 109 defines these settings.

**Table 109. ROS settings and definitions**

ROS setting	Definition
Primitive	Large, remote, wild, and predominately unmodified landscapes. Areas with no motorized activity and little probability of seeing other people. Primitive ROS settings are managed for quiet solitude away from roads, people, and development. There are few if any facilities or developments.
Semiprimitive nonmotorized	Areas of the Forests managed for nonmotorized use. Uses include hiking and equestrian trails, mountain bikes and other nonmotorized mechanized equipment. Rustic facilities and opportunity for exploration, challenge, and self-reliance.
Semiprimitive motorized	Backcountry areas used primarily by motorized users on designated routes. Roads and trails designed for off-highway vehicles and high-clearance vehicles. Offers motorized opportunities for exploration, challenge, and self-reliance. Rustic facilities. Often provide portals into adjacent Primitive or Semiprimitive Nonmotorized areas.
Roaded natural	Often referred to as front country recreation areas, these areas are accessed by open system roads that can accommodate sedan travel. Facilities are less rustic and more developed with campgrounds, trailheads and airstrips often present. Provide access points for adjacent semiprimitive motorized, semiprimitive nonmotorized, and primitive settings.
Rural	Highly developed recreation sites and modified natural settings. Easily accessed by major highways. Located within populated areas where private land and other land holdings are nearby and obvious. Facilities are designed for user comfort and convenience.
Urban	Areas with highly developed recreation sites and extensively modified natural settings. Often located adjacent to or within cities or high population areas. High probability of seeing large groups of people and opportunities for solitude or silence are few.

### 3.16.6 Environmental consequences

#### Effects common to all alternatives

In all alternatives, natural disturbances, changes in population, recreation use patterns, and emerging technologies would continue to influence recreation settings across these landscapes. Travel plans would continue to provide site-specific direction for where motorized uses could take place. Additional management direction for recreation may also be provided through recreation special use permits, or, in the cases where recreation uses need to be restricted, through closure orders outside of travel plans.

#### Effects common to all action alternatives

The plan components developed for ROS settings remain the same in all action alternatives. The combined effects of these plan components would move the HLC NF toward a sustainable recreation program where recreation activities take place in a variety of settings across the forest. Table 110 summarizes each plan component related to recreation settings.

**Table 110. Summary of plan components for recreation (ROS) settings**

ROS setting plan component	Summary of plan components for recreation settings
FW-ROS-DC-01 through 13	These plan components set up the desired distribution of ROS settings, as well as provide descriptions of each of these settings. The specific locations for each ROS setting are mapped by GA for the entire Forest. Recreation opportunity settings establish the expectations for recreation settings across the forest.

ROS setting plan component	Summary of plan components for recreation settings
FW-ROS-STD-01 through 05	These standards would provide clear direction on the construction of recreation facilities, such as motorized roads and trails, airstrips, and trailheads for each ROS setting.
FW-ROS-GDL-01 through 10	These guidelines provide direction for the SIOs of each area, and the expectations of vegetative management in each of the ROS settings.
FW-ROS-SUIT-01 through 33	The suitability plan components lay out specifically where motorized and mechanized means of transportation, and airstrips may and may not be suitable within the desired ROS settings on the Forest.

### *Settings for recreation aviation*

Public commenters asked for the allowance of more access for recreation aviation activities, especially for provisions for airstrips or locations where motorized aircraft may take off and land.

Access for recreation aviation activities would be determined by the ROS settings for all action alternatives. Motorized recreation aviation activities are most appropriate in motorized ROS settings. Nonmotorized recreation aviation uses, such as glide planes and hang gliders, may be found in nonmotorized ROS settings. Facilities constructed in nonmotorized settings would be designed and constructed to meet the facilities development direction for nonmotorized settings.

The specifics of where recreation aviation activities may occur is detailed in the suitability plan components in the Plan.

### *Definition of primitive ROS settings*

Public commenters also asked that the definition for primitive ROS settings include language that would prohibit the use of mechanized means of transportation (including bicycles). The National Recreation Opportunity Spectrum (ROS) Inventory Mapping Protocol, April 2018, provides guidance for not only how ROS settings are mapped but also what activities are appropriate in each ROS setting. Adherence to this protocol contributes to the consistent application of ROS settings across NFS lands. In accordance with this National protocol, mountain bikes are suitable in all ROS settings, unless those areas are specifically closed due to legislative action, such as congressionally designated wilderness, or by closure order at the Forest or District levels.

During the formation of the Proposed Action, the HLC NF misinterpreted the National direction for Primitive ROS settings and stated that mountain bikes would not be suitable within these primitive ROS settings. This is incorrect and not congruent with the national direction. The HLC NF corrected this error in both the draft and the final EIS. The Plan would follow national direction and would allow all forms of nonmotorized recreation uses within primitive ROS settings, including bicycles, unless this use is specifically prohibited by Congressional law or Forest closure order.

### *Effects from forest plan components associated with:*

#### **Aquatic ecosystems and soil management**

Activities related to watershed, soil, riparian, or aquatic habitat improvements would have little to no effects related to the overall management of recreation settings.

#### **Fire and fuels management**

Natural, unplanned fires would continue to affect the long-term ecological processes across recreation settings. Fire effects could include a temporary loss of vegetation, reduction in water quality due to sedimentation, and air pollution. However, these effects are part of natural, ecological processes.

**Timber and vegetation management**

Timber management would continue on lands suitable for timber production and in those areas where timber harvest could be used as a tool to enhance other resource values. These activities would be most noticeable in the semi primitive motorized, roaded natural, and rural ROS settings. All action alternatives establish suitability direction for the management of timber and vegetation within ROS settings. The sights and sounds of timber sales and associated road building activities may temporarily impact nonmotorized recreation settings.

**Livestock grazing and management**

Livestock grazing would continue to occur in active allotments across the forest and livestock may be found in all recreation settings. The locations of facilities associated with grazing, such as water features and extensive fencing, may have an impact on the less developed recreation settings. The action alternatives provide suitability direction for the management of grazing within developed recreation sites.

**Wildlife habitat management**

Activities related to wildlife habitat improvements and management would occur across all ROS settings. These activities are expected to have little to no effect to recreation settings.

**Recreation and scenery management**

Recreation settings are most affected by the presence or absence of motorized uses. These uses can take place on constructed features such as roads, trails, or airstrips, or they may take place cross country as with motorized over-snow recreation. Travel plans that establish where motorized use can or cannot take place would support and help maintain recreation settings for both summer and winter. All action alternatives establish desired ROS settings that would provide future direction for motorized access and construction/reconstruction of infrastructure.

**Cultural, historic, and tribal resource management**

There are many historic recreation residences and historic special use resorts that contribute to the roaded natural and rural ROS settings on the HLC NF. The action alternatives provide direction for the management of these historic structures.

**Road access and infrastructure**

ROS settings are based on the location of roads, trails, and infrastructure and on whether these features are open and available for motorized and nonmotorized public recreational uses. Travel plans establish where motorized use can or cannot take place and support and help maintain ROS settings for both summer and winter. All action alternatives establish desired ROS settings that would provide future direction for motorized access and construction/reconstruction of infrastructure.

**Minerals management**

Areas with active mining may occur across all recreation settings within the HLC NF. Evidence of historic and ongoing mining on forest is an expected part of these settings. New and ongoing mining may affect the recreation settings by creating roads and openings that might not normally be located within certain settings. Additionally, mine reclamation may have impacts on recreation settings, at least in the short-term.

**Alternative A, no action**

In alternative A, recreation settings would continue to be managed under the 1986 Helena NF and Lewis and Clark NF Plans. Travel plans would continue to provide the direction for where motorized uses can and cannot occur, and future wilderness and other laws may determine where various ROS classes may be located. Table 111 describes the plan components in the 1986 plans that provide direction for ROS settings.



**Table 111. Summary of existing 1986 plan components for recreation settings**

Plan component	Summary of 1986 plan component for recreation settings
1986 Helena NF Plan Objectives, Resource Activity/Summaries, Recreation and Roadless Page II/2.	<u>Recreation</u> : this objective highlights that approximately 40% of the Forest would be managed in a way that provides primitive or semiprimitive recreation. <u>Roadless</u> : this objective lists specific areas of undeveloped acres outside of wilderness that would remain undeveloped and managed for semiprimitive recreation values. Additionally, this objective mentions large blocks over 5,000 acres in size with other resource goals, such as wildlife, that would also be managed for semiprimitive recreation.
1986 Helena NF Plan Management Areas R-1, P-3; Page III/24	Management area R-1 provides direction for large blocks of undeveloped lands suited for dispersed recreation. Motorized uses are not suitable in these areas and they are managed for semiprimitive nonmotorized recreation opportunities. Primitive and semiprimitive nonmotorized recreation settings are described for the Big Log RWA in management area P-3.
1986 Helena NF Plan Analysis of the Management Situation Summary, Resource and Support Program Elements, Recreation, Page AMS Summary V/2.	The analysis of the management situation discusses the demand, supply, and production potential of recreation on the Helena NF. The tables and narrative in this section discuss the potential for growth and the ability of the forest to handle the expected potential growth patterns in all of the ROS settings.
1986 Lewis and Clark NF Plan, Forest-wide Objectives, Resource Activity/Summaries, Recreation, Page 2-4.	This objective highlights that approximately 65% of the Forest would be managed in a way that provides primitive or semiprimitive recreation.
1986 Lewis and Clark NF Plan, Desired Future Conditions, First Decade, Rocky Mountain Division and Jefferson Division, Page 2-19.	<u>Rocky Mountain Division</u> : This desired future condition states that the high-quality opportunities for semiprimitive motorized and semiprimitive nonmotorized opportunities would remain unchanged. <u>Jefferson Division</u> : Desired future condition mentions maintaining semiprimitive recreation in the Middle Fork/Lost Fork Judith and Big Snowies.
1986 Lewis and Clark NF Plan, Desired Future Conditions, Fifth Decade, Jefferson Division, Page 2-21.	<u>Jefferson Division</u> : This desired future condition predicts that semiprimitive recreation opportunities would decrease slightly and roaded natural opportunities would increase. Also, semiprimitive recreation would be maintained in the Middle Fork/Lost Fork Judith and Big Snowies areas.
1986 Lewis and Clark NF Plan, Management Areas, Pages 3-3 through 3-104.	Recreation settings are established for each of the management areas on the Forest.

The 2012 Planning Rule requires the mapping of desired ROS settings and the use of this information in revised forest plans. For comparison purposes in the analysis, ROS maps for alternative A were derived using current travel plan information and site-specific knowledge from forest personnel. Table 112 depicts the estimated acreages and percent total of the estimated existing ROS settings for in alternative A. Table 113 displays the percent of each estimated existing ROS setting in each GA.

**Table 112. Existing forestwide ROS settings (alternative A)**

Existing ROS setting	Acres	Percent of total NFS lands
Primitive	758,504	26
Semiprimitive nonmotorized	1,025,709	36
Semiprimitive motorized	366,453	13

Existing ROS setting	Acres	Percent of total NFS lands
Roaded natural	703,723	24
Rural	28,838	1
Urban	0	0

**Table 113. Percent of ROS setting by GA (alternative A)**

GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Big Belts	15	34	12	36	3	0
Castles	0	24	24	52	0	0
Crazies	0	59	26	15	0	0
Divide	8	42	11	35	4	0
Elkhorns	0	58	4	36	2	0
Highwoods	0	71	19	10	0	0
Little Belts	8	28	28	36	<1	0
Rocky Mountain Range	58	35	3	4	<1	0
Snowies	75	3	6	15	1	0
Upper Blackfoot	26	48	2	24	<1	0

Table 114 depicts the estimated acreages and percent total of the estimated existing ROS settings for winter in alternative A. Table 115 displays the percent of each estimated existing ROS setting for winter in each GA.

**Table 114. Existing forestwide recreation opportunity settings – winter (alternative A)**

Existing ROS setting	Acres	Percent of total NFS lands
Primitive	740,469	26
Semiprimitive nonmotorized	1,099,434	38
Semiprimitive motorized	752,452	26
Roaded natural	262,562	9
Rural	28,310	1
Urban	0	0

**Table 115. Percent of ROS setting by GA in the winter (alternative A)**

GA	Primitive	Semprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Big Belts	15	40	26	16	3	0
Castles	0	19	81	0	0	0
Crazies	0	62	38	0	0	0
Divide	8	27	36	24	5	0
Elkhorns	0	73	21	4	2	0
Highwoods	0	73	27	0	0	0

GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Little Belts	8	42	38	12	<1	0
Rocky Mountain Range	58	36	5	1	<1	0
Snowies	63	3	31	3	0	0
Upper Blackfoot	26	31	28	15	<1	0

### Alternative B

Alternative B would establish desired ROS settings for each GA, as per the direction in FSH1909.12, Land Management Planning Handbook. Desired ROS settings would provide direction for management of a sustainable recreation program on the forest.

The desired ROS settings in alternative B are consistent with existing travel plans except where they were adjusted to incorporate ROS setting changes resulting from the inclusion of recommended wilderness areas (RWAs). There are nine (9) RWAs identified in alternative B. Since RWAs contain wilderness characteristics and have potential for inclusion in future wilderness designations, they would be allocated primitive ROS settings in alternative B.

Table 116 depicts the acreages and percent total of the desired ROS settings in alternative B. Table 117 displays the percent of each desired ROS setting in each GA. The allocation of RWAs in alternative B would increase the amount of desired primitive ROS settings on the HLC NF. As a result of this increase, the total amount of semiprimitive nonmotorized ROS settings across the forest would be reduced.

**Table 116. Desired forestwide ROS settings (alternative B)**

Desired ROS Setting	Acreage	Percent of Total NFS lands
Primitive	846,114	29
Semiprimitive nonmotorized	949,404	33
Semiprimitive motorized	368,173	13
Roaded natural	690,554	24
Rural	28,982	1
Urban	0	0

**Table 117. Percent of ROS setting by GA (alternative B)**

GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Big Belts	15	34	12	36	3	0
Castles	0	24	24	52	0	0
Crazies	0	59	26	15	0	0
Divide	16	36	11	33	4	0
Elkhorns	0	59	4	35	2	0
Highwoods	0	71	19	10	0	0
Little Belts	10	26	28	36	<1	0
Rocky Mountain Range	58	35	3	4	<1	0
Snowies	81	0	5	13	1	0

GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Upper Blackfoot	42	34	2	22	<1	0

Table 118 depicts the acreages and percent total of the desired ROS settings for winter in alternative B. Table 119 displays the percent of each desired ROS setting for winter in each GA.

**Table 118. Desired forestwide ROS settings - winter (alternative B)**

Desired ROS setting	Acres	Percent of total NFS lands
Primitive	841,599	29
Semiprimitive nonmotorized	1,030,181	36
Semiprimitive motorized	732,671	25
Roaded natural	250,344	9
Rural	28,432	1
Urban	0	0

**Table 119. Percent of ROS setting by GA in the winter (alternative B)**

GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Big Belts	15	40	27	15	3	0
Castles	0	19	81	0	0	0
Crazies	0	62	38	0	0	0
Divide	16	23	33	23	5	0
Elkhorns	0	73	21	4	2	0
Highwoods	0	73	27	0	0	0
Little Belts	10	40	38	12	<1	0
Rocky Mountain Range	58	36	5	1	<1	0
Snowies	81	<1	19	<1	0	0
Upper Blackfoot	42	17	28	13	<1	0

## Alternative C

The primary desired ROS settings for alternative C would be very similar to the desired ROS settings in alternative B and in most GA's the ROS settings would be the same. The primary difference between alternative B and C is that in alternative C, motorized and mechanized means of transportation would be suitable within RWAs. The RWAs would be allocated primitive ROS settings, except in those few small areas where motorized access would be suitable. Most GAs would see no change from the ROS allocations in alternative B.

Additionally, a change to the winter ROS settings in the Elkhorns would occur in alternative C. Currently, in the winter, a portion of the Elkhorns, north of Tizer loop is allocated as a semiprimitive motorized ROS setting. In alternative C, this semiprimitive motorized ROS setting would be changed to a semiprimitive nonmotorized ROS setting. See the Recreation Access section and appendix K for further discussion and effects.

The distribution of ROS settings in alternative C is noted in Table 120. Table 121 displays the percent of each desired ROS setting in each GA. There would be an increase of primitive ROS due to the identification of RWAs in alternative C.

**Table 120. Desired forestwide ROS settings (alternative C)**

Desired ROS setting	Acres	Percent of total NFS land
Primitive	846,114	29
Semiprimitive nonmotorized	949,465	32
Semiprimitive motorized	368,173	13
Roaded natural	693,493	24
Rural	28,982	1
Urban	0	0

**Table 121. Percent of ROS Setting by GA (alternative C)**

GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Big Belts	15	34	12	36	3	0
Castles	0	24	24	52	0	0
Crazies	0	59	26	15	0	0
Divide	16	35	11	34	4	0
Elkhorns	0	57	4	37	2	0
Highwoods	0	71	19	10	0	0
Little Belts	10	26	28	36	<1	0
Rocky Mountain Range	58	35	3	4	<1	0
Snowies	81	<1	5	13	1	0
Upper Blackfoot	42	34	2	22	<1	0

The distribution of ROS settings for winter in alternative C is noted in Table 122. Table 123 displays the percent of each desired ROS setting for winter by GA.

**Table 122. Desired forestwide ROS settings - winter (alternative C)**

Desired ROS setting	Acres	Percent of total NFS lands
Primitive	828,441	29
Semiprimitive nonmotorized	1,048,041	36
Semiprimitive motorized	727,904	25
Roaded natural	250,409	9
Rural	28,432	1
Urban	0	0

**Table 123. Percent of ROS setting by GA in the winter (alternative C)**

GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Big Belts	15	40	27	15	3	0
Castles	0	19	81	0	0	0
Crazies	0	62	38	0	0	0
Divide	16	23	33	23	5	0
Elkhorns	0	84	10	4	2	0
Highwoods	0	73	27	0	0	0
Little Belts	10	40	38	12	<1	0
Rocky Mountain Range	58	36	5	1	<1	0
Snowies	70	<1	30	<1	0	0
Upper Blackfoot	42	17	28	13	<1	0

### Alternative D

Alternative D responds to comments received during public scoping asking the Forest to consider an alternative that increases the amount of RWAs and primitive recreation opportunities outside of RWAs on the forest. Additional RWAs and additional primitive, undeveloped areas outside of RWAs were identified in this alternative.

The increase of RWAs and the emphasis on undeveloped areas would create a notable increase in the amount of primitive ROS and a corresponding decrease in both the semiprimitive nonmotorized and semiprimitive motorized ROS settings. Table 124 displays the ROS settings for alternative D. Table 125 displays the percent of each desired ROS setting in each GA.

**Table 124. Desired forestwide ROS settings (alternative D)**

Desired ROS setting	Acres	Percent of total NFS Lands
Primitive	1,232,947	43
Semiprimitive nonmotorized	608,343	21
Semiprimitive motorized	341,912	12
Roaded natural	672,774	23
Rural	27,251	1
Urban	0	0

**Table 125. Percent of ROS setting by GA (alternative D)**

GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Big Belts	22	28	12	35	3	0
Castles	44	5	1	50	0	0
Crazies	43	19	26	12	0	0
Divide	30	24	11	31	4	0
Elkhorns	31	26	4	37	2	0
Highwoods	20	50	20	10	0	0
Little Belts	22	17	26	35	<1	0

GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Rocky Mountain Range	74	19	3	4	<1	0
Snowies	81	<1	6	13	1	0
Upper Blackfoot	42	34	2	22	<1	0

Table 126 displays the winter ROS settings for alternative D. Table 127 displays the percent of each desired ROS setting for winter in each GA.

**Table 126. Desired forestwide ROS settings - winter (alternative D)**

Desired ROS Setting	Acres	Percent of total NFS lands
Primitive	1,219,100	42
Semiprimitive nonmotorized	709,591	25
Semiprimitive motorized	680,203	24
Roaded natural	247,574	8
Rural	26,758	1
Urban	29	<1

**Table 127. Percent of ROS setting by GA in the winter (alternative D)**

GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Big Belts	22	33	27	15	3	0
Castles	44	13	43	0	0	0
Crazies	43	27	30	0	0	0
Divide	30	16	28	22	4	0
Elkhorns	23	50	22	4	2	0
Highwoods	21	52	27	0	0	0
Little Belts	22	30	36	12	<1	0
Rocky Mountain Range	75	19	5	1	<1	0
Snowies	81	<1	19	<1	0	0
Upper Blackfoot	42	17	28	13	<1	0

## Alternative E

Alternative E responds to comments received during public scoping asking the Forest to consider an alternative that did not contain RWAs and that increased the amount of NFS lands available for timber harvest. In response to these comments, the desired ROS settings in alternative E shifted, resulting in an increase in motorized ROS settings (semiprimitive motorized and roaded natural) and a decrease in the amount of primitive ROS settings. This shift would also occur in the winter ROS settings.

Table 128 displays the ROS settings for alternative E. Table 129 displays the percent of each desired ROS setting in each GA.

**Table 128. Desired forestwide ROS settings (alternative E)**

Desired ROS Setting	Acres	Percent of Total NFS Lands
Primitive	724,316	25
Semiprimitive nonmotorized	1,050,936	36
Semiprimitive motorized	246,639	9
Roaded natural	833,514	29
Rural	27,822	1
Urban	0	0

**Table 129. Percent of ROS setting by GA (alternative E)**

GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Big Belts	10	38	7	42	3	0
Castles	0	24	24	52	0	0
Crazies	0	59	25	16	0	0
Divide	0	49	1	46	4	0
Elkhorns	0	59	4	35	2	0
Highwoods	0	71	18	11	0	0
Little Belts	8	28	19	45	<1	0
Rocky Mountain Range	58	35	3	4	<1	0
Snowies	75	4	0	21	<1	0
Upper Blackfoot	26	48	<1	26	<1	0

Table 130 displays the winter ROS settings for alternative E. Table 131 displays the percent of each desired ROS setting for winter in each GA.

**Table 130. Desired forestwide ROS settings - winter (alternative E)**

Desired ROS Setting	Acres	Percent of Total NFS Lands
Primitive	706,280	24
Semiprimitive nonmotorized	1,129,525	39
Semiprimitive motorized	338,208	12
Roaded natural	680,832	24
Rural	28,381	1
Urban	0	0

**Table 131. Percent of recreation opportunity setting by GA in the winter (alternative E)**

GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Big Belts	10	45	10	32	3	0
Castles	0	19	35	46	0	0
Crazies	0	62	11	27	0	0



GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Divide	0	35	8	52	5	0
Elkhorns	0	73	21	4	2	0
Highwoods	0	73	27	0	0	0
Little Belts	8	42	13	37	<1	0
Rocky Mountain Range	58	36	5	1	<1	0
Snowies	64	3	13	20	0	0
Upper Blackfoot	26	30	19	25	<1	0

## Alternative F

Alternative F responds to comments received during public comments to the DEIS and includes seven (7) RWAs. Similar to alternative D, additional primitive, undeveloped areas outside of RWAs were also identified in alternative F.

Similar to alternative C, a change to the winter ROS settings in the Elkhorns would occur in alternative F. Currently, in the winter, a portion of the Elkhorns, north of Tizer loop is allocated a semiprimitive motorized ROS setting. In alternative F, this semiprimitive motorized ROS setting would be changed to a semiprimitive nonmotorized ROS setting. See the Recreation Access section for further discussion and effects.

The ROS settings in alternative F shifted due to these changes, resulting in an increase in primitive ROS settings and a decrease in the amount of semiprimitive nonmotorized ROS settings. Table 132 displays the ROS settings for alternative F. Table 133 displays the percent of each desired ROS setting in each GA.

**Table 132. Desired forestwide ROS settings -alternative F**

Desired ROS Setting	Acres	Percent of Total NFS Lands
Primitive	1,034,715	36
Semiprimitive nonmotorized	758,488	26
Semiprimitive motorized	368,338	13
Roaded natural	692,704	24
Rural	28,982	1
Urban	0	0

**Table 133. Percent of ROS setting by GA - alternative F**

GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Big Belts	15	34	12	36	3	0
Castles	0	24	24	52	0	0
Crazies	0	59	26	15	0	0
Divide	16	35	11	34	4	0
Elkhorns	28	30	4	36	2	0
Highwoods	0	71	19	10	0	0
Little Belts	13	23	28	36	<1	0

GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Rocky Mountain Range	74	19	3	4	<1	0
Snowies	81	0	5	13	1	0
Upper Blackfoot	40	36	2	22	<1	0

Table 134 displays the winter ROS settings for alternative F. Table 135 displays the percent of each desired ROS setting for winter in each GA.

**Table 134. Desired forestwide ROS settings - winter (alternative F)**

Desired ROS Setting	Acres	Percent of Total NFS Lands
Primitive	1,017,244	35
Semiprimitive nonmotorized	856,799	30
Semiprimitive motorized	726,772	25
Roaded natural	253,980	9
Rural	28,432	1
Urban	0	0

**Table 135. Percent of recreation opportunity setting by GA in the winter (alternative F)**

GA	Primitive	Semiprimitive nonmotorized	Semiprimitive motorized	Roaded natural	Rural	Urban
Big Belts	15	40	27	15	3	0
Castles	0	19	81	0	0	0
Crazies	0	62	38	0	0	0
Divide	16	23	32	24	5	0
Elkhorns	29	56	9	4	2	0
Highwoods	0	73	27	0	0	0
Little Belts	12	38	38	12	<1	0
Rocky Mountain Range	75	19	5	1	<1	0
Snowies	70	0	30	<1	0	0
Upper Blackfoot	40	18	28	14	<1	0

### Cumulative Effects

Portions of the HLC NF adjoin other NFs, each of which have their own plans. The HLC NF is also intermixed with lands of other ownerships, including private lands, other federal lands, and state lands. Some adjacent lands are subject to their own resource management plans. The cumulative effects to recreation settings from these other resource management plans with the 2021 Land Management Plan are summarized in Table 136.

**Table 136. Summary of cumulative effects to recreation settings from other resource management plans**

<b>Resource plan</b>	<b>Description and summary of effects</b>
<b>Blackfoot Nation:</b> Wildland Fire Management Plan, (2018)	The Blackfoot Nation's Wildland Fire Management Plan is a strategic document that contains operational direction designed to guide a full range of fire management activities on a unit or area supported by land management plans. This plan provides direction for wildland fire only and does not provide direction for recreation settings on tribal lands.
<b>Bureau of Land Management (BLM)</b> Resource Management Plans	BLM lands near the HLC NF are managed by the Butte, Missoula, and Lewistown field offices. All three plans have undergone recent revisions. The direction in these plans is consistent with the 2021 Land Management Plan.
<b>Bureau of Reclamation (BOR)</b> Resource Management Plans, * Canyon Ferry RMP * Canyon Ferry Reservoir Shoreline RMP	These documents describe the measures the BOR will take toward the restoration and management of BOR lands surrounding the Canyon Ferry Reservoir. There is no specific discussion of recreation settings however, the effects of management to visual quality/scenery and providing appropriate recreation experiences is discussed. This direction is consistent with the 2021 Land Management Plan.
<b>City of Helena:</b> *Comprehensive Park Plan *Parks, Recreation, and Open Space Plan	The Parks, Recreation, and Open Space Plan (2010) includes goals and recommendations for open lands associated with the city which are immediately adjacent to NFS lands in the Divide GA. These measures are consistent with the 2021 Land Management Plan.
<b>County Growth Policies</b>	These plans are integrated documents that focus on growth management and economic development strategies. Recreation is addressed as an element in many of these plans. These plans are consistent with the 2021 Land Management Plan.
<b>County Wildfire Protection Plans</b>	The overall effect of the county plans would be to influence where treatments occur to contribute to desired vegetation conditions. Some county wildfire protection plans map and/or define the WUI. These documents do not address recreation management or settings.
<b>Forest Service:</b> Land Management Plans	The forest plans for NFS lands adjacent to the HLC NF include the Lolo, Flathead, and Beaverhead-Deerlodge NFs and Custer-Gallatin NFs. The Flathead NF plan was revised in 2018 and the Custer-Gallatin NF plan is undergoing revision at the time this report was prepared. These plans all address recreation settings and have assigned desired ROS. These plans are consistent with the direction in the 2021 Land Management Plan.
<b>Montana State - DNRC:</b> *Statewide Forest Resource Strategy *Habitat Conservation Plan *Water Plan	These plans guide resource management on state lands. They include many concepts that are consistent with the 2021 Land Management Plan.
<b>Montana State - FWP:</b> Conservation Management Plans *Wildlife Action Plan *Big Horn Sheep Conservation *Elk Management Plan *Fish Management Program	These conservation management plans provide specific direction for the management for wildlife and fish on Montana State lands. This direction is consistent with the 2021 Land Management Plan.
<b>Montana State – State Parks:</b> * Montana State Parks Strategic Plan (2020)	The MT State Parks Strategy provides guidance to the state park program and addresses a strategic framework to strengthen the park system in Montana. The SCORP is a Montana statewide comprehensive outdoor recreation plan that serves as a guiding document to promote integrated outdoor recreation management and service provision in a more holistic and effective manner.

Resource plan	Description and summary of effects
*Statewide Comprehensive Outdoor Recreation Plan (SCORP)	These documents are consistent with direction in the 2021 Land Management Plan.
<b>Montana State - MFAAC:</b> Montana Forest Action Advisory Council (MFAAC) (2020) *Assessment of Forest Condition *Forest Action Plan	These plans aim to take a seamless and coordinated cross-boundary approach to address the pressing concerns of forest health and wildfire risk across all lands in Montana. Recreation is mentioned in these plans and is consistent with the 2021 Land Management Plan.
<b>Montana Army National Guard:</b> Integrated Natural Resources Plan, Lime Hills Training Area	This natural resource management plan provides direction for the Lime Hills Training Area and was designed to support and accommodate military missions while providing for natural resource stewardship and management. The document focuses on native ecosystems, wildlife, fire, noxious weeds, livestock grazing, cultural resources, and road upgrades and maintenance. This document does not address recreation management or settings.
<b>National Park Service (NPS):</b> Glacier National Park, *General Management Plan (1999) *National Park Bear Mgmt. Plan	This management plan for Glacier National Park calls for preserving natural vegetation, landscapes, and disturbance processes. Management of recreation settings is described in 4 zones: visitor service, day use, rustic, and backcountry. While these zones do not directly mirror the ROS settings, they are consistent with the direction in the 2021 Land Management Plan.
<b>Natural Resources Conservation Service (NRCS),</b> Strategic Plans *MT Soil Health Strategy * MT Sage Grouse Initiative Strategy	These documents are not applicable to the recreation resource and do not describe recreation settings or management.

## Conclusions

Alternative A, the no-action alternative, would not move the HLC NF toward meeting the purpose and need of the 2021 Land Management Plan which is to provide a range of recreation opportunities using the ROS system to display the allocations. The ROS system would continue to be used as a tool for the management of recreation but would not provide maps tied directly to the Plan. Travel plans would continue to provide the direction for where motorized uses can and cannot occur, and future wilderness and other laws may determine where the various ROS settings may be located.

Alternatives B, C, D, E, and F each meet the purpose and need of the Plan by mapping desired ROS setting. All of the action alternatives would establish desired ROS settings that would provide overall guidance and set expectations for the recreation settings on the Forest. Desired ROS settings would aid the Forest in managing both existing and emerging recreation uses. Additionally, by establishing expected recreation settings early on, the public can clearly identify areas where their preferred recreation activity would be allowed. Setting clear expectations and identifying a spectrum of settings for recreation users is important to the long-term management of sustainable recreation on the Forest.

Table 137 describes the percent of each desired ROS setting by alternative. Since the 1986 Forest Plans do not establish a range of specific ROS setting in alternative A, a crosswalk of the existing ROS settings was developed to be used for comparison purposes when examining all of the alternatives together.

**Table 137. Acres and percents of forestwide ROS settings by alternative**

Alternative	ROS setting	Summer ROS acres	Summer ROS – percent of total NFS lands	Winter ROS - acres	Winter ROS – percent of total NFS lands
A	Primitive	758,504	26	740,469	26
	Semiprimitive nonmotorized	1,025,709	36	1,099,434	38
	Semiprimitive motorized	366,453	13	752,452	26
	Roaded natural	703,723	24	262,562	9
	Rural	28,838	1	28,310	1
	Urban	0	0	0	0
B	Primitive	846,114	29	841,599	29
	Semiprimitive nonmotorized	949,405	33	1,030,181	36
	Semiprimitive motorized	368,173	13	732,671	25
	Roaded Natural	690,554	24	250,344	9
	Rural	28,982	1	28,432	1
	Urban	0	0	0	0
C	Primitive	846,114	29	828,441	29
	Semiprimitive nonmotorized	946,465	33	1,048,041	36
	Semiprimitive motorized	368,173	13	727,904	25
	Roaded Natural	693,493	24	250,409	9
	Rural	28,982	1	28,432	1
	Urban	0	0	0	0
D	Primitive	1,232,947	43	1,219,100	42
	Semiprimitive nonmotorized	608,343	21	709,591	25
	Semiprimitive motorized	341,912	12	680,203	24
	Roaded Natural	672,774	23	247,574	9
	Rural	27,251	1	26,758	1
	Urban	0	0	0	0
E	Primitive	724,316	25	706,280	25
	Semiprimitive nonmotorized	1,050,936	36	1,129,525	39
	Semiprimitive motorized	246,639	9	338,208	12
	Roaded Natural	833,514	29	680,832	24
	Rural	27,822	1	28,381	1
	Urban	0	0	0	0
F	Primitive	1,034,715	36	1,017,244	35
	Semiprimitive nonmotorized	758,488	26	856,779	30
	Semiprimitive motorized	368,338	13	726,772	25
	Roaded Natural	694,704	24	253,980	9
	Rural	28,982	1	28,432	1
	Urban	0	0	0	0

## 3.17 Recreation Opportunities

### 3.17.1 Introduction

To address both the challenges and opportunities in recreation management, the FS strives to provide a set of recreation settings, opportunities, and benefits that are sustainable over time. Sustainable recreation is defined as the set of recreation settings and opportunities on the NF that are ecologically, economically, and socially sustainable for present and future generations.

#### Issues

Issues raised for recreation opportunities during the scoping period for the proposed action and/or comment period on the DEIS led to alternative development related to recreation access. See recreation access section.

#### Measurement indicators

Effects to recreation opportunities will be measured by the impact of the plan components on the overall management of developed and dispersed recreation across the forest.

#### Analysis area

The geographic scope of the analysis is the lands administered by the HLC NF. All lands within the forest boundary form the geographic scope for cumulative effects. The temporal scope is the life of the plan (approximately 15 years).

#### Changes between draft and final

There were minor wording changes to the plan components between the draft and final EIS. These changes are within the scope of draft EIS analysis.

### 3.17.2 Regulatory framework

Please see the regulatory framework for Recreation Settings.

### 3.17.3 Assumptions

Since adoption of the 1986 plans, recreation activities and where they occur within the planning area have changed. This analysis assumes that changes to recreational use patterns would occur naturally as a result of factors associated with recreation trends, advances in technology, aging population, aging infrastructure, and climatic changes.

### 3.17.4 Best available scientific information used

Please refer to the BASI description under the recreation settings section.

### 3.17.5 Affected environment

Sustainable recreation sites are generally managed on a continuum based on a development scale ranging from 1 to 5. Recreation sites with minimum to low or few site modifications are lower on the development scale (1-2) and are considered “dispersed” recreation sites. Recreation sites with higher site modification and infrastructure on the development scales (3-5) are considered “developed” recreation sites. Table 138 displays the development scale and provides a definition of each.

**Table 138. Recreation site development scales**

Development scale	Definition	Developed or dispersed
1	<i>Recreation sites with minimum site modification.</i> Rustic or rudimentary improvements designed for protection of the site rather than comfort of the users. Use of synthetic materials excluded. Minimum controls are subtle. No obvious regimentation. Spacing informal and extended to minimize contacts between users. Motorized access not provided or permitted.	Dispersed
2	<i>Recreation sites with little site modification.</i> Rustic or rudimentary improvements designed primarily for protection of the site rather than the comfort of the users. Use of synthetic materials avoided. Minimum controls are subtle. Little obvious regimentation. Spacing informal and extended to minimize contacts between users. Motorized access provided or permitted. Primary access over primitive roads. Interpretive services informal.	Dispersed
3	<i>Recreation sites with moderate modification.</i> Facilities about equal for protection of natural site and comfort of users. Contemporary/rustic design of improvements is usually based on use of native materials. Inconspicuous vehicular traffic controls usually provided. Roads may be hard surfaced, and trails formalized. Development density about three family units per acre. Primary access may be over high standard roads. Interpretive services informal, but generally direct.	Developed
4	<i>Recreation sites that are heavily modified.</i> Some facilities designed strictly for comfort and convenience of users. Luxury facilities not provided. Facility design may incorporate synthetic materials. Extensive use of artificial surfacing of roads and trails. Vehicular traffic control usually obvious. Primary access usually over paved roads. Development density about three to five family units per acre. Plant materials usually native. Interpretive services often formal or structured.	Developed
5	<i>Recreation sites with a high degree of site modification.</i> Facilities mostly designed for comfort and convenience of users and usually include flush toilets; may include showers, bathhouses, laundry facilities, and electrical hookups. Synthetic materials commonly used. Formal walks or surfaced trails. Regimentation of users is obvious. Access usually by high-speed highways. Development density about five or more family units per acre. Plant materials may be foreign to the environment. Formal interpretive services usually available. Designs formalized and architecture may be contemporary. Mowed lawns and clipped shrubs not unusual.	Developed

The health and resiliency of the HLC NF's natural resources are critical to the sustained delivery of their nature-based recreational settings and opportunities. Without healthy resilient landscapes and habitats, many of the recreation opportunities that have historically been enjoyed would not be sustainable. Obvious linkages exist between the types of activities being pursued and the presence and condition of the natural resources.

The HLC NF's recreation programs contribute to the economic sustainability of Central Montana's rural communities. Hunting is the primary reason visitors come to the Forest (U.S. Department of Agriculture, Forest Service, 2013). Both jobs and revenue directly and indirectly result from visitors traveling to the Forest. The remoteness of the Forest's recreational settings encourages visitors to stop and buy groceries, gas, and other supplies to support their off-highway vehicle, stock, backpacking, boating, and biking experiences before entering the Forest. More direct jobs and revenue are associated with the Forest's outfitter- guide operations, downhill ski areas, and visitors to the Lewis and Clark National Historic Trail Interpretive Center.

## Developed recreation

Developed recreation opportunities are located throughout the planning area but are primarily concentrated in the roaded natural and rural ROS settings. Developed recreation opportunities are located at specific locations or “sites” and have infrastructure or features that have been designed for health and safety and to facilitate visitor comfort. The types of features and infrastructure often offered at developed sites include developed roads and parking areas, toilets, tables, fire rings, water systems, interpretive signs, and/or fee stations. Depending upon the location and the type of opportunity offered, these developed sites may or may not have fees associated with them. All of these developed sites are FS operated and maintained. There are currently no developed recreation facilities operated by concessionaire within the HLC NF. Ski areas, which have considerable development and infrastructure, are developed recreation sites managed under recreation special use permit. See map in appendix A.

The most common developed sites within the planning area are campgrounds, picnic areas, trailheads, cabin and lookout rentals, ski areas (both Nordic and alpine), interpretation sites, fishing sites, and boating sites. Most of the developed recreation sites are located along main roads and travel ways. Water-based recreation sites are located adjacent to the lakes or rivers on which the activities take place.

The Lewis and Clark National Historic Trail Interpretive Center is also considered a developed recreation opportunity within the planning area and is located outside of the forest boundary in the community of Great Falls, Montana.

One of the most unique developed recreation opportunities offered within the planning area is the rental of a cabin or lookout. Currently, there are 17 cabins/lookouts available to rent within the planning area. These cabins range from being more rustic to those that have more modern conveniences. A number of these properties are also listed on the National Register for Historic Places. Table 139 displays the existing developed recreation site types currently managed by the HLC NF. These recreation opportunities are arranged by GA to show their distribution and location.



**Table 139. Existing developed recreation site types by GA**

Site type	Big Belts	Castles	Crazies	Divide	Elkhorns	Highwoods	Little Belts	Rocky Mtn Range	Snowies	Upper Blackfoot	Outside of GA	Total
Boating site	3	-	-		-	-	-	2	1	-	-	6
Campground	4	2	1	4	-	1	18	12	1	2	-	45
Group campground	1	-	-	2	-	-	1	-	1	1	-	6
Horse campground	-	-	-	-	-	-	1	4	-	1	-	6
Picnic site	3	-	-	2	-	-	1	1	1	-	-	8
Group Picnic site	2	-	-	2	-	-	1	-	-	1	-	6
Fishing site	1	-	-		-	-	1	-	-	-	-	2
Interpretive center	-	-	-	-	-	-	-	-	-	-	1	1
Interpretive site	5	-	-	3	-	-	4	-	-	1	2	15
Observation site	1	-	-	1	-	-		1	-	-	-	3
Cabin/lookout	4	-	-	2	2	-	6	2	1	1	-	18
Ski area alpine	-	-	-	-	-	-	1	1	-	-	-	2
Ski area nordic	1	-	-	1	-	-	1	-	-	-	-	3
Snow park (snowmobile)	1	-	-	3	-	-	3	-	-	-	-	7
Trailhead	22	-	-	8	12	1	9	13	2	17	-	84
Scenic byway interpretation	-	-	-	1	-	-	-	-	-	-	2	3
<b>Grand total</b>	<b>48</b>	<b>2</b>	<b>1</b>	<b>29</b>	<b>14</b>	<b>2</b>	<b>47</b>	<b>36</b>	<b>7</b>	<b>24</b>	<b>5</b>	<b>215</b>

## Dispersed recreation

Dispersed recreation includes the full suite of recreation opportunities that take place outside of developed recreation sites. Dispersed recreation activities generally do not have fees associated with them and little or no facilities such as toilets, tables, or garbage collection. Common dispersed recreation activities within the planning area include, but are not limited to, camping, hunting, fishing, hiking, off-highway vehicle use, rock climbing, mountain biking, wildlife viewing, photography, cross-country skiing, snowmobiling, snowshoeing, dog sledding, visiting historic sites, viewing scenery, driving for pleasure, and exploring. The majority of forest visitors come to the planning area to engage in dispersed recreation activities. Once on the Forest, over 57 percent of visitors participate in some type of dispersed recreation (U.S. Department of Agriculture, Forest Service, 2013).

Even though dispersed recreation activities happen across all ROS settings, most of the specific dispersed recreation sites (such as campsites) are typically concentrated in the Forest's roaded natural and semiprimitive motorized ROS settings.

### *Dispersed camping*

Dispersed camping is heaviest during the summer holidays (Memorial Day, Fourth of July, and Labor Day weekends) and during bow and general rifle hunting seasons. There are places within the planning area where minor site improvements have been installed to protect the resource and to reduce the useable area within dispersed sites. GAs such as the Little Belts and the Big Belts have a higher percentage and density of dispersed hunting camps than GAs such as the Elkhorns and the Highwoods that have special tag drawings and receive fewer hunters by comparison.

Another issue associated with dispersed recreation is the unauthorized creation by the public of new campsites, trails, and/or facilities within the general forest area. In 2009, USFS Region 1 began developing a standardized protocol for inventorying and monitoring resource conditions of dispersed recreation, concentrating on dispersed camping sites.

### *Dispersed day use activities*

Common dispersed day use recreation throughout the planning area includes hunting, driving for pleasure, viewing natural features, photography, bird watching, target shooting, fishing, cross-country skiing, dog sledding, snowshoeing, and others. These activities can happen with individual visitors or with groups of people and tend to occur primarily on the weekends over the course of the year.

In general, these dispersed activities have remained consistent in the past 10 years with a couple of exceptions. Snow shoeing has seen a slight increase with more users noticed on weekends. Recently, snowshoe trails were added to the Silvercrest Cross Country Ski area within the Little Belts GA to address this increased use. District personnel have also noted a slight increase in dog sledding activities. There has been an increase in the number of hunters during archery season, which has created a longer period of use at dispersed hunting camps but has also increased the amount of day use that is taking place across the planning area.

Areas of concentrated dispersed use have seen an increase in the amount and distribution of trash and resource damage to natural resources.

## **3.17.6 Environmental consequences**

### **Effects common to all alternatives**

In all alternatives, natural disturbances, recreation trends and use patterns, and emerging technologies would continue to influence the specific type, amount, and location of recreation opportunities across the Forest. Travel plans would continue to provide site-specific direction for where motorized recreational uses can take place. Dead and dying trees and other natural occurrences may impact the location and availability of some

areas for recreation use. The health and safety of the recreating public would continue to influence recreation management, particularly at developed recreation sites, where visitor use would be concentrated.

### Effects common to all action alternatives

The effects of the plan components developed for recreation opportunities would remain the same in all action alternatives. By providing the plan components outlined in Table 140, the HLC NF would meet the purpose and need of the 2021 Land Management Plan, ensuring that recreation opportunities are ecologically, economically, and socially sustainable for present and future generations.

**Table 140. Summary plan components for recreation opportunities (alternatives B-F)**

<b>Recreation opportunity plan components</b>	<b>Summary of plan components for recreation opportunities</b>
FW-REC-DC-01	This desired condition highlights the need to connect people to the natural and cultural/historic environments in which they recreate.
FW-REC-DC-02	This desired condition focuses on the need to contribute, by providing a variety of recreation opportunities, to the economic stability of the Central Montana area.
FW-REC-DC-03	This desired condition provides direction for the strategic placement of developed recreation sites and facilities to accommodate recreation uses and to protect the natural and cultural resources of the Forest.
FW-REC-DC-04	This desired condition focuses on the need to provide recreation facilities that have minimal impact to other forest resources.
FW-REC-DC-05	This desired condition recognizes cabin and lookout rentals as a valued and unique recreation opportunity on the Forest.
FW-REC-DC-06	Vegetation within developed recreation sites would be managed to ensure the health and resiliency of the trees and the health and safety of the public .
FW-REC-DC-07	This desired condition recognizes dispersed camping as a valued and unique recreation opportunity and provides direction for the long-term management of this recreation use.
FW-REC-DC-08	This desired condition states that environmental and cultural resources will be protected at dispersed recreation sites, using minimal facilities when necessary.
FW-REC-GO-01	This goal provides for the operation, maintenance, and delivery of recreation facilities and programs, and information, education, and visitor services while incorporating the support of partnerships and volunteer groups.
FW-REC-OBJ-01	This objective would improve dispersed recreation camping opportunities in areas that have seen damage to natural resources or have sanitation issues.
FW-REC-OBJ-02	This objective would rehabilitate or relocate facilities that are impacting surface or riparian resources.
FW-REC-OBJ-03	This objective would improve the accessibility of developed recreation sites and programs on the Forest.
FW-REC-OBJ-04	This objective would rehabilitate or refurbish facilities at developed recreation sites.
FW-REC-GDL-01	The guideline addresses the need to assess changes in the environment that may require changes in the location and availability of recreation opportunities.
FW-REC-GDL-02	This guideline acknowledges that vegetative management in areas where there is concentrated recreation uses should be done in an aesthetic manner and should be tied to the SIOs.
FW-REC-GDL-03	This guideline provides direction for the groundwater use developments associated with recreation opportunities in riparian areas on the Forest.
FW-REC-GDL-04	This guideline provides direction for the placement of new recreation facilities and infrastructure within expected long-term channel migration zone to reduce potential impacts to fishery resources.

Recreation opportunity plan components	Summary of plan components for recreation opportunities
FW-REC-GDL-05	This guideline provides direction for the potential removal of some recreation facilities from riparian areas.
FW-REC-GDL-06	This guideline provides direction for the placement of solid and sanitary waste facilities.
FW-REC-GDL-07	The guideline provides direction on managing roadside vegetation at developed recreation facilities to reduce bear-human conflicts.
FW-REC-GDL-08 FW-REC-GDL-09	These guidelines emphasize that recreation facilities, for both developed and dispersed recreation sites, should be consistent with desired ROS classes.
FW-REC-SUIT-01	Managing trees for timber production would not be suitable in developed recreation sites; however, trees may be cut down to address safety concerns or other resource concerns that would affect the recreating public.
FW-REC-SUIT-02	Developed recreation sites would not be suitable for saleable mineral activities, unless the material is used onsite for administrative purposes.
FW-REC-SUIT-03	Developed recreation sites that have been administratively withdrawn from mineral entry would not be available for leasable or locatable mineral activity.
FW-REC-SUIT-04	Developed recreation sites would be protected from the impacts that can be created by livestock grazing.

### *Accessibility for the Aging Public*

An issue brought forward during public scoping was the overall aging of the American public and the need for the FS to provide additional accessibility. The FS is required to meet all law and policy related to accessibility. Upgrades would be needed in at least five developed recreation sites to be consistent with the 2021 Land Management Plan. Please see FW-REC-OBJ-04.

Dispersed recreation sites are not required by law to meet accessibility standards. Neither is it policy or law to provide motorized access to areas that are closed to motorized recreation use in order to meet accessibility standards, except in wilderness where motorized wheelchair use is permitted according to the Americans with Disabilities Act of 1990 (Public Law 101-336).

### *Effects from forest plan components associated with:*

#### **Aquatic ecosystems and soil management**

Plan components and activities related to watershed, soil, riparian, or aquatic habitat improvements would have effects on developed and dispersed recreation opportunities on the HLC NF. The plan components that would have the greatest influence on recreation opportunities under the action alternatives are those associated with RMZs. East of the Continental Divide (the majority of the HLC NF), RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. West of the Continental Divide, the area influenced by riparian plan components would be similar across all alternatives because RMZs widths are like riparian habitat conservation areas in the no-action alternative.

Many developed and dispersed recreation sites are in RMZs and near water sources across the forest. Aquatic and soil management activities may have an impact on developed and dispersed recreation. Existing recreation sites may be hardened with gravel to reduce impacts to bare soil and/or areas may be confined with parking barrier to keep the recreation public out of sensitive resource areas. New construction of developed recreation sites, including considerations for outhouse location and water systems, would need to meet more stringent requirements. Vegetation management that may occur within recreation areas would also need to meet RMZ plan components. Where possible, recreation sites and facilities would be located outside of RMZs. Plan components in the Plan encourage the removal or relocation of recreation facilities that are currently within RMZs if they are degrading aquatic or riparian resources.

In summary, all action alternatives provide direction and guidance for the management of recreation opportunities to protect watershed, soil, riparian and aquatic habitats, most specifically within RMZs. The area on which these components apply would be greater with the action alternatives than with the no-action alternative on landscapes east of the Continental Divide. These components may limit or restrict the development of certain recreation opportunities or facilities within RMZs, and over time may decrease the number of recreation facilities found in those areas.

### **Fire and fuels management**

Unplanned and prescribed fires would continue to affect the long-term ecological processes across recreation settings and may impact the location and availability of recreation opportunities on the Forest. Fire could create a temporary loss of vegetation, reduction in water quality due to sedimentation, reduction in recreation access to some recreation opportunities, and air pollution which could cause displacement of some forest visitors to other areas on the forest or to other forests in the region. All action alternatives include plan components that support the use of unplanned and prescribed fires as natural ecosystem processes that can move the landscape towards desired conditions. However, all action alternatives also include plan components that ensure air quality regulations would be met with respect to prescribed fire which may ameliorate the displacement of forest visitors to some degree.

### **Timber and vegetation management**

Timber management would continue on lands suitable for timber production as well as unsuitable lands where harvest may occur to achieve other multiple use values. These activities may be noticeable from within developed recreation sites. Additionally, dispersed recreation sites may be located within or very near timber harvest units which may create concerns about health and safety and may cause visitors to relocate until activities are complete.

### **Livestock grazing and management**

Generally, the grazing of livestock is not allowed within developed recreation sites and many developed recreation sites are surrounded by fencing to ensure grazing occurs outside of these areas. However, grazing is more common within or near dispersed recreation sites where fences are less common and where there are fewer constructed recreation features. The action alternatives provide suitability direction for the management of grazing within developed recreation sites.

### **Wildlife habitat management**

Activities related to wildlife habitat improvements and management would affect recreation opportunities across the HLC NF. Forest users would be required to adhere to food storage requirements in the PCA, Zone 1 and Zone 2. Increases in the number and capacity of developed recreation sites in the PCA would be limited. Within the PCA and Zone 1 the density of motorized access routes would not be allowed to increase above the established baseline, which could affect the potential for motorized recreation in those areas in the future. Plan components for management of lynx habitat could impact some types of recreation opportunities. Big game habitat management could also affect the timing or type of motorized recreation opportunities in some areas.

### **Cultural, historic, and tribal resource management**

There are many historic lookouts and cabins across the HLC NF that are rented and used for recreational purposes. These sites contribute to the variety of developed recreation opportunities offered on the Forest. Future expansion of the lookout and cabin rental program may include additional historic structures.

Additionally, many existing developed and dispersed sites are located on or near landscapes that have cultural significance on the Forest. Expansion of developed sites or development of dispersed sites may impact these cultural/historic landscapes.

All action alternatives provide plan components that would protect and enhance these cultural and historic resource values.

**Road access and infrastructure**

Most developed and dispersed recreation sites are accessed from open roads and trails. Infrastructure, usually buildings, site furniture, and water systems, is generally found at the most developed recreation sites. Deferred maintenance has been an issue as facilities and recreation sites age. Travel plans establish where motorized use can or cannot take place and support and help maintain ROS settings for both summer and winter.

All action alternatives developed plan components that provide future direction for road access and the construction/reconstruction and maintenance of infrastructure across the Forest.

**Minerals management**

Areas with active mining may impact the recreation settings of the area immediately surrounding the mining area. The action alternatives provide suitability direction for the management of saleable mineral activities within developed recreation sites.

**Alternative A, no action**

In the no-action alternative, recreation opportunities would continue to be managed under the 1986 Helena and Lewis and Clark Forest Plans. Both plans provide direction for developed recreation and motorized and nonmotorized dispersed recreation. Additionally, the 1986 plans provide very limited direction for the management of cabin and lookout rentals, and there is no direction for the management of the Lewis and Clark National Historic Trail Interpretive Center.

In alternative A, travel plans would continue to provide the direction for where motorized uses can occur, and wilderness and other laws may determine where various recreation facilities and opportunities occur. Table 141 displays the plan components in the 1986 plans that provide direction for recreation opportunities on the HLC NF.

**Table 141. Summary of existing 1986 plan components for recreation opportunities**

Plan component	Summary of 1986 plan components for recreation opportunities
1986 Helena NF Plan; Forest-wide Management Direction, Goals 1 and 2, Page II/1.	These plan components provide for a range of outdoor recreation opportunities, including motorized and nonmotorized opportunities.
1986 Helena NF Plan; Objectives, Resource Activity/Summaries; Recreation, Page II/2.	These objectives emphasize using Recreation Opportunity Guides to communicate recreation opportunities to the public. It also speaks to emphasizing dispersed recreation opportunities, including both motorized and nonmotorized opportunities. This objective also encourages the use of partnerships with private, State and other federal agencies to provide recreation opportunities and to close, eliminate, or relocate recreation opportunities that are no longer needed or no longer cost efficient.
1986 Helena NF Plan, Forest-wide Standards, Recreation 1, 3, and 5, Page II/14 through II/15.	<u>Recreation Standard 1:</u> This standard aims to maintain existing developed sites while encouraging dispersed recreation opportunities. New developed recreation facilities shall generally not be constructed, and removal of some developed recreation sites may be necessary to meet other recreation needs. <u>Recreation Standard 3:</u> Recreation opportunity guides were developed that described the primary recreation opportunities on each ranger district. <u>Recreation Standard 5:</u> The “Pack-in Pack-out” policy is emphasized in dispersed recreation and wilderness areas.
1986 Helena NF Plan, Management Areas, Pages III/3 through III/92.	Each of the management areas provides direction for recreation opportunities.
1986 Lewis and Clark NF Plan Forest-wide Objectives, Resource Activity Summaries, Recreation; Page 2-4.	This objective emphasizes using Recreation Opportunity Guides to communicate recreation opportunities to the public. Dispersed recreation opportunities would be emphasized. “Pack-in Pack-out” would be encouraged.

Plan component	Summary of 1986 plan components for recreation opportunities
	An increase in winter trails programs, winter cabin rentals, camping, picnicking, and other developed site opportunities are expected.
1986 Lewis and Clark NF Plan, Forest-wide Standards, A-1, A-2, and A-5, Pages 2-25 through 2-26.	<u>A-1 Recreation Information</u> : Use recreation opportunity guides to describe the primary recreation opportunities on each ranger district. <u>A-2 Developed Recreation</u> : Provides guidance for developed recreation opportunities. <u>A-5 Winter Dispersed Recreation Opportunities</u> : Provides direction for both motorized and nonmotorized winter snow trails.
1986 Lewis and Clark NF Plan Management Areas, Pages 3-3 through 3-104.	Each of the MAs provides general direction for recreation opportunities.

**Alternatives B – F**

See effects common to all action alternatives, above.

**Cumulative Effects**

There are a wide variety of recreation opportunities in the central Montana area and the HLC NF contributes substantially to those opportunities. In addition to the recreation experiences that the HLC NF offers, other recreation opportunities exist on lands managed by MFWP, the BLM, the National Park Service, and private lands. Coordination with other agencies and organizations to provide recreation opportunities would continue to be necessary to meet public demands. Some adjacent lands are subject to their own resource management plans. The cumulative effects to recreation opportunities from these other resource management plans with the 2021 Land Management Plan are summarized in Table 142.

**Table 142. Summary of cumulative effects to recreation opportunities from other resource management plans**

Resource plan	Description and summary of effects
Blackfeet Nation: Wildland Fire Management Plan, (2018)	The Blackfeet Nation’s Wildland Fire Management Plan is a strategic document that contains operational direction designed to guide a full range of fire management activities on a unit or area supported by land management plans. This plan provides direction for wildland fire only and does not provide direction for recreation on tribal lands.
Bureau of Land Management (BLM) Resource Management Plans	BLM lands near the HLC NF are managed by the Butte, Missoula, and Lewistown field offices. All three plans have undergone recent revisions. The direction in these plans is consistent with the 2021 Land Management Plan.
Bureau of Reclamation (BOR) Resource Management Plans, * Canyon Ferry RMP * Canyon Ferry Reservoir Shoreline RMP	These documents describe the measures the BOR will take toward the restoration and management of BOR lands surrounding the Canyon Ferry Reservoir. The effects of management to visual quality/scenery and providing appropriate recreation experiences and opportunities is discussed. This direction is consistent with the 2021 Land Management Plan.
City of Helena: *Comprehensive Park Plan *Parks, Recreation, and Open Space Plan	The Parks, Recreation, and Open Space Plan (2010) includes goals and recommendations for open lands associated with the city which are immediately adjacent to NFS lands in the Divide GA. These measures complement the direction in the 2021 Land Management Plan.
County Growth Policies	These plans are integrated documents that focus on growth management and economic development strategies. Recreation is addressed as an element of these plans and bordering of National Forest lands is often mentioned. These plans are consistent with the 2021 Land Management Plan.
County Wildfire Protection Plans	The overall effect of the county plans would be to influence where treatments occur to contribute to desired vegetation conditions. Some county wildfire protection plans map and/or define the WUI. These documents do not address the management of recreation opportunities.

Resource plan	Description and summary of effects
Forest Service: Land Management Plans	The forest plans for NFS lands adjacent to the HLC NF include the Lolo, Flathead, Beaverhead-Deerlodge NFs and Custer-Gallatin NFs. The Flathead NF plan was revised in 2018 and the Custer-Gallatin NF plan is undergoing revision at the time this report was prepared. These plans address recreation opportunities and have forest plan components consistent with the direction in the 2021 Land Management Plan.
Montana State - DNRC: *Statewide Forest Resource Strategy *Habitat Conservation Plan *Water Plan	These plans guide resource management on state lands. They include many concepts that are consistent with the 2021 Land Management Plan.
Montana State - FWP: Conservation Management Plans *Wildlife Action Plan *Big Horn Sheep Conservation *Elk Management Plan *Fish Management Program	These conservation management plans provide specific direction for the management for wildlife and fish on Montana State lands. This direction is consistent with the 2021 Land Management Plan.
Montana State – State Parks: * Montana State Parks Strategic Plan (2020) *Statewide Comprehensive Outdoor Recreation Plan (SCORP)	The MT State Parks Strategy provides guidance to the state park program and addresses a strategic framework to strengthen the park system in Montana. The SCORP is a Montana statewide comprehensive outdoor recreation plan that serves as a guiding document to promote integrated outdoor recreation management and service provision in a more holistic and effective manner. These documents are consistent with direction in the 2021 Land Management Plan.
Montana State - MFAAC: Montana Forest Action Advisory Council (MFAAC) (2020) *Assessment of Forest Condition *Forest Action Plan	These plans aim to take a seamless and coordinated cross-boundary approach to address the pressing concerns of forest health and wildfire risk across all lands in Montana. Recreation is mentioned in these plans and is consistent with the 2021 Land Management Plan.
Montana Army National Guard: Integrated Natural Resources Plan, Lime Hills Training Area	This natural resource management plan provides direction for the Lime Hills Training Area and was designed to support and accommodate military missions while providing for natural resource stewardship and management. The document focuses on native ecosystems, wildlife, fire, noxious weeds, livestock grazing, cultural resources, and road upgrades and maintenance. This document does not address recreation management or opportunities.
National Park Service (NPS): Glacier National Park, *General Management Plan (1999) *National Park Bear Mgmt. Plan	This management plan for Glacier National Park calls for preserving natural vegetation, landscapes, and disturbance processes. Management of recreation settings is described in 4 zones: visitor service, day use, rustic, and backcountry. Recreation opportunities within these zones is consistent with the 2021 Land Management Plan. Recreation opportunities are not mentioned in the Bear Management Plan.
Natural Resources Conservation Service (NRCS): Strategic Plans *MT Soil Health Strategy * MT Sage Grouse Initiative Strategy	These documents are not applicable to the recreation resource and do not describe recreation opportunities or management.



## Conclusions

The specific number and kind of developed recreation facilities and the number of dispersed recreation sites would not vary in any of the alternatives, including alternative A. However, the action alternatives (alternatives B-F) would include plan components that would provide additional direction for the construction of new recreation sites in riparian areas, the development of future water supplies, the management of dispersed recreation, and the management of cabin and lookout rentals.

By providing the plan components outlined in the action alternatives, the HLC NF would meet the purpose and need of the Plan, ensuring that recreation opportunities are ecologically, economically, and socially sustainable for present and future generations.

## 3.18 Recreation Special Uses

### 3.18.1 Introduction

Recreation special use permits provide for occupancy and use of the NF through issuance of permits. Permitted recreation uses provide specific recreational opportunities to the public and deliver economic benefits to rural economics.

#### Issues

During the scoping period on the proposed action and comment period for the DEIS, the public expressed concern that the Plan does not set limits for number and kind of outfitter and guide special use permits. Setting limits for the number and kinds of special use authorizations is not required by the 2012 Planning Rule. An alternative to establish limits for outfitter and guide special use permits was considered but not in detail. Please see section 2.7.9.

#### Measurement indicators

Effects to recreation special uses will be measured by the impact of the plan components on the overall management of recreation special uses across the forest.

#### Analysis area

The geographic scope of the analysis is the lands administered by the HLC NF. All lands within the forest boundary form the geographic scope for cumulative effects. The temporal scope is the life of the plan (approximately 15 years).

#### Changes between draft and final

There were minor wording changes to the plan components between the draft and final EIS. These changes are within the scope of DEIS analysis.

### 3.18.2 Regulatory framework

Please see the regulatory framework for Recreation Settings.

### 3.18.3 Assumptions

Since adoption of the 1986 plans, recreation activities within the planning area have changed. This analysis assumes that changes to recreational use patterns would occur naturally as a result of factors associated with recreation trends, advances in technology, aging population, aging infrastructure, and climatic changes.

### 3.18.4 Best available scientific information used

Please refer to the BASI description under the recreation settings section.

### 3.18.5 Affected environment

Recreation special use permits provide for occupancy and use of national forests through issuance of permits. Permitted recreation uses provide specific recreational opportunities to the public and deliver economic benefits to rural economics. There are both commercial and noncommercial recreation special use permits. Commercial special use permits include opportunities such as ski resorts, outfitter and guiding services, lodging resorts, and organizational camps. Noncommercial special use permits are used by individuals and single families, such as permits issued for recreation residences.

The HLC NF has both commercial and noncommercial recreation permits. Table 143 gives a summary of the number and kinds of recreation special use permits currently managed by the HLC NF.

**Table 143. Summary of recreation special uses permits by GA**

GA	Recreation Residences	Organization Camps	Resorts	Ski Areas	Outfitter and Guides
Big Belts	-	-	-	-	4
Castles	1	-	-	-	1
Crazies	-	-	-	-	2
Divide	11	1	-	-	1
Elkhorns	-	-	-	-	1
Highwoods	3	-	-	-	-
Little Belts	58	1	-	1	21
Rocky Mountain Range	98	-	4	1	19
Snowies	-	-	-	-	1
Upper Blackfoot	1	-	-	-	7
<b>Totals</b>	<b>172</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>57</b>

### Recreation special events

The HLC NF also provides recreation special use permits for recreation special events on the Forest (Table 144). Special event permits are issued to groups or organizations for events that are short-lived or temporary in nature.

**Table 144. Number of recreation special use permits issued for special events by ranger district from 2014 through 2018**

Ranger District	2014	2015	2016	2017	2018
Helena	4	1	5	4	2
Lincoln	4	2	5	4	3
Townsend	0	0	1	0	0
Belt Creek-White Sulphur Springs	1	5	6	2	7
Judith-Musselshell	2	3	3	3	2
Rocky Mountain	0	0	0	0	0

### 3.18.6 Environmental consequences

#### Effects common to all alternatives

In all alternatives, natural disturbances, recreation use patterns, and emerging technologies would continue to influence the need for recreation special use permits across the Forest. Vegetative conditions can seriously impact the location and infrastructure of recreation special uses. Additionally, the condition of aging infrastructure can have both long and short-term effects to permit holders. Emerging technologies as well as shifts and changes in recreational interests can influence the kinds and location of special uses on the landscape.

#### Effects common to all action alternatives

Plan components developed for recreation special uses would remain the same in all action alternatives and provide general guidance for recreation special uses. Specific guidance regarding individual permits would remain a part of the permit process. Direction for overall forest capacity and needs assessments would occur outside of the forest planning process. The Plan would not set limits on number and kind of special uses provided on the HLC NF in any of the action alternatives.

Table 145 summarizes the plan components for recreation special use permits. The collective effect of these plan components would be the establishment of management direction for a sustainable recreation special uses program on the forest.

**Table 145. Summary of plan components for recreation special use permits**

Recreation special use permit plan component	Summary of plan components for recreation special use permits
FW-RSUP-DC-01	Recreation special uses would provide unique opportunities, services, and experiences depending upon a demonstrated demand for a specific recreation opportunity.
FW-RSUP-DC-02	Recreation special uses would provide services while ensuring public health and safety and the protection of natural and cultural resources.
FW-RSUP-DC-03	This desired condition recognizes that recreation special uses contribute to the local economy and must remain compatible with ecological and social capacity thresholds.
FW-RSUP-DC-04	This desired condition highlights the historic values of buildings under special use permit while providing for permitted uses to occur.
FW-RSUP-DC-05	Vegetative management would be used to provide for public health and safety and the protection of permitted uses and facilities.
FW-RSUP-GDL-01	This guideline provides direction for the development of permits that reduce conflict with other users and natural resources.

#### *Limiting number and kind of outfitter and guide special use permits*

During the scoping period for the proposed action and comment period for the DEIS, the public expressed concern that the Plan does not set limits for number and kind of outfitter and guide special use permits. The 2012 Planning Rule requires that forest plans provide overall direction for the general management of special uses on the forest. Establishing specifics regarding setting the capacity for the number and kinds of special use authorizations on the forest would occur outside of the forest planning process so that needs and capacity can be addressed as conditions change across the forest and was not considered in alternative development for the FEIS.

### *Effects from 2021 Land Management Plan Components Associated With:*

#### **Aquatic ecosystems and soil management**

Plan components and activities related to watershed, soil, riparian, or aquatic habitat improvements would have effects to some recreation special use permits. The plan components that would have the greatest influence on recreation opportunities under all action alternatives are those associated with RMZs. East of the Continental Divide (the majority of the HLC NF), RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. West of the Continental Divide, the area influenced by riparian plan components is the same across all alternatives because RMZs would be defined the same way as riparian habitat conservation zones are in the no-action alternative. Please refer to the RMZ section.

Many special use permits require access to areas located within RMZs and near sources of water. Where possible recreation special uses would be located outside of RMZs. Aquatic and soil management activities may have an impact on recreation special uses. Existing recreation special uses locations may be hardened with gravel to reduce impacts to bare soil and/or areas may be confined with parking barrier to keep the recreation public out of sensitive resource areas. New construction of developed recreation sites where recreation special uses take place, including considerations for outhouse location and water systems, would need to meet more stringent requirements. Vegetation management that may occur within recreation special uses areas would also need to meet RMZ plan components. Plan components for RMZs would limit road construction and vegetation management activities that could occur in association with special use permits.

All action alternatives provide direction and guidance for the management of recreation special uses to protect watershed, soil, riparian and aquatic habitats, most specifically within RMZs. The area on which these components apply is greater with the action alternatives than with the no-action alternative on landscapes east of the Continental Divide. These components may limit or restrict the development of certain recreation opportunities or facilities within RMZs, and over time may decrease the number of recreation facilities found in those areas.

#### **Fire and fuels management**

Unplanned and prescribed fires would continue to affect the long-term ecological processes across the HLC NF. Fire could create a temporary loss of vegetation, reduction in water quality due to sedimentation, reduction in recreation access to some areas, and air pollution which could cause displacement of some forest visitors to other areas on the forest or to other forests in the region. All action alternatives include plan components that support the use of unplanned and prescribed fires as natural ecosystem processes that can move the landscape towards desired conditions. However, all action alternatives also include plan components that ensure air quality regulations would be met with respect to prescribed fire which may ameliorate the displacement of forest visitors to some degree.

#### **Timber and vegetation management**

Timber and vegetation management activities would occur on lands suitable for timber production as well as unsuitable lands where harvest may occur to achieve other multiple use values. These activities may be noticeable from areas where recreation special uses area taking place. In some cases, such as downhill ski permit areas, vegetation management is an effective tool for creating additional opportunities and/or protecting forest visitors (i.e. hazard tree removal on ski runs). All action alternative includes plan components for the management of vegetation around developed recreation sites and permanent structures associated with recreation special uses.

#### **Livestock grazing and management**

Generally, the grazing of livestock associated with recreation special uses is allowed within areas associated with the recreation special use permits. The action alternatives provide suitability direction for the management of grazing within developed recreation sites and associated with recreation special uses.

**Wildlife habitat management**

Activities related to wildlife habitat improvements and management would affect recreation special use opportunities across the HLC NF. Forest users would be required to adhere to food storage requirements in the PCA, Zone 1 and Zone 2. Increases in the number and capacity of developed recreation sites in the PCA would be limited. Plan components for management of lynx habitat could impact some types of recreation special use opportunities. Big game habitat management could also affect the timing or type of motorized recreation special use opportunities in some areas.

**Cultural, historic, and tribal resource management**

Many of the recreation residences and resorts on the HLC NF are historic and have a need to be managed for their historic values in addition to their recreational values. Future expansion and remodeling of these requires additional planning and approval to ensure that historic values are not damaged. All action alternatives provide plan components that would protect and enhance the historic resource values associated with recreation special use permits.

**Road access and infrastructure**

All action alternatives developed plan components that provide future direction for road access and the construction/reconstruction and maintenance of historic buildings and infrastructure associated with recreation special use permits on the Forest.

**Alternative A, no action**

In the no-action alternative, recreation special uses would continue to be managed under the guidance provided in the 1986 Helena and Lewis and Clark Forest Plans. See Table 146.

**Table 146. Summary of existing 1986 plan components for recreation special uses**

Plan component	Summary of 1986 plan components for recreation special use permits
1986 Helena NF Plan, Forest-wide Standards, Recreation (7) Page II/15.	“Outfitter and guide use will generally be maintained at a level determined from the highest of 2 years of actual use experienced during the period 1979-1983. Applications for new special use permits will be considered on a case-by-case basis with consideration for resource limitation and public need.” This standard provides specific direction for the management of the special uses program. It also does not allow for new or additional information on recreation special uses beyond the year 1983 and may not be including the variety of special use requests that the HLC NF currently receives.
1986 Helena NF Plan, appendix O, Pages O/1 and O/2.	Provides guidance for special uses and subdivisions including: “occasional” events, commercial recreation developments, and recreation cabins on the forest. This appendix does not include direction for all recreation special uses on the forest and leaves forest managers flexibility for determining the needs of permits on case-by-case basis.
1986 Lewis and Clark NF Plan, Forest-wide Objectives, Resource/Activity Summaries Recreation, Page 2-4.	“Recreation residence permits will be continued except where there are substantial conflicts with public needs or resources values.” This objective does not provide guidance for the special needs of historic values of recreation residences. Additionally, there are no objectives for other recreation special use permits.
1986 Lewis and Clark NF Plan, Forest-wide Standards, Recreation Residences A-3, Travel Shelters A-4, Winter Dispersed Recreation A-5, Land Uses J-3 (3) and (7) Pages 2-26 and 2-62.	These standards provide direction for recreation residences, travel shelters, and winter dispersed recreation opportunities. Specifically, Standard A-3 outlines the use of FSM 2720 for the administration of recreation residence permits. Standard A-4 authorizes the use of permits to developing travel shelters. Standard A-5 encourages cooperative agreements for motorized and nonmotorized winter snow trails.  Standard J-3 provides direction for a number of kinds of special uses. Relevant to recreation, (3) states that special uses will be provided to support Forest goals and objectives and (7) provides direction to maintain

Plan component	Summary of 1986 plan components for recreation special use permits
	the number of outfitter-guide permits to the 1984 level, but to consider new outfitter-guide permits on a case-by-case basis.

**Alternatives B – F**

See effects common to all action alternatives.

**Cumulative Effects**

There are a wide variety of recreation special use opportunities in the central Montana area and the HLC NF contributes substantially to those opportunities. In addition to the recreation experiences that the HLC NF offers, other recreation special use opportunities exist on lands managed by MFWP, the BLM, and the National Park Service. Coordination with other agencies and organizations to provide recreation special uses would continue to be necessary to meet public demands. Some adjacent lands are subject to their own resource management plans. The cumulative effects to recreation special uses from these other resource management plans with the 2021 Land Management Plan are summarized in Table 147.

**Table 147. Summary of cumulative effects to recreation special uses from other resource management plans**

Resource plan	Description and summary of effects
Blackfeet Nation: Wildland Fire Management Plan, (2018)	The Blackfeet Nation’s Wildland Fire Management Plan is a strategic document that contains operational direction designed to guide a full range of fire management activities on a unit or area supported by land management plans. This plan provides direction for wildland fire only and does not provide direction for recreation special uses on tribal lands.
Bureau of Land Management (BLM): Resource Management Plans	BLM lands near the HLC NF are managed by the Butte, Missoula, and Lewistown field offices. All three plans have undergone recent revisions. These documents do not address recreation special uses.
Bureau of Reclamation (BOR): Resource Management Plans, * Canyon Ferry RMP * Canyon Ferry Reservoir Shoreline RMP	These documents describe the measures the BOR will take toward the restoration and management of BOR lands surrounding the Canyon Ferry Reservoir. These plans do not address recreation special uses.
City of Helena: *Comprehensive Park Plan *Parks, Recreation, and Open Space Plan	The Parks, Recreation, and Open Space Plan (2010) includes goals and recommendations for open lands associated with the city which are immediately adjacent to NFS lands in the Divide GA. The plans do not address recreation special uses.
County Growth Policies	These plans are integrated documents that focus on growth management and economic development strategies. These plans do not address recreation special uses.
County Wildfire Protection Plans	The overall effect of the county plans would be to influence where treatments occur to contribute to desired vegetation conditions. Some county wildfire protection plans map and/or define the WUI. These plans do not address recreation special uses.
Forest Service: Land Management Plans	The forest plans for NFS lands adjacent to the HLC NF include the Lolo, Flathead, Beaverhead-Deerlodge NFs and Custer-Gallatin NFs. The Flathead NF plan was revised in 2018 and the Custer-Gallatin NF plan is undergoing revision at the time this report was prepared. These plans address recreation special uses and have forest plan components consistent with the direction in the 2021 Land Management Plan.
Montana State - DNRC:	These plans guide resource management on state lands. They include many concepts that are consistent with the 2021 Land Management Plan.

Resource plan	Description and summary of effects
*Statewide Forest Resource Strategy *Habitat Conservation Plan *Water Plan	
Montana State - FWP: Conservation Management Plans *Wildlife Action Plan *Big Horn Sheep Conservation *Elk Management Plan *Fish Management Program	These conservation management plans provide specific direction for the management for wildlife and fish on Montana State lands. Recreation special uses are not mentioned in these plans.
Montana State – State Parks: * Montana State Parks Strategic Plan (2020) *Statewide Comprehensive Outdoor Recreation Plan (SCORP)	The MT State Parks Strategy provides guidance to the state park program and addresses a strategic framework to strengthen the park system in Montana. The SCORP is a Montana statewide comprehensive outdoor recreation plan that serves as a guiding document to promote integrated outdoor recreation management and service provision in a more holistic and effective manner. These documents do not address recreation special uses.
Montana State - MFAAC: Montana Forest Action Advisory Council (MFAAC) (2020) *Assessment of Forest Condition *Forest Action Plan	These plans aim to take a seamless and coordinated cross-boundary approach to address the pressing concerns of forest health and wildfire risk across all lands in Montana. Recreation special uses are not mentioned in these plans.
Montana Army National Guard: Integrated Natural Resources Plan, Lime Hills Training Area	This natural resource management plan provides direction for the Lime Hills Training Area and was designed to support and accommodate military missions while providing for natural resource stewardship and management. The document focuses on native ecosystems, wildlife, fire, noxious weeds, livestock grazing, cultural resources, and road upgrades and maintenance. Military training in the lime hills is authorized by the Forest Service through a special use permit. However, this plan does not specifically address that permit or other recreation special uses in the area.
National Park Service (NPS): Glacier National Park, *General Management Plan (1999) *National Park Bear Mgmt. Plan	This management plan for Glacier National Park calls for preserving natural vegetation, landscapes, and disturbance processes. Management of recreation settings is described in 4 zones: visitor service, day use, rustic, and backcountry. Recreation opportunities within these zones is described. Recreation special uses may be provided in the visitor services zone and is consistent with the 2021 Land Management Plan. There is no mention of recreation special uses in the Bear Management Plan.
Natural Resources Conservation Service (NRCS): Strategic Plans *MT Soil Health Strategy * MT Sage Grouse Initiative Strategy	These plans do not address recreation special uses.

### Conclusions

In alternative A, the special uses program would continue to be managed by the direction provided in the 1986 Helena and Lewis and Clark Forest Plans. Direction in the 1986 Forest Plans focuses primarily on recreation residents and outfitter and guides and does not provide guidance for other recreation special uses such as ski areas, resorts, organization camps, or special events.

Under the action alternatives, the plan components would provide overall direction for the management of all recreation special uses across the HLC NF. Specific guidance regarding individualized permits would remain a

part of the permit process. To be responsive to the frequent changes and flexible in the overall management of the recreation special uses program, direction for overall forest capacity and needs assessments would occur outside of the forest planning process.

By providing the plan components outlined in the action alternatives, the HLC NF would meet the purpose and need of the Plan, ensuring that recreation special uses are ecologically, economically, and socially sustainable for present and future generations.

## 3.19 Recreation Access

### 3.19.1 Introduction

Access to and through the forest is facilitated year-round, and in a number of ways. Visitors select their access based on their preferred setting, experience, and mode of transportation. Roads, motorized trails, nonmotorized trails, rivers, and airstrips penetrate the forest for visitors to walk, bike, boat, ride, drive, or fly to their destinations.

#### Issues

A number of issues regarding recreation access were raised during the scoping period for the proposed action and the comment period for the DEIS. The issues that drove alternatives for recreation access were:

- Suitability of motorized and mechanized means of transportation (mountain bikes) within RWAs.
- Suitability of mechanized means of transportation (mountain bikes) within the core of the Elkhorns and the Big Snowy Mountains.
- Suitability of mechanized means of transportation (mountain bikes) within primitive ROS areas outside of RWAs.
- Suitability of mechanized means of transportation (mountain bikes) within IRA's in the South Hills Recreation Area.

#### Measurement indicators

Effects to recreation access resulting from the alternatives were measured by whether or not they were found suitable for motorized recreation use or mechanized means of transportation:

- Within RWAs
- Within the core area of the Elkhorns
- Within the Big Snowies WSA

#### Analysis area

The geographic scope of the analysis is the lands administered by the HLC NF. All lands within the forest boundary form the geographic scope for cumulative effects. The temporal scope is the life of the plan (approximately 15 years).

#### Changes between draft and final

A number of changes to recreation access were made for the FEIS; however, all changes are within the scope of the DEIS analysis:

- There were minor wording changes to the recreation access plan components in the FEIS.
- There were several minor mapping changes due to more accurate information and data.
- Analysis for alternative F was added in the FEIS. In alternative F, recreation access via mechanized means of transportation (including mountain bikes), would be suitable in primitive



settings outside of identified RWAs. (Deep Creek, Tenderfoot Creek, Elkhorns core area, Badger Two Medicine, Grandview Recreation Area in the Snowies)

- Potential direct effects were moved from the primary analysis in the FEIS and placed in appendix K.

### 3.19.2 Assumptions

Since adoption of the 1986 plans, recreation activities in the planning area have changed. This analysis assumes that changes to recreational use patterns would occur naturally as a result of factors associated with recreation trends, advances in technology, aging population, aging infrastructure, and climate changes.

### 3.19.3 Regulatory framework

Please see the regulatory framework for Recreation Settings.

### 3.19.4 Best available scientific information used

Please refer to the BASI description under the recreation settings section. All road and trail miles are derived from the Infrastructure database and are approximate.

### 3.19.5 Affected environment

Recreation access to and through the HLC NF is facilitated year-round most commonly by roads, trails, waterways, and airstrips. Forest access, through roads and trails, links local communities with forest settings and facilitates backyard recreation opportunities. In some cases, travel routes are recognized by unique designations, such as the Kings Hill scenic byway, the Continental Divide National Scenic Trail, and the Lewis and Clark National Historic Trail.

Most often, main access to the National Forest is provided via public roads and right of ways and through easements with private land holders. Once on forest, direction for recreation access is provided through travel management plans. Roads, motorized trails, nonmotorized trails, rivers, and airstrips provide access for visitors to walk, bike, ride, drive, boat, or fly to their destinations.

Recreation through roads and airstrips generally occurs in motorized ROS settings. Trails occur across all ROS settings, depending upon the mode of transport used for the trail use and whether an area is designated for motorized or nonmotorized uses.

#### Travel plan direction

Travel plan direction has been established for all areas of the HLC NF. These travel plans provide direction to users as to which parts of the NF can be accessed for motorized recreation activities. Table 148 lists the name of the travel plans that provide direction for the HLC NF.

**Table 148. Travel plans by GA**

GA	Name of travel plan	Decision signed (ROD or DN)
Big Belts	North Belts	2005
	South Belts Summer	2007
	South Belts Winter	1999
Castles	Little Belts, Castles, and Crazyies*	2007
Crazyies	Little Belts, Castles, and Crazyies*	2007

GA	Name of travel plan	Decision signed (ROD or DN)
Divide	Divide Travel Plan	2016
	Soundwood Salvage	1998
	Clancy Unionville	2003
Elkhorns	Elkhorns Travel Plan	1995
	North Elkhorns	2014
Highwoods	Highwoods Access	1993
Little Belts	Little Belts, Castles, and Crazies*	2007
Rocky Mountain Range	Badger Two Medicine	2009
	Birch Creek South	2007
Snowies	Big Snowies Access and Travel Management*	2002
	Little Snowies Vegetative Management and Public Access	1993
Upper Blackfoot	Blackfoot Winter Travel Plan	2013
	Blackfoot Non-Winter Travel Plan	2018

\*Decisions that underwent additional resolution or court review.

**Roads**

Roads are the primary routes that recreationists use to access the HLC NF. Roads often provide direct access to recreational facilities. Forest travel plans dictate which roads are open and for how long. Table 149 displays the current miles of road by GA and type of road access on the HLC NF.

**Table 149. Miles of road by GA and by type of road access**

GA	Miles of road open year-round	Miles of road open seasonally	Miles of road closed year-round	Total miles of road
Big Belts	187	198	329	714
Castles	53	9	47	109
Crazies	30	2	90	122
Divide	180	7	309	496
Elkhorns	62	105	132	299
Highwoods	18	0	0	18
Little Belts	424	347	1,014	1,785
Rocky Mountain Range	96	21	27	144
Snowies	42	7	68	117
Upper Blackfoot	204	82	426	712
Totals	1,296	778	2,442	4,516

**Trails**

Table 150 displays the miles of trails broken out by GA within the planning area. Trails are further identified by motorized trails, nonmotorized trails outside of wilderness, and wilderness trails.

**Table 150. Miles of trail by GA and type of trail**

GA	Miles of motorized trail	Miles of nonmotorized trails outside of wilderness	Miles of wilderness trail	Total miles trail
Big Belts	61	101	37	199
Castles	89	12	0	101
Crazies	32	46	0	78
Divide	60	110	0	170
Elkhorns	6	110	0	116
Highwoods	28	10	0	38
Little Belt Mountains	486	210	0	696
Rocky Mountain Range	50	376	553	979
Snowies	14.1	106	0	120.1
Upper Blackfoot	24	109	96	229
Totals	850.1	1,190	686	2,726.1

***Motorized over-snow trails and motorized over-snow areas***

The motorized over-snow trails on the HLC NF include both groomed and ungroomed trails and are often only a small portion of a larger network of over-snow trails that extend onto state, county, and private roads and lands. The groomed trails are often maintained by local snowmobile clubs. Table 151 shows the number of miles of groomed and ungroomed trails on the HLC NF.

**Table 151. Miles of motorized over-snow trail by GA**

GA	Miles of groomed trail	Miles of ungroomed trail	Total for GA
Big Belts	73	15	88
Castles	0	38	38
Crazies	0	20	20
Divide	100	25	125
Elkhorns	0	0	0
Highwoods	0	36	36
Little Belt Mountains	292	168	460
Rocky Mountain Range	0	55	55
Snowies	0	54	54
Upper Blackfoot	85	58	143
Totals	550	469	1,019

In addition, the Forest has approximately 854,704 acres open for over-snow motorized use during the winter season. Over-snow motorized use is very popular on the Forest. Table 152 displays the approximate acreages that are open for over-snow motorized uses on the HLC NF.

**Table 152. Acres open to motorized over-snow use by GA**

GA	Acres open to motorized over-snow recreation use
Big Belts	80,026
Castles	55,105
Crazies	21,278

GA	Acres open to motorized over-snow recreation use
Divide	114,263
Elkhorns	25,349
Highwoods	0
Little Belt Mountains	368,755
Rocky Mountain Range	27,653
Snowies	34,543
Upper Blackfoot	127,732
Total	854,704

### *Aviation recreation*

Another recreation activity that receives considerable attention within the HLC NF planning area and is growing in popularity is aviation recreation. Owners of small aircraft use backcountry air strips to access dispersed campgrounds or dispersed recreation areas. Table 153 displays these air strips and the GAs in which they are located.

**Table 153. Airstrips and the GAs where they are located**

GA	Name of Air Strip	Location
Little Belt Mountains	Russian Flats Backcountry Airstrip	T11N R11E Sections 7, 12, and 13
Rocky Mountain Range	Benchmark Backcountry Airstrip	T20N R10W Sections 15, 16, and 22
Upper Blackfoot	Lincoln Community Airport	T14N R08W Sections 19 and 20

## **3.19.6 Environmental consequences**

### **Effects Common to All Alternatives**

In all alternatives, natural disturbances, recreation use patterns, and emerging technologies would continue to influence recreation access across the HLC NF. Travel plans would continue to provide site-specific direction for where motorized and nonmotorized uses can take place. The three current airstrips would remain available under all alternatives.

Under all alternatives, no direct changes would be made to existing travel plans or associated miles of open roads, motorized trails, nonmotorized trails open to mechanized means of transportation, motorized over-snow trails, acres open to motorized over-snow uses, or airstrips. However, the suitability for such uses would be established by plan components to guide future site-specific analyses, such as travel planning.

### **Effects Common to All Action Alternatives**

The effects of the plan components developed for recreation access would remain the same in all action alternatives. Desired ROS settings would provide a variety of recreation access opportunities across the HLC NF. Site-specific determinations on where motorized uses and mechanized means of transportation may and may not occur would be determined in travel planning decisions outside of the Plan and forest planning process. Table 154 summarizes the plan components related to recreation access. The collective effect of these plan components would be the establishment of management direction for sustainable recreation access across the HLC NF.

**Table 154. Summary of plan components for recreation access**

Recreation access plan component	Summary of plan components for recreation access
FW-ACCESS-DC-01, 02, and 03	These desired conditions state that the forest would provide a variety of access options for recreation uses on system roads, trails, and airstrips, and that users stay on these designated systems to recreate.
FW-ACCESS-DC-04	This desired condition states that facilities that support recreation access contribute to the public health and safety and protect natural and cultural resources.
FW-ACCESS-GO-01	The FS works in cooperation with landowners, other agencies, and partners to provide legal access to public lands.
FW-ACCESS-GDL-01	Unauthorized recreation trails should be rehabilitated.
FW-ACCESS-GDL-02	Trailheads and airstrips should be strategically located to provide the best opportunities for recreation access.

### *Recreation Aviation Access*

Public commenters asked for the allowance of more access for recreation aviation activities, especially for provisions for airstrips or where motorized aircraft may take off and land. Access for recreation aviation activities would be determined by the ROS classes for the action alternatives. Please see the recreation settings section for further clarifications.

### *Mechanized Means of Transportation Access*

Additionally, public commenters wanted additional considerations for mechanized means of transportation (most specifically, mountain bikes), including the opportunity to access and recreate within primitive ROS settings. These comments were considered in the development of alternatives to the proposed action.

### *Effects from forest plan components associated with:*

#### **Aquatic ecosystems and soil management**

Plan components and activities related to watershed, soil, riparian, or aquatic habitat improvements would have effects to some recreation special access. The plan components that would have the greatest influence on recreation access under all action alternatives are those associated with RMZs. East of the Continental Divide (the majority of the HLC NF), RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. West of the Continental Divide, the area influenced by riparian plan components is the same across all alternatives because RMZs would be defined the same way as riparian habitat conservation zones are in the no-action alternative. Please refer to the RMZ section.

Recreation access can often be found in areas located within RMZs and near sources of water across the forest. Where possible recreation access activities would be located outside of RMZs. Aquatic and soil management activities may have an impact on recreation access. Existing recreation access locations may be hardened with gravel to reduce impacts to bare soil and/or areas may be confined with parking barrier to keep the recreation public out of sensitive resource areas. New construction of developed recreation sites associated with recreation access, including considerations for outhouse location and water systems, would need to meet more stringent requirements. Vegetation management along recreation access routes would also need to meet RMZ plan components. Plan components for RMZs would limit road construction and vegetation management activities that could occur in association with recreation access.

All action alternatives provide direction and guidance for the management of recreation access to protect watershed, soil, riparian and aquatic habitats, most specifically within RMZs. The area on which these components apply is greater with the action alternatives than with the no-action alternative on landscapes east of the Continental Divide. These components may limit or restrict the development of certain recreation access

points or facilities within RMZs, and over time may decrease the number of recreation access facilities found in those areas.

**Fire and fuels management**

Unplanned and prescribed fires would continue to affect the long-term ecological processes across the Forest. These fire activities could create a temporary loss of vegetation, reduction in water quality due to sedimentation, or reduction in recreation access to some recreation opportunities on the Forest. All action alternatives include plan components that support the use of unplanned and prescribed fires as natural ecosystem processes that can move the landscape towards desired conditions.

**Timber and vegetation management**

Timber management would continue on lands suitable for timber production as well as unsuitable lands where harvest may occur to achieve other multiple use values. These activities may be noticeable from roads and trails across the forest. Additionally, temporary road and trail closures required to accomplish timber and vegetation management activities, may have short-term impacts to recreation access.

**Livestock grazing and management**

Grazing of livestock is allowed within approved allotments across the Forest. There would be little to no effect of livestock grazing to recreation access on the Forest.

**Wildlife habitat management**

Activities related to wildlife habitat improvements and management would affect recreation access across the HLC NF. Within the PCA and Zone 1 the density of motorized access routes would not be allowed to increase above the established baseline, which could affect the potential for motorized recreation in those areas in the future. Plan components for management of lynx habitat could impact some types of recreation access. Big game habitat management could also affect the timing or type of motorized recreation access opportunities in some areas.

**Alternative A, no action**

Recreation access would continue to be managed under the 1986 Helena and Lewis and Clark Forest Plans. Travel plans would provide the direction for where motorized uses can and cannot occur, and wilderness and other laws may determine where various recreation facilities, such as trailheads and airstrips, occur. Table 155 describes the plan components in the 1986 Helena and Lewis and Clark Forest Plans that provide direction for recreation access.

**Table 155. Summary of 1986 plan components for recreation access**

Plan component	Summary of 1986 plan components for recreation access
1986 Helena NF Plan, Objectives, Resource Activity/Summaries Facilities, Page II/6	Transportation facilities such as roads and trails would be constructed, managed, and maintained to cost effectively meet the Forest land and resource objectives and visitors' needs. This objective also talks about the integration and coordination of public and private with NF system roads and trails.
1986 Helena NF Plan, Forest-wide Standards, Facilities/Road Management, Facilities/Trails, Pages II/31 through II/33	The road management standards generally focus on the availability of roads, trails, and areas to motorized uses. This standard also provides criteria for road, trail, or area restrictions. The trails standards reference FSH 2309.18 and outline priority trails work as well as provides direction for construction, reconstruction, abandonment, and/or rerouting of trails.
1986 Helena NF Plan, Management Areas, Pages III/3 through III/97	Each of the management areas provides direction for recreation access, generally in discussions of roads and trails facilities.
1986 Lewis and Clark NF Plan, Forest-wide Objectives	These objectives state that transportation facilities, such as roads, trails and airfields, would be constructed, managed, and maintained to cost

Plan component	Summary of 1986 plan components for recreation access
Facilities, Page 2-8	effectively meet the Forest land and resource objectives and visitors' needs. This objective also talks about the integration and coordination of public and private with NF system roads and trails. This objective ensures adequate and safe airfield facilities for the Forest's needs.
1986 Lewis and Clark NF Plan, Forest-wide Standards, Travel Planning L-2, Maintenance and Construction of Roads, Trails, and Other Facilities L-4, Pages 2-64 through 2-71.	These standards provide direction for road and trail facilities on the Forest. Specifically, Standard L-2 provides direction for the development of travel plans for roads and trails. Standard L-4 provides direction for the proper construction, reconstruction, and rehabilitation of roads and trails on the Forest.
1986 Lewis and Clark NF Plan, Management Areas, Pages III/3 through III/97.	Each of the management areas provides direction for recreation access, generally in discussions of roads and trails facilities.
1986 Lewis and Clark NF Plan, appendix O, Roads and Trails Management	This table describes the amount of public access and the categories of trail management by management area. This table does not discuss winter trails or airstrip access.

## Alternative B

The amount and location of RWAs in alternative B would influence recreation access. In alternative B, nine (9) areas were identified as RWAs. These nine RWAs are located within five GAs and total approximately 213,076 acres. Motorized and mechanized means of transportation (including bicycles) would be unsuitable within RWAs in alternative B.

Identifying RWAs would create a need for reductions in motorized and mechanized means of transportation to meet the suitability requirements in the Plan, in alternative B. These changes in suitability may be reflected in future site-specific travel plan decisions and may reduce the amount of motorized and mechanized recreation access in each RWA.

See appendix K for more details on the potential future effects of changes to recreation access that may result from changes to suitability within RWAs.

## Alternative C

Alternative C was developed to address several comments received during public scoping of the proposed action. Specifically, the mountain bike community was concerned about potential loss of access to areas identified as RWA's, especially in the Elkhorns and Snowies GAs. To address these concerns, alternative C identifies the same nine (9) RWAs as alternative B. However, motorized and mechanized means of transportation would be suitable within RWAs in alternative C, so long as these uses do not affect the wilderness characteristics within the RWAs.

Also, in response to public comment, mechanized means of transportation would be unsuitable in the core area of the Elkhorns GA. See map in appendix A. Identifying the core area of the Elkhorns as unsuitable for mechanized means of transportation supports a remote, undeveloped area within the Elkhorns that would protect and/or enhance wildlife habitat. Making the core area of the Elkhorns unsuitable for mechanized means of transportation may be reflected in a future site-specific decision and would reduce the amount mechanized means of transportation access in the Elkhorns GA. Please see appendix K for potential effects to the trails within the Elkhorns core area that may be impacted by suitability in alternative C.

Additionally, a change to ROS settings in the center of the Elkhorns (see the Recreation Settings section) would potentially affect motorized over-snow recreation access within the Elkhorns GA in alternative C. Currently, in the winter, the Elkhorns are open to motorized over-snow uses within a semiprimitive motorized ROS setting. In alternative C, the semiprimitive motorized setting would be changed to semiprimitive nonmotorized and over-snow motorized uses would no longer be suitable in this area.

See appendix K for details on the potential future direct effects to motorized winter access in this area of the Elkhorns GA.

### Alternative D

Alternative D responds to comments received during public scoping asking the Forest to consider an alternative that increased the number and acreage of RWAs and primitive recreation opportunities on the forest. To address these concerns, additional RWAs and several primitive, undeveloped areas are identified in alternative D. Motorized and mechanized means of transportation (including bicycles) would not be suitable within RWAs in alternative D. These changes in suitability may be reflected in future site-specific travel plan decisions and may reduce the amount of motorized and mechanized recreation access in each RWA.

Alternative D also identifies additional primitive, undeveloped areas outside of RWAs. Motorized uses would not be suitable in these primitive undeveloped areas; however, mechanized means of transportation (including bicycles) would be suitable within them.

See appendix K for more details on the potential effects of future changes to recreation access that may result from changes to suitability within RWAs.

### Alternative E

Alternative E responds to comments received during public scoping asking the Forest to consider an alternative that does not identify RWAs and that increases the amount of forest lands available for timber production. Alternative E does not include any RWAs. There would be no suitability requirements for any specific areas within this alternative. Travel plans would continue to provide the direction for where motorized uses can and cannot occur.

### Alternative F

Alternative F responds to comments regarding mechanized means of transportation (including bicycles) and concerns about ROS settings received during of the comment period on the DEIS. This alternative identifies seven (7) RWAs which is fewer than the number identified in the proposed action. Like alternatives B and D, motorized and mechanized means of transportation (including bicycles) would be unsuitable within RWAs in alternative F.

Alternative F also identifies several additional primitive, undeveloped areas outside of RWA boundaries that would be managed for a primitive ROS setting. Motorized uses would not be suitable in these primitive undeveloped areas; however, mechanized means of transportation (including bicycles) would be suitable within them.

Similar to alternative C, a change to ROS settings in the center of the Elkhorns (see the recreation settings section) would affect the suitability of motorized uses within the Elkhorns GA. Currently, in the winter, the Elkhorns are open to motorized over-snow uses within a semiprimitive motorized ROS setting. In alternative F, the semiprimitive motorized setting would be changed to semiprimitive nonmotorized setting, and over-snow motorized recreation uses would no longer be suitable within this area. This change in suitability may be reflected in future site-specific travel plan decisions and may reduce the amount of motorized winter recreation access within the Elkhorns core area.

See appendix K for more details of the potential effects of future site-specific changes to recreation access that may result from changes to suitability within the Elkhorns and within RWAs in alternative F.

### Cumulative Effects

The demand for recreation access is likely to increase in magnitude and complexity as population demographics grow and change across the HLC NF, and as new and emerging technologies are developed.



This underscores the importance of plan components that provide for a sustainable array of recreation access across the landscape that are congruent with other resource and multiple use needs.

Some adjacent lands are subject to their own resource management plans. The land management plans for adjacent federal, state, and tribal lands would generally be complementary to the 2021 Land Management Plan in terms of providing for recreation access across the broader landscape. The cumulative effects to recreation access from these other resource management plans with the 2021 Land Management Plan are summarized in Table 156.

**Table 156. Summary of cumulative effects to recreation access from other resource management plans**

Resource plan	Description and summary of effects
Blackfeet Nation: Wildland Fire Management Plan, (2018)	The Blackfeet Nation's Wildland Fire Management Plan is a strategic document that contains operational direction designed to guide a full range of fire management activities on a unit or area supported by land management plans. This plan provides direction for wildland fire only and does not provide direction for recreation access on tribal lands.
Bureau of Land Management (BLM): Resource Management Plans	BLM lands near the HLC NF are managed by the Butte, Missoula, and Lewistown field offices. All three plans have undergone recent revisions. These documents contain a lot of direction for recreation access and travel management. This direction is complementary to the plan components in the 2021 Land Management Plan.
Bureau of Reclamation (BOR): Resource Management Plans, * Canyon Ferry RMP * Canyon Ferry Reservoir Shoreline RMP	These documents describe the measures the BOR will take toward the restoration and management of BOR lands surrounding the Canyon Ferry Reservoir. These plans consider recreation access to the reservoir for boating and camping along the shore. The direction in these plans is consistent with the plan components in the 2021 Land Management Plan.
City of Helena: *Comprehensive Park Plan *Parks, Recreation, and Open Space Plan	The Parks, Recreation, and Open Space Plan (2010) includes goals and recommendations for open lands associated with the city which are immediately adjacent to NFS lands in the Divide GA. These measures complement the 2021 Land Management Plan components for recreation access in the Divide GA, including the South Hills Recreation Area.
County Growth Policies	These plans are integrated documents that focus on growth management and economic development strategies. These plans do not address recreation access.
County Wildfire Protection Plans	The overall effect of the county plans would be to influence where treatments occur to contribute to desired vegetation conditions. Some county wildfire protection plans map and/or define the WUI. These plans do not address recreation access.
Forest Service: Land Management Plans	The forest plans for NFS lands adjacent to the HLC NF include the Lolo, Flathead, Beaverhead-Deerlodge NFs and Custer-Gallatin NFs. The Flathead NF plan was revised in 2018 and the Custer-Gallatin NF plan is undergoing revision at the time this report was prepared. These plans address recreation access and travel planning and have forest plan components consistent with the plan components in the 2021 Land Management Plan.
Montana State - DNRC: *Statewide Forest Resource Strategy *Habitat Conservation Plan *Water Plan	These plans guide resource management on state lands. They include many concepts that are consistent with the 2021 Land Management Plan.
Montana State - FWP: Conservation Management Plans *Wildlife Action Plan	These conservation management plans provide specific direction for the management for wildlife and fish on Montana State lands. Recreation access is mentioned in these plans. This direction is consistent with the 2021 Land Management Plan.

Resource plan	Description and summary of effects
*Big Horn Sheep Conservation *Elk Management Plan *Fish Management Program	
Montana State – State Parks: * Montana State Parks Strategic Plan (2020) *Statewide Comprehensive Outdoor Recreation Plan (SCORP)	The MT State Parks Strategy provides guidance to the state park program and addresses a strategic framework to strengthen the park system in Montana. The SCORP is a Montana statewide comprehensive outdoor recreation plan that serves as a guiding document to promote integrated outdoor recreation management and service provision in a more holistic and effective manner. The SCORP document discusses recreation access and is consistent with direction in the 2021 Land Management Plan.
Montana State - MFAAC: Montana Forest Action Advisory Council (MFAAC) (2020) *Assessment of Forest Condition *Forest Action Plan	These plans aim to take a seamless and coordinated cross-boundary approach to address the pressing concerns of forest health and wildfire risk across all lands in Montana. Recreation access is mentioned in these plans and is consistent with the 2021 Land Management Plan.
Montana Army National Guard: Integrated Natural Resources Plan, Lime Hills Training Area	This natural resource management plan provides direction for the Lime Hills Training Area and was designed to support and accommodate military missions while providing for natural resource stewardship and management. The document focuses on native ecosystems, wildlife, fire, noxious weeds, livestock grazing, cultural resources, and road upgrades and maintenance. This plan does not address recreation access.
National Park Service (NPS): Glacier National Park, *General Management Plan (1999) *National Park Bear Mgmt. Plan	The General Management plan for Glacier National Park calls for preserving natural vegetation, landscapes, and disturbance processes. Management of recreation settings is described in 4 zones: visitor service, day use, rustic, and backcountry. The Park manages recreation access more intensely than the HLN National Forest, due to the large number of visitors this area receives. The National Park Bear Mgmt Plan outlines goals and objectives for the management of grizzly bears within the park. The direction in these plans is consistent with the 2021 Land Management Plan.
Natural Resources Conservation Service (NRCS): Strategic Plans *MT Soil Health Strategy * MT Sage Grouse Initiative Strategy	These plans do not address recreation access.

## Conclusions

Under alternative A, recreation access would continue to be managed under the 1986 plans. Travel plans would continue to provide the direction for where motorized uses can and cannot occur. Wilderness and other laws may determine where future changes to recreation access may occur.

The plan components for recreation access would remain the same in all the action alternatives. By providing the plan components outlined in the action alternatives, the HLC NF would meet the purpose and need of the 2021 Land Management Plan, ensuring that recreation access is ecologically, economically, and socially sustainable for present and future generations.

There are currently 3 airstrips located in the HLC NF and there would be no changes to those airstrips in any of the alternatives.

See appendix K for more details on the potential effects of future changes to recreation access that may result from changes to suitability within RWAs.

## 3.20 Scenery

### 3.20.1 Introduction

The scenery of the forest is important to the overall settings and experiences people encounter when visiting the Forest. Therefore, maintaining natural appearing landscapes contributes to recreation experiences and sense of place within the Forest. Understanding the values of scenic character and maintaining scenic integrity are important components of scenery management.

This section reviews the effects to SIOs related to changes in ROS settings as well as the effects of plan components associated with scenery. These effects are displayed by acres of desired SIOs by alternative.

#### Issues

No issues of significance regarding scenery were raised during the analysis. Scenery did not drive the development of alternatives in the FEIS.

#### Measurement indicators

Effects to scenery will be measured by the impact of the plan components on the overall management of scenery across the forest. Additionally, effects to scenery will be measured by the percent of each scenic integrity level within each geographic area by alternative.

#### Analysis area

The geographic scope of the analysis is the lands administered by the HLC NF. All lands within the forest boundary form the geographic scope for cumulative effects. The temporal scope is the life of the plan (approximately 15 years).

#### Changes between draft and final

There were minor mapping changes of the scenic integrity levels between the draft and final EIS. This was a result of updated data and information between draft and final EIS.

### 3.20.2 Regulatory framework

Please see the regulatory framework for Recreation Settings.

### 3.20.3 Assumptions

This analysis assumes that natural changes to forest conditions would continue and that these changes would have a dynamic effect on the scenery of the Forest.

### 3.20.4 Best available scientific information used

Currently both the 1986 Helena and the Lewis and Clark Forest Plans use the visual management system to describe and determine the effects of management practices to scenery. The visual management system was a systematic approach to inventory, analyze, and monitor scenic resources, but it did not recognize or incorporate natural disturbance processes such as fire, insects and disease, or valued cultural attributes of FS landscapes. Due to these deficiencies, the visual management system was replaced in 1995 by the scenery management system outlined in *Landscape Aesthetics: A Handbook for Scenery Management, Agriculture Handbook 701*. Handbook 701 describes the most current FS direction for the management of scenery resources on NFS lands, and provides the process used for this analysis.

### **3.20.5 Affected environment**

#### **Scenic character descriptions**

Scenic character is defined as a combination of the physical, biological, and cultural images that give an area its scenic identity and contribute to its sense of place. The scenic character provides a frame of reference from which to determine the scenic attractiveness of a landscape and to measure changes to the scenic integrity of the scenery described.

Additionally, scenic character is often enhanced by cultural elements found on the landscape. Many of these include old barns and historic structures, remaining evidence of past mining activity, and unique features on the landscape such as historic fences and signs.

Many of the scenic qualities that contribute to or make up the scenic character across these landscapes are outlined and discussed in the “distinctive roles and contributions” segment for each of the GAs in the Plan.

Full landscape character descriptions and important viewpoints for each of the GAs are described in appendix G of the Plan; this constitutes the bulk of the affected environment description.

#### **Scenic attractiveness**

Scenic attractiveness is the primary indicator of the intrinsic beauty of a landscape. Scenic attractiveness helps to determine the level of importance of scenic beauty based on perceptions of landform, vegetation patterns, composition, water, and land use patterns and cultural features. Landscape elements are rated at various levels of scenic values, or attractiveness, and the forest scenic character descriptions serve as the frame of reference for determining scenic attractiveness.

#### **Landscape visibility**

Landscape visibility addresses the relative importance and sensitivity of what is seen and/or perceived in a given landscape. Landscape visibility is measured from what is seen from main travelways and use areas and from the distance the viewer is from the landscape being viewed. Additionally, individual members of the public may place a higher degree of importance to the viewing of scenery from unique travelways, use areas, or viewpoints. Landscape visibility is mapped with a GIS and is determined by distance zones, or the distance at which the landscape is being viewed.

The prominent viewpoints for each GA are listed in the Plan, appendix G.

#### **Scenic integrity and scenic integrity objectives**

Scenic integrity is defined as a measure of the degree to which a landscape is visually perceived to be complete, when compared to the landscape character described for that area. The highest scenic integrity ratings are given to those landscapes which have little or no deviation from the identified scenic character.

SIOs are developed in coordination with the recreational setting, management direction, and the scenic class that were developed from the scenic inventory. SIOs are incorporated based on the 2012 Planning Rule, as defined in the glossary. These objectives are mapped using a GIS modeling process. These desired SIOs, combined with the scenic character descriptions, provide direction for the management of scenery on the forest. Individual desired SIO maps were developed for each of the GAs on the Forest for each alternative.

Table 157 describes each of the SIOs.

**Table 157. SIOs and descriptions**

<b>SIO</b>	<b>Description</b>
Very High	The valued scenery appears natural or unaltered. Only minute visual disturbances to the valued scenery, if any, are present.
High	The valued scenery appears natural or unaltered, yet visual disturbances are present; however, they remain unnoticed because they repeat the form, line, color, texture, pattern and scale of the valued scenery
Moderate	The valued scenery appears slightly altered. Noticeable disturbances are minor and visually subordinate to the valued scenery because they repeat its form, line, color, texture, pattern and scale.
Low	The valued scenery appears moderately altered. Visual disturbances are co-dominant with the valued scenery and may create a focal point of moderate contrast. Disturbances may reflect, introduce or “borrow” valued scenery attributes from outside the landscape being viewed.
Very Low	The valued scenery appears heavily altered. Disturbances dominate the valued scenery being viewed; and they may only slightly borrow from, or reflect, valued scenery attributes within or beyond the viewed landscape.

The HLC NF has a wide range of existing scenic integrity, as displayed for Alternative A in the environmental consequences section. Areas designated for very high scenic integrity are often located in remote and pristine areas. There are areas across the forest that have low to moderate existing scenic integrity. Some of these lands include areas that show contrast in shape, form and texture with the surrounding natural appearing environment.

### Scenic classes

Scenic classes represent the relative landscape value by combining visibility mapping inventories and scenic attractiveness inventories.

### 3.20.6 Environmental consequences

Scenery is affected by activities that may alter the appearance of the landscape. These activities can be either natural processes, such as wildfire and insect and disease processes, or human management activities.

#### Effects common to all alternatives

Scenery is an important component of forest management and would continue to be planned for and managed in all alternatives. Scenic values would be managed at the highest level for all wilderness areas.

#### Effects common to all action alternatives

All action alternatives include the same desired conditions, guidelines, standards, and monitoring for scenery. Table 158 summarizes the plan components for scenery. The collective effects of these plan components would be the establishment of management direction for a sustainable scenic integrity on the forest.

**Table 158. Summary of plan components for scenery, all action alternatives**

<b>Scenery plan component</b>	<b>Summary of plan components for scenery</b>
FW-SCENERY-DC-01	This desired condition bases scenery on the natural form, lines, colors, and textures found in the inherent scenic character of the Forest and would ensure projects meet the natural scenic characteristics in landscapes. Scenic character descriptions have been developed for each GA across the Forest.
FW-SCENERY-DC-02	SIOs would provide direction to future projects for scenery and would support the valued connections that communities feel with the landscapes that surround them.

Scenery plan component	Summary of plan components for scenery
FW-SCENERY-DC-03	This desired condition connects the importance of scenery to recreation users, recreation settings, and opportunities at recreation facilities.
FW-SCENERY-GDL-01	This guideline provides direction for meeting SIOs in vegetative management and facility construction and development projects. This guideline should ensure that scenery is managed to maintain or enhance the identified scenic character of the GAs across the Forest.

*Effects from forest plan components associated with:*

**Aquatic ecosystems and soil management**

Activities related to watershed, soil, riparian, or aquatic habitat improvements would have little to no effect related to the overall management of scenic quality on the Forest.

**Fire and fuels management**

Wildfire can have a notable impact on both the aesthetics of an area and the amount and distribution of recreation uses across the landscapes they affect. Unplanned and prescribed fires would continue to affect the long-term ecological processes across the Forest. These fire effects would include a temporary loss of vegetation, reduction in water quality due to sedimentation, and air pollution. The changes to vegetation caused by fires can also change the scenic character and the recreational uses of parts of the Forest for long periods of time; however, these effects often tend to mimic naturally occurring topography and vegetation patterns in the area. All action alternatives include plan components that support the use of unplanned and prescribed fires as natural ecosystem processes that can move the landscape towards desired conditions.

**Timber and vegetation management**

Timber harvesting and road building can sometimes create obvious and long-lasting effects to the scenery of an area. Since scenery is measured from viewpoints within and across the forest, placement of these types of management activities is critical to overall effects to scenery. Additionally, final silviculture prescriptions and the design of the units themselves should mimic naturally occurring landscape and forest vegetation patterns. All action alternatives include plan components that consider the management of scenery as an integral part of timber and vegetative management.

**Livestock grazing and management**

Activities related to livestock grazing and management would have little to no effect related to the overall management of scenic quality on the Forest.

**Wildlife habitat management**

Activities and/or plan components related to wildlife habitat management would have little to no effect related to the overall management of scenic quality on the Forest.

**Cultural, historic, and tribal resource management**

Often cultural and historic features on a landscape contribute in a positive way to the overall landscape character of an area. As outlined in the landscape character descriptions for each GA found in appendix G of the Plan, the remnants of historic architecture and other features of past human occupation often provide the area in which they are located with a sense of place or identity. All action alternatives include plan components that tie cultural and historic features to landscape character.

**Road access and infrastructure**

Management of road access and infrastructure would have little to no effects related to the overall management of scenic quality on the Forest.

**Alternative A, no action**

In alternative A, the HLC NF would continue to manage scenery under direction provided in the 1986 Helena and Lewis and Clark Forest Plans. Projects would continue to use the visual management system and visual quality objectives to analyze and measure effects to the visual quality on the Forest.

The visual management system is an older, outdated method to analyze effects to visual quality. This system was replaced by the scenery management system (Landscape Aesthetics: A Handbook for Scenery Management, Agriculture Handbook 701(U.S. Department of Agriculture, Forest Service, 1995b)) in 1995 which is now required for all future analysis of scenery. To enable better understanding of the comparison between the alternatives, a cross-walk of the terminologies between the visual management system and the scenery management system is displayed in Table 159.

**Table 159. Crosswalk between visual quality objective and scenery management system terms**

Visual management system Visual quality objectives	Scenery management system SIOs
Preservation	Very High
Retention	High
Partial retention	Moderate
Modification	Low
Maximum modification	Very Low

Table 160 describes the expected effects of the plan components in the 1986 Helena and Lewis and Clark Forest Plans that provide the current direction for visual quality.

**Table 160. Summary of existing 1986 plan components for visual quality**

Plan component	Summary of 1986 plan components for visual quality
1986 Helena NF Plan Goal 9, Page II/1.	“Provide Forest visitors with visually appearing scenery.”
1986 Helena NF Plan Objective, Resource Activity/ Summaries, Visual Page II/3.	This objective states that visual landscape management practices would have emphasis in areas seen from identified visually sensitive roads and trails and that mitigation measure would be applies to resource activities that may affect the visual settings.
1986 Helena NF Plan Forest-wide Standards, Visual, Page II/15.	This forest-wide standard establishes that visual quality objectives would be applied to each management area and would provide the guidance for altering landscapes. Some portions of each management area may have more or less restrictive visual quality objectives and these are determined by sensitive viewpoints or viewing areas. This standard also states that visual quality along the Continental Divide National Scenic Trail would be the same as the management area through which it passes.
1986 Helena NF Plan, Management Areas, Pages III/3 through III/97.	A visual quality objective(s) is established for each of the management areas on the Forest.
1986 Helena NF Plan, appendix B, Sensitive Viewing Areas, Pages B/1-B/2.	This table establishes the visual quality objectives along a listing of heavily used roads or popular recreation areas.
1986 Lewis and Clark NF Plan Long Range Goal 1, Page 2-2.	This goal aims to coordinate resource development and use activities so as to protect and improve land and resource quality and productivity, including natural beauty and quality air, water, and soil.
1986 Lewis and Clark NF Plan Forest-wide Objective,	This objective states that visual landscape management would be emphasized in areas that are seen from identified visually sensitive roads

Plan component	Summary of 1986 plan components for visual quality
Visual Resources, Page 2-4.	and trails and that mitigation measure would be applies to resource activities that may affect the visual settings.
1986 Lewis and Clark NF Plan Forest-wide Standard A-8 Pages 2-28 and 2-29.	This standard directs the forest to use the NF Landscape Management System for visual resource management. It further states that a visual quality objective would be established for each management area which would provide the guidance for altering landscapes. Some portions of each management area may have more or less restrictive visual quality objectives and these are determined by sensitive viewpoints or viewing areas. Sensitive viewing roads, trails, and viewing areas are listed.
1986 Lewis and Clark NF Plan Management Areas, Pages III/3 - III/97.	A visual quality objective(s) is established for each of the management areas on the Forest.
1986 Lewis and Clark NF Plan appendix N, Existing Visual Condition, Pages N-1 and N-2.	This appendix provides direction for evaluating the existing visual condition of landscapes.

Table 161 displays the existing acres and percent of the forest assigned to each visual quality objective in alternative A. Table 162 shows the percent visual quality objective by GA.

**Table 161. Acres and percentage of visual quality objectives in alternative A**

Visual quality objectives	Acres	Percent of forest
Preservation	598,474	21
Retention	265,211	9
Partial Retention	647,433	22
Modification	1,372,287	48
Maximum Modification	0	0

**Table 162. Percent of visual quality objectives by GA (alternative A)**

GA	Preservation	Retention	Partial retention	Modification	Maximum modification
Big Belts	15	5	49	31	0
Castles	0	22	23	55	0
Crazies	0	15	1	84	0
Divide	8	2	21	69	0
Elkhorns	0	7	31	62	0
Highwoods	0	12	18	70	0
Little Belt Mountains	0	14	22	64	0
Rocky Mountain Range	58	9	15	18	0
Snowies	0	11	6	83	0
Upper Blackfoot	25	2	24	49	0

### Alternative B

Alternative B establishes desired SIOs for each GA using the scenery management system as per the direction provided in the 2012 Planning Rule. These desired SIOs were mapped using the process outlined in the Scenery Management System and provide direction for managing the scenic quality on the Forest. Table 163



and Table 164 depict the acreages and percent total of the desired SIOs in alternative B. Individual maps of the SIOs are found by GA in appendix A.

Differences in the acres and percent of the forest in each desired SIO category are related to the presence of RWAs. All RWAs are allocated a Very High SIO. As areas of Very High SIO increase, the amount of High SIO decreases.

**Table 163. Desired SIOs for alternative B**

SIO	Acres	Percent of forest
Very High	846,114	30
High	1,479,229	51
Moderate	354,111	12
Low	203,790	7

**Table 164. Percent of SIOs by GA (alternative B)**

GA	Very high	High	Moderate	Low	Very low
Big Belts	15	56	16	13	0
Castles	0	57	27	16	0
Crazies	0	82	11	7	0
Divide	16	52	25	7	0
Elkhorns	0	68	15	17	0
Highwoods	0	97	3	<1	0
Little Belt Mountains	10	60	19	11	0
Rocky Mountain Range	58	42	<1	<1	0
Snowies	81	4	6	9	0
Upper Blackfoot	42	44	11	3	0

### Alternative C

Like alternative B, alternative C would establish desired SIOs for each GA as per the direction provided in the 2012 Planning Rule. The desired SIOs in alternative C reflect changes to ROS classes in the center of the Elkhorns GA. Table 165 and Table 166 depict the acreages and percent total of the desired SIOs in alternative B. Individual maps of the SIOs are found by GA in appendix A.

Differences in the acres and percent of the forest in each desired SIO category are related to the presence of RWAs. All RWAs are allocated a Very High SIO. As areas of Very High SIO increase, the amount of High SIO decreases.

**Table 165. Desired SIOs for alternative C**

SIO	Acres	Percent of forest
Very High	846,114	30
High	1,479,566	51
Moderate	354,054	12
Low	203,511	7

**Table 166. Percent of SIOs by GA (alternative C)**

GA	Very high	High	Moderate	Low	Very Low
Big Belts	15	56	16	13	0
Castles	0	57	27	16	0
Crazies	0	82	11	7	0
Divide	16	52	25	7	0
Elkhorns	0	69	15	16	0
Highwoods	0	97	2	1	0
Little Belt Mountains	10	60	19	11	0
Rocky Mountain Range	58	42	<1	<1	0
Snowies	81	4	6	9	0
Upper Blackfoot	42	44	11	3	0

**Alternative D**

Alternative D responds to comments received during public scoping asking the Forest to consider an alternative that increases the amounts of RWAs and primitive recreation opportunities on the Forest. This increase of the number and acres of RWAs and the emphasis on undeveloped areas created a shift in the SIOs, increasing the amount of very high and high SIOs. Table 167 and Table 168 depict the acreages and percent total of the desired SIOs for alternative D. Individual maps of the SIOs are found by GA in appendix A.

**Table 167. Desired SIOs for alternative D**

SIO	Acres	Percent of forest
Very High	1,232,948	43
High	1,099,580	38
Moderate	348,899	12
Low	201,818	7

**Table 168. Percent of SIOs by GA (Alternative D)**

GA	Very high	High	Moderate	Low	Very low
Big Belts	22	49	16	13	0
Castles	44	13	26	17	0
Crazies	43	40	11	6	0
Divide	30	39	24	7	0
Elkhorns	31	38	15	16	0
Highwoods	20	77	3	<1	0
Little Belt Mountains	22	48	19	11	0
Rocky Mountain Range	75	25	<1	<1	0
Snowies	81	3	7	9	0
Upper Blackfoot	42	44	11	3	0

**Alternative E**

Alternative E responds to comments received during public scoping asking the Forest to consider an alternative that does not identify RWAs and that increases the amount of forest lands available for timber harvest. In response to these comments, alternative E does not include any RWAs. Even though there would be no RWAs

in this alternative, the SIOs would generally be high because of the large amount of IRA across the HLC NF. The SIOs would shift some, resulting in a decrease in the amount of area with very high SIOs.

Table 169 and Table 170 depict the acreages and percent total of the desired SIOs the SIO classes for alternative E. Individual maps of the SIOs are found by GA in appendix A.

**Table 169. Desired SIOs for alternative E**

SIO	Acres	Percent of forest
Very High	724,316	25
High	1,594,653	55
Moderate	294,717	10
Low	269,559	10

**Table 170. Percent of SIOs by GA (alternative E)**

GA	Very high	High	Moderate	Low	Very low
Big Belts	10	61	13	16	0
Castles	0	57	27	16	0
Crazies	0	82	10	8	0
Divide	0	67	23	10	0
Elkhorns	0	68	15	17	0
Highwoods	0	97	2	1	0
Little Belt Mountains	8	62	14	16	0
Rocky Mountain Range	58	42	<1	<1	0
Snowies	75	9	4	12	0
Upper Blackfoot	26	59	12	3	0

## Alternative F

Alternative F establishes desired SIOs for each GA using the scenery management system as per the direction provided in the 2012 Planning Rule. These desired SIOs were mapped using the process outlined in the Scenery Management System and provide direction for managing the scenic quality on the Forest. Like alternatives B, C, and D above, the number and acres of RWAs and the emphasis on primitive areas outside of RWAs affect the amount and location of very high and high SIO's in this alternative.

Table 171 and Table 172 depict the acreages and percent total of the desired SIOs for alternative F. Individual maps of the SIOs are found by GA in appendix A.

**Table 171. Desired SIOs for alternative F**

SIO	Acres	Percent of forest
Very High	1,034,715	36
High	1,288,555	45
Moderate	355,912	12
Low	204,062	7

**Table 172. Percent of SIOs by GA (alternative F)**

GA	Very high	High	Moderate	Low	Very low
Big Belts	15	56	16	13	0
Castles	0	57	27	16	0
Crazies	0	82	11	7	0
Divide	16	51	26	7	0
Elkhorns	28	40	15	17	0
Highwoods	0	97	3	<1	0
Little Belt Mountains	13	57	19	11	0
Rocky Mountain Range	75	25	<1	<1	0
Snowies	81	3	7	9	0
Upper Blackfoot	40	45	12	3	0

### Cumulative Effects

The scenery of the forest is important to the overall settings and experiences people encounter when visiting the Forest. Therefore, maintaining natural appearing landscapes contributes to recreation experiences and sense of place within the Forest. Some adjacent lands are subject to their own resource management plans. The land management plans for adjacent federal, state, and tribal lands would generally be complementary to the 2021 Land Management Plan in terms of protecting and maintaining scenery across the broader landscape. The cumulative effects to scenery from these other resource management plans with the 2021 Land Management Plan are summarized in Table 173.

**Table 173. Summary of cumulative effects to scenery from other resource management plans**

Resource plan	Description and summary of effects
Blackfeet Nation: Wildland Fire Management Plan, (2018)	The Blackfeet Nation's Wildland Fire Management Plan is a strategic document that contains operational direction designed to guide a full range of fire management activities on a unit or area supported by land management plans. This plan provides direction for wildland fire only and does not provide direction for scenery management on tribal lands.
Bureau of Land Management (BLM): Resource Management Plans	BLM lands near the HLC NF are managed by the Butte, Missoula, and Lewistown field offices. These plans have undergone recent revisions. These documents contain direction for visual resource management, which is the equivalent to scenery management in the Forest Service. This direction is consistent to the plan components for scenery in the 2021 Land Management Plan.
Bureau of Reclamation (BOR): Resource Management Plans, * Canyon Ferry RMP * Canyon Ferry Reservoir Shoreline RMP	These documents describe the measures the BOR will take toward the restoration and management of BOR lands surrounding the Canyon Ferry Reservoir. These plans consider visual quality along the shores of the reservoir for boating and camping along the shore, primarily focused on the rehabilitation of sites creating negative effects to visual quality. The direction in these plans is consistent with the plan components in the 2021 Land Management Plan.
City of Helena: *Comprehensive Park Plan *Parks, Recreation, and Open Space Plan	The Parks, Recreation, and Open Space Plan (2010) includes goals and recommendations for open lands associated with the city which are immediately adjacent to NFS lands in the Divide GA. These measures are consistent with plan components for scenery in the 2021 Land Management Plan.
County Growth Policies	These plans are integrated documents that focus on growth management and economic development strategies. Often these plans mention the long-term preservation of scenic views and aesthetics. These policies are consistent with the 2021 Land Management Plan.

Resource plan	Description and summary of effects
County Wildfire Protection Plans	The overall effect of these County Wildfire Protection Plans would be to influence where treatments occur to contribute to desired vegetation conditions. Some county wildfire protection plans map and/or define the WUI. These plans do not address scenery.
Forest Service: Land Management Plans	The forest plans for NFS lands adjacent to the HLC NF include the Lolo, Flathead, Beaverhead-Deerlodge NFs and Custer-Gallatin NFs. The Flathead NF plan was revised in 2018 and the Custer-Gallatin NF plan is undergoing revision at the time this report was prepared. These plans have forest plan components guiding scenery that are consistent with plan components for scenery in the 2021 Land Management Plan.
Montana State - DNRC: *Statewide Forest Resource Strategy *Habitat Conservation Plan *Water Plan	These plans guide resource management on state lands. They include many concepts that are complementary to plan components in the 2021 Land Management Plan. These plans do not address scenery or aesthetic values.
Montana State - FWP: Conservation Management Plans *Wildlife Action Plan *Big Horn Sheep Conservation *Elk Management Plan *Fish Management Program	These conservation management plans provide specific direction for the management for wildlife, and fish on Montana State lands. These plans do not address scenery or aesthetic values.
Montana State – State Parks: * Montana State Parks Strategic Plan (2020) *Statewide Comprehensive Outdoor Recreation Plan (SCORP)	The MT State Parks Strategy provides guidance to the state park program and addresses a strategic framework to strengthen the park system in Montana. The SCORP is a Montana statewide comprehensive outdoor recreation plan that serves as a guiding document to promote integrated outdoor recreation management and service provision in a more holistic and effective manner. The SCORP document discusses scenic quality including in a very general sense but does not address scenery specifically.
Montana State - MFAAC: Montana Forest Action Advisory Council (MFAAC) (2020) *Assessment of Forest Condition *Forest Action Plan	These plans aim to take a seamless and coordinated cross-boundary approach to address the pressing concerns of forest health and wildfire risk across all lands in Montana. Aesthetics are mentioned in these plans but no specific recommendations for scenery/aesthetics are addressed.
Montana Army National Guard: Integrated Natural Resources Plan, Lime Hills Training Area	This natural resource management plan provides direction for the Lime Hills Training Area and was designed to support and accommodate military missions while providing for natural resource stewardship and management. The document focuses on native ecosystems, wildlife, fire, noxious weeds, livestock grazing, cultural resources, and road upgrades and maintenance. This plan does not address scenery.
National Park Service (NPS): Glacier National Park, *General Management Plan (1999) *National Park Bear Mgmt. Plan	The General Management Plan for Glacier National Park calls for preserving natural vegetation, landscapes, and disturbance processes. Management of recreation settings is described in 4 zones: visitor service, day use, rustic, and backcountry. Recreation opportunities within these zones is described. Managing for scenery is key throughout these zones in the National Park. This direction is consistent with the 2021 Land Management Plan. The National Park Bear Mgmt Plan outlines goals and objectives for the management of grizzly bears within the park. This plan does not address scenery.
Natural Resources Conservation Service (NRCS): Strategic Plans	These plans do not address scenery.

Resource plan	Description and summary of effects
*MT Soil Health Strategy * MT Sage Grouse Initiative Strategy	

## Conclusions

Alternative A would not meet the purpose and need because it continues to use the visual management system, which is not the most current process nor the best available scientific information for managing the scenic values on Forest landscapes.

All of the action alternatives (alternatives B-F) would meet the purpose and need because they use the scenery management system to establish desired SIOs for the management of the scenery on the Forest. By using the scenery management system, the FS would be able to protect the valued scenic attributes found within the individual GAs on the forest and would be able to design projects that borrow strongly from the natural features on these landscapes.

Table 174 provides a comparison of the desired SIOs by alternative. For comparison purposes, SIOs were also identified for alternative A, even though visual quality objectives would continue to be used in this alternative. The visual quality objectives are placed in parenthesis behind their SIO equivalents in the table in alternative A. A crosswalk of the terminologies between the visual management system and the scenery management system is displayed in Table 159.

**Table 174. Comparison of the alternatives by desired SIOs**

Alternative	Very high (preservation)	High (retention)	Moderate (partial retention)	Low (modification)	Very low (maximum modification)
A (acres)	598,474	265,211	647,433	1,372,287	0
A (% of forest)	21	9	22	48	0
B (acres)	846,114	1,479,229	354,111	203,790	0
B (% of forest)	29	51	12	7	0
C (acres)	846,114	1,479,566	354,054	203,511	0
C (% of forest)	30	51	12	7	0
D (acres)	1,232,948	1,099,580	348,899	201,818	0
D (% of forest)	43	38	12	7	0
E (acres)	724,316	1,594,653	294,717	269,559	0
E (% of forest)	25	55	10	10	0
F (acres)	1,034,715	1,288,555	355,912	204,062	0
F (% of forest)	36	45	12	7	0

## 3.21 Administratively Designated Areas

### 3.21.1 Introduction

Designated areas are specific areas within a forest that have been given permanent designation to maintain their unique special character or purpose. Some designated areas may be established by statute or law while others may be established through other administrative processes. Certain purposes and restrictions are usually established for designated areas, particularly for those areas that have been designated by law.

Land management plans may include recommendations to establish additional or modify existing previously designated areas. Some administrative designations, such as RNAs, may be designated or established concurrent with a plan decision. Once a designated area is established by the plan decision, the designation continues until a subsequent decision by the appropriate authority removes, or adds to, the designation.

This section analyzes the effects of the Plan to the areas that are administratively designated on the Forest. The following areas will be covered in this section:

- Inventoried roadless areas (IRAs)
- Recommended wilderness areas (RWAs)
- Eligible wild and scenic rivers (WSRs)
- National recreation trails (NRTs)
- Research natural areas (RNAs)
- Tenderfoot Creek Experimental Forest (TCEF)
- Missouri River Corridor
- Smith River Corridor
- South Hills Recreation Area (SHRA)
- Elkhorns Wildlife Management Unit (WMU)
- Kings Hill Scenic Byway (KHSB)
- Badger Two Medicine (BTM)
- Green Timber Basin-Beaver Creek Emphasis Area (GB)
- Grandview Recreation Area (GVRA)

## Issues

A number of issues surfaced during the scoping period for the proposed action. Some of these issues arose from within the FS and some were brought forward by the public. The issues that drove alternatives for administratively designated areas in this analysis were:

- Inventoried Roadless Areas – Eliminate IRAs. (See alternatives considered but not in detail.)
- Recommended Wilderness Areas – Two primary issues with RWAs drove alternatives:
  - The number and locations of RWAs.
  - The suitability of motorized recreation uses and mechanized means of transportation within RWAs.
- Eligible Wild and Scenic Rivers: No issues drove alternatives.
- National Recreation Trails: No issues drove alternatives.
- Research Natural Areas: The size and locations of proposed RNAs drove alternatives.
- Tenderfoot Creek Experimental Forest: No issues drove alternatives.
- Missouri River Corridor: No issues drove alternatives.
- Smith River Corridor: No issues drove alternatives.
- South Hills Recreation Area- Two primary issues with the South Hills Recreation Area drove alternatives:
  - Identification of this area to support nonmotorized recreation use near Helena.
  - The suitability of mechanized means of transportation (mountain bikes) within IRAs located within portions of the South Hills Recreation Area.
- Elkhorns WMU-Two primary issues in the Elkhorns WMU drove alternatives:

- Mechanized means of transportation (mountain bikes) within the core area of the Elkhorns WMU.
- The request for a Primitive ROS setting for this area.
- Kings Hill Scenic Byway: No issues drove alternatives.
- Badger Two Medicine: Several issues drove alternatives for the Badger Two Medicine area.
  - Primitive ROS for the area
  - The suitability of mechanized means of transportation (mountain bikes) within the Badger Two Medicine. (See alternatives considered but not in detail.)
  - Bison Reintroduction (See alternatives considered but not in detail.)
  - Co-management of the Badger Two Medicine with the Blackfoot Nation. (See alternatives considered but not in detail.)
- Green Timber Basin- Beaver Creek: Inclusion of this area for the protection of unique orchid populations in the area drove an alternative.
- Grandview Recreation Area: Mechanized means of transportation (mountain bikes) as well as over-snow motorized uses in popular areas within the Big Snowy Mountains drove an alternative.

### Measurement indicators

Effects to administratively designated areas resulting from the alternatives were measured using the following:

- Inventoried roadless areas: acres of IRAs within the HLC NF.
- Recommended wilderness areas:
  - Acres of RWAs and their locations
  - Acres of IRAs located within RWAs.
  - Miles of open road, motorized trail, groomed over-snow trail, trails open to mechanized means of transportation, and acres available for motorized over-snow recreation within RWAs.
- Eligible wild and scenic rivers: miles of trail, outstanding remarkable values, and classification of eligible rivers/streams within the HLC NF.
- National recreation trails: names, location, and miles of national recreation trails within the HLC NF.
- Research natural areas: acres and locations of existing and proposed RNAs.
- Tenderfoot Creek Experimental Forest: plan components.
- Missouri River Corridor: plan components.
- Smith River Corridor: plan components.
- South Hills Recreation Area: miles of trail open to mechanized means of transportation within the IRA's within the South Hills Recreation Area.
- Elkhorns Wildlife Management Unit: miles of trail open to mechanized means of transportation in the core area and the ROS settings.
- Kings Hill Scenic Byway: plan components.
- Badger Two Medicine: percent of ROS settings within the Badger Two Medicine.
- Green Timber Basin- Beaver Creek Emphasis Area: acres and location.
- Grandview Recreation Area: miles of nonmotorized trail open to mechanized means of transportation and acres of over-snow motorized use.

### Analysis area

The geographic scope of the analysis varies by the administratively designated area being analyzed. The following describes the analysis area used for each of the administratively designated areas. These analysis



areas will also be used as the geographic scope for cumulative effects. The temporal scope for effects is the life of the plan (15 years).

- Inventoried roadless areas: the HLC NF boundary
- Recommended wilderness areas: the proposed boundaries for each RWAs as developed for each alternative based on the wilderness inventory and evaluation process.
- Eligible wild and scenic rivers: the eligible WSR segments were determined through the WSR process. The analysis area for the rivers includes the identified segments and associated corridor where plan components apply (1/4 mile on either side of the river).
- National recreation trails: the HLC NF forest boundary
- Research natural areas: the HLC NF boundary
- Tenderfoot Creek Experimental Forest: The Tenderfoot Creek Experimental Forest boundary, located within the Little Belts GA
- Missouri River Corridor: All NFS lands within the identified Missouri River Corridor boundary, located within the Big Belts GA
- Smith River Corridor: All NFS lands within the identified Smith River Corridor boundary, located within the Big Belts and Little Belts GAs
- South Hills Recreation Area: All NFS lands in the South Hills Recreation Area boundary, located within the Divide GA
- Elkhorn Wildlife Management Unit: the Elkhorns GA boundary
- Kings Hill Scenic Byway: the length of US Highway 89 in the Little Belts GA
- Badger Two Medicine: All NFS lands within the identified Badger Two Medicine area boundary, located within the Rocky Mountain Range GA
- Green Timber Basin – Beaver Creek Emphasis Area: The Rocky Mountain GA.
- Grandview Recreation Area: The Snowies GA.

### Changes between draft and final

A number of changes to the designated areas section were made for the FEIS; however, all changes are within the scope of the FEIS analysis:

- There were minor wording changes to the plan components in the FEIS.
- There were several minor mapping changes due to more accurate information and data.
- Analysis for alternative F was added in the FEIS. This alternative was based off both internal and external comments to the DEIS. Green Timber Basin-Beaver Creek Emphasis Area and Grandview Recreation Area were added as a result of this review and comment.
- Recommended wilderness areas: The preferred alternative in the final EIS was based on the proposed action, with some changes based upon interagency and public engagement including: (1) moving the recommended wilderness area boundary 300' from all private land boundaries to address concerns related to fire and fuels; (2) selecting plan components that makes motorized and mechanized methods of transportation not suitable in areas being recommended wilderness areas and (3) changing the boundaries of several recommended wilderness areas to accommodate existing recreation uses, including:
  - Nevada Mountain Recommended Wilderness Area: the northern boundary of the Recommended Wilderness Area was moved south to accommodate existing bicycle use on the Helmville-Gould trail, which was kept open in recent travel planning. The eastern boundary was modified to match the IRA boundary.

- Big Snowies Recommended Wilderness Area: creation of the Grandview Recreation Area in the western portion reduced the size of the Recommended Wilderness Area by 32,300 acres.
- Red Mountain Recommended Wilderness Area: added approximately 500 acres to incorporate the entire drainage to the south (instead of cutting off in the middle).

### 3.21.2 Regulatory framework

**1986 Helena NF Plan:** Established the Elkhorns as a Wildlife Management Unit and set up management areas to provide guidance for future activities in the Elkhorn mountain range.

**2001 Roadless Area Conservation Rule (36 CFR 294 Subpart B):** The 2001 Roadless Rule establishes prohibitions on road construction and road reconstruction, and limitations on timber cutting, sale or removal within IRAs on NFS lands. The intent of the 2001 Roadless Rule is to provide lasting protection for IRAs within the NFS in the context of multiple-use management.

**Establishment records for each RNA:** These records provide information on the natural features, plant communities and species present in each RNA, as well as management guidance.

**Public Law 90-542, 82 Stat. 906, as amended (1968) Wild and Scenic Rivers Act:** This act establishes a National Wild and Scenic Rivers System with three classes of river systems: wild, scenic, and recreation. The purpose of the act was to protect the river "...for the benefit and enjoyment of present and future generations." This act also provides interim direction for the management of rivers identified as eligible and/or suitable for designation as wild and scenic rivers by Congress.

**Public Law 90-543 (1968) National Trails System Act:** An act "to promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas and historic resources of the Nation." Establishes three types of trails: 1) the National Scenic Trails, 2) National Recreation Trails and 3) connecting-and-side trails. In 1978 National Historic Trails were also added to the National Trail System. National Scenic Trails and National Historic Trails may only be designated by Congress. National Recreation Trails may be designated by the Secretary of Interior or the Secretary of Agriculture to recognize exemplary trails of local and regional significance in response to an application from the trails managing agency or organization. Through designation, these trails are recognized as part of America's national system trails.

**Region 1 Natural Areas Assessment 1996 (Chadde et al 1996):** Provided an assessment of plant community types needed to fulfill the national spectrum of types to be placed in RNA status in Region 1.

**Tenderfoot Creek Experimental Forest Establishment Report (1961):** Establishes an experimental forest in Tenderfoot Creek on the Lewis and Clark National Forest. Management of the experimental forest and research is conducted by the Rocky Mountain Research Station.

**Trails for America in the 21<sup>st</sup> Century (Executive Order 13195):** Signed by President Clinton in 2001 to achieve the common goal of better establishing and operating America's national system of trails, including national recreation trails.

### 3.21.3 Assumptions

The primary assumption is that these identified administratively designated areas would continue to be managed for their unique and special values for the duration of the plan (approximately 15 years).

### 3.21.4 Best available scientific information used

The HLC NF used the best available data and scientific information to inform the analysis for the Plan components for administratively designated areas on the forest. Data sources included GISs for mapping and site-specific knowledge from forest personnel. All road miles, trail miles and acres are approximate.

### 3.21.5 Inventoried roadless areas, affected environment

IRAs are designated areas under the Roadless Area Conservation Rule (RACR). There are approximately 1,499,181 acres of lands established as official IRAs across the Forest. These IRAs constitute approximately 50% percent of the entire lands administered by the HLC NF. Table 175 identifies each IRA and its location.

**Table 175. IRAs within the HLC NF**

<b>GA</b>	<b>IRA</b>	<b>Acres</b>
Big Belts	Big Log	8,948
Big Belts	Camas Creek	29,168
Big Belts	Cayuse Mountain	20,131
Big Belts	Devils Tower	7,139
Big Belts	Ellis Canyon	5,574
Big Belts	Grassy Mountain	6,734
Big Belts	Hellgate Gulch	16,809
Big Belts	Holter	1,964
Big Belts	Irish Gulch	7,315
Big Belts	Middleman Mtn./Hedges Mtn.	32,282
Big Belts	Mount Baldy	16,349
Total acres in Big Belts GA		152,413
Castles	Castle Mountains	29,386
Total acres in Castles GA		29,386
Crazies	Box Canyon	12,574
Crazies	Crazy Mountains	24,924
Total acres in Crazies GA		37,489
Divide	Electric Peak	27,858
Divide	Jericho Mountain	8,440
Divide	Lazyman Gulch	11,608
Divide	Nevada Mountain <sup>1</sup>	16,085
Total acres in Divide GA		63,991
Elkhorns	Elkhorns	75,415
Total acres in Elkhorns GA		75,415
Highwoods	Highwood Baldy	15,293
Highwoods	Highwoods	24,360
Total acres in Highwoods GA		39,653
Little Belts	Big Baldy	43,102
Little Belts	Bluff Mountain	38,033
Little Belts	Calf Creek	10,100
Little Belts	Eagle Park	5,908
Little Belts	Granite Mountain	10,330
Little Belts	Middle Fork Judith	9,707
Little Belts	Middle Fork Judith WSA	81,069
Little Belts	Mount High	33,461
Little Belts	North Fork Smith	8,438

GA	IRA	Acres
Little Belts	Paine Gulch	7,869
Little Belts	Pilgrim Creek	44,572
Little Belts	Sawmill Creek	11,578
Little Belts	Spring Creek	17,827
Little Belts	Tenderfoot-Deep Creek	85,546
Little Belts	Tollgate-Sheep	24,026
Little Belts	TW Mountain	8,381
Total acres in Little Belts GA		439,947
Rocky Mountain Range	Bear-Marshall-Scapegoat-Swan <sup>1</sup>	395,248
Rocky Mountain Range	Sawtooth	15,687
Total acres in Rocky Mountain Range GA		410,935
Snowies	Big Snowies	9,254
Snowies	Big Snowy Mountains WSA	87,965
Total acres in the Snowies GA		97,219
Upper Blackfoot	Anaconda Hill	18,536
Upper Blackfoot	Bear-Marshall-Scapegoat-Swan <sup>1</sup>	51,339
Upper Blackfoot	Crater Mountain	9,261
Upper Blackfoot	Lincoln Gulch	8,247
Upper Blackfoot	Nevada Mountain <sup>1</sup>	34,027
Upper Blackfoot	Ogden Mountain	12,144
Upper Blackfoot	Silver King-Falls Creek	6,808
Upper Blackfoot	Specimen Creek	12,362
Total acres in Upper Blackfoot GA		152,724
Total IRA Acres on the HLC NF		1,499,181

<sup>1</sup>. Located in more than GA; acres reflected are what are in that particular GA.

### 3.21.6 Inventoried roadless areas, environmental consequences

#### Effects common to all alternatives

All IRA boundaries and acreages within the planning area were firmly established as a part of the 2001 Roadless Rule and would not change in any of the alternatives.

#### Effects common to all action alternatives

Plan components developed for IRAs would remain the same in all action alternatives and provide general guidance for these areas. This guidance would be in addition to the guidance provided in the 2001 Roadless Area Conservation Rule. Table 176 summarizes each plan component related to IRAs. The collective effect of these plan components would be the establishment of management direction for IRAs across the HLC NF.

**Table 176. Summary of plan components for IRAs**

IRA plan component	Summary of plan components for IRAs
FW-IRA-DC-01 FW-IRA-DC-02	These two desired conditions provide high quality soil, water, and air, a diversity of plan and animal communities, and secure habitats for fish and wildlife species. These desired

IRA plan component	Summary of plan components for IRAs
	conditions also provide areas where natural, ecological conditions exist, and contribute to reference landscapes used for future study and research.
FW-IRA-DC-03	This component ensures that high scenic quality is provided in IRAs.
FW-IRA-DC-04	This desired condition would provide remote primitive and semiprimitive (both motorized and nonmotorized) recreation opportunities in IRAs.
FW-IRA-DC-05	This desired condition protects public drinking water, traditional cultural properties and sacred sites, and locally identified unique characteristics.
FW-IRA-SUIT-01	Managing trees for timber production would not be suitable in developed recreation sites; however, trees may be harvested within IRAs outside of WSAs and RWAs to provide for other multiple use values when consistent with the 2001 Roadless Area Conservation Rule.
FW-IRA-SUIT-02	Existing forest system roads in inventoried roadless areas are suitable for motorized and mechanized means of transportation.
FW-IRA-SUIT-03	Restoration activities, such as management ignited fires and active weed management, are suitable within IRAs.

*Effects from forest plan components associated with:*

**Aquatic ecosystems and soil management**

Plan components and management activities for aquatic ecosystems and soil management would have little effect related to the overall management within IRAs. The plan components that may have the greatest influence are those associated with RMZs. East of the Continental Divide (the majority of the HLC NF), RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. West of the Continental Divide, the area influenced by riparian plan components is the same across all alternatives because RMZs would be defined the same way as riparian habitat conservation zones are in the no-action alternative. Please refer to the RMZ section. Vegetation treatments such as prescribed fire and harvest that may occur in IRAs would be limited within RMZs or modified to comply with plan components for those areas. The area on which these components apply is greater with the action alternatives than with the no-action alternative on landscapes east of the Continental Divide.

**Fire and fuels management**

Plan components for fire and fuels management would encourage an appropriate management response to wildfires that may occur within IRAs and provide opportunities for natural fire to promote and/or enhance the undeveloped character within these areas.

**Timber and vegetation management**

IRAs are not suitable for timber production, but timber harvest may occur for other resource purposes. Timber harvest is limited by the 2001 Roadless Area Conservation Rule. Where it does occur, it would consist of cutting small diameter trees. Plan components associated with timber harvest would ensure that all resource protection measures are met. Harvest would be required to meet other plan components, such as SIOs. Plan components related to desired vegetation conditions could influence whether vegetation treatments (such as harvest or management-ignited fires) are conducted and help define the objectives for those treatments.

**Livestock grazing and management**

While livestock grazing has the potential to impact plant communities through factors such as invasive plant spread and damage to riparian areas, plan components emphasize the maintenance of resilient native plant communities as well as desirable riparian area conditions. These components should help protect the ecological integrity of IRAs, to a greater degree with the action alternatives as compared to the no-action alternative.

### Recreation and scenery management

Plan components for recreation settings, opportunities, and access along with scenery management would complement the management of IRAs. In the action alternatives, IRAs have a primitive or semiprimitive ROS setting and a high SIO. These classifications would ensure that potential recreation and other activities, such as restoration treatments, would be consistent with IRA desired conditions.

### Cultural, historic, and tribal resource management

Plan components related to cultural, historic, and tribal resource would have little to no effect on IRAs. The protection of these resources would be consistent with maintaining the wilderness characteristics of these areas.

### Road access and infrastructure

Plan components related to road access and infrastructure would have little effect on IRAs, because these areas are generally unroaded. However, where roads occur, road maintenance activities may occur and would be guided by road access and infrastructure plan components which include protections for other resources. The 2001 Roadless Area Conservation Rule further guides and constrains road construction or reconstruction.

### Minerals management

IRAs are discretionarily unavailable for saleable mineral activities but still open to locatable mineral prospecting, exploration, and development.

### Alternative A, no action

In alternative A, the IRAs on the Forest would be managed under the guidance established by the 2001 Roadless Area Conservation Rule and plan components provided in the 1986 Helena and Lewis and Clark Forest Plans. Table 177 describes the plan components in the 1986 plans that provide direction for IRAs. The collective effect of these plan components would be the establishment of management direction for IRAs across the HLC NF.

**Table 177. Summary of 1986 Plan components for IRAs**

IRA plan components	Summary of 1986 Plan components for IRAs
Helena NF Goals 1 and 2	These plan components provide for a range of outdoor recreation opportunities, including motorized and nonmotorized opportunities.
Helena NF Objectives	A number of roadless areas were identified in the objectives section of the 1986 Forest Plan. Roadless areas and undeveloped areas are well-distributed throughout the Helena Forest and offer semiprimitive recreation opportunity setting experiences.
Helena NF Management Areas R-1 and P-3	Management area R-1 provides direction for large blocks of undeveloped lands suited for dispersed recreation. Motorized uses are not allowed in these areas and they are managed for a semiprimitive nonmotorized ROS setting and experiences. Management area P-3 provides direction for three RWAs which are also IRAs. Under this direction the areas are managed to maintain their existing wilderness characteristics.
Helena NF Forest Plan Amendment 4	This amendment requires the Helena NF to show Allowable Sale Quantities of timber by both roaded and roadless lands on the forest. This amendment also requires a careful accounting of allowable sale quantity that is removed from roadless lands.
Lewis and Clark NF Objectives	An objective for roadless areas recognizes over a million acres of roadless on the Lewis and Clark Forest. Some of these lands lie adjacent to the Bob Marshall and Scapegoat wilderness areas. Some of these lands have been identified as WSAs. The majority of these lands are spread out across the forest and would be managed for their roadless values.

IRA plan components	Summary of 1986 Plan components for IRAs
Lewis and Clark NF Management Areas F, G, and I	Management areas F and G provide direction for blocks of undeveloped land with limited motorized access and semiprimitive recreation opportunity settings. Management area I provides direction for important wildlife habitat on large, undeveloped landscapes that offer semiprimitive recreation settings.
Lewis and Clark NF Amendment 6	This amendment requires the Lewis and Clark NF to show Allowable Sale Quantities of timber by both roaded and roadless lands on the forest. This amendment also requires a careful accounting of allowable sale quantity that is removed from roadless lands.

In alternative A, the following IRA acres fall within identified RWAs. Table 178 shows the IRA acreages that would be affected by RWA designation in alternative A.

**Table 178. Acres of IRAs within RWAs (alternative A)**

IRA (acres)	RWA (acres)	Acres of IRA in RWA
Big Log (8,948)	Big Log (9,139)	8,765
Holter (1,964)	Big Log (9,139)	25
Electric Peak (27,858)	Electric Peak (16,653)	16,587
Mount Baldy (16,349)	Mount Baldy (8,420)	8,414
Total acres of inventoried roadless in RWAs		33,791

### Alternatives B and C

Alternatives B and C identify nine different RWAs across the forest. Approximately 62% of the RWAs are in lands that have been designated as IRAs. While the boundaries and acreages of IRAs within the HLC NF are firmly established and would not change in alternatives B and C, the actions taken in IRAs located within RWAs would follow forest plan components for RWAs. Plan components for RWAs would be more restrictive and would also protect the values of the IRAs.

In alternatives B and C, the following IRA acres fall within identified RWAs. Table 179 shows the IRA acreages that would be affected by RWA designation in alternatives B and C.

**Table 179. Acres of IRAs within RWAs (alternatives B and C)**

IRA (acres)	RWA (acres)	Acres of IRA in RWA
Big Log (8,948)	Big Log (7,086)	6,233
Holter (1,964)	Big Log (7,086)	223
Mount Baldy (16,349)	Mount Baldy (8,314)	8,314
Electric Peak (27,858)	Electric Peak (18,296)	18,043
Tenderfoot-Deep Creek (85,546)	Deep Creek (14,490)	14,490
Big Snowies (9,254)	Big Snowies (95,299)	6,903
Big Snowy Mountains WSA (87,965)	Big Snowies (95,299)	87,669
Bear-Marshall-Scapegoat-Swan (395,248)	Silver King (20,088)	13,070
Silver King - Falls Creek (6,808)	Silver King (20,088)	6,815
Bear-Marshall-Scapegoat-Swan (395,248)	Red Mountain (1,897)	1,786
Bear-Marshall-Scapegoat-Swan (395,248)	Arrastra Creek (8,257)	7,683
Nevada Mountain (50,112)	Nevada Mountain (39,345)	36,205

IRA (acres)	RWA (acres)	Acres of IRA in RWA
Total acres of inventoried roadless in RWAs		207,434

### Alternative D

Additional RWAs are recognized in alternative D, and these areas include many acres of IRAs across the forest. This is in response to the public asking the Forest to consider an alternative that increases the amounts of RWAs on the forest. The boundaries and acreages of IRAs within the HLC NF are firmly established and would not change in alternative D. However, the acres of IRAs that have been identified as RWAs would follow the forest plan components for RWAs. Table 180 shows the acres of IRAs that fall within RWAs in alternative D.

**Table 180. Acres of IRAs within RWAs (alternative D)**

IRA (acres)	RWA (acres)	Acres of IRA within RWA
Big Log (8,948)	Big Log (7,086)	6,233
Holter (1,964)	Big Log (7,086)	223
Camas Creek (29,168)	Camas Creek (22,350)	22,016
Mount Baldy (16,349)	Mount Baldy (8,314)	8,314
Castle Mountains (29,386)	Wapiti Peak (30,606)	28,397
Crazy Mountains (24,924)	Loco Mountain (24,977)	22,222
Electric Peak (27,858)	Electric Peak (26,900)	26,113
Lazyman Gulch (11,608)	Colorado Mountain (14,189)	11,563
Tenderfoot-Deep Creek (85,546)	Deep Creek (14,490)	14,490
Tenderfoot-Deep Creek (85,546)	Tenderfoot Creek (45,870)	38,181
Pilgrim Creek (44,572)	Big Horn Thunder (47,107)	41,131
Middle Fork Judith (9,707)	Middle Fork Judith (62,452)	1,271
Middle Fork Judith WSA (81,069)	Middle Fork Judith (62,452)	59,563
Big Snowies (9,254)	Big Snowies (95,299)	6,903
Big Snowy Mountains WSA (87,965)	Big Snowies (95,299)	87,669
Bear-Marshall-Scapegoat-Swan (395,248)	Silver King (20,088)	13,070
Silver King - Falls Creek (6,808)	Silver King (20,088)	6,815
Bear-Marshall-Scapegoat-Swan (395,248)	Red Mountain (1,897)	1,786
Bear-Marshall-Scapegoat-Swan (395,248)	Arrastra Creek (8,257)	7,683
Nevada Mountain (50,112)	Nevada Mountain (44,774)	37,430
Total acres of inventoried roadless in RWAs		441,073

### Alternative E

All IRAs would be managed under the guidance established by the 2001 Roadless Area Conservation Rule and the plan components established by the Plan.

### Alternative F

Alternative F identifies seven (7) RWAs, and these areas include many acres of IRAs across the forest. The boundaries and acreages of IRAs within the HLC NF are firmly established and would not change in



alternative F. However, the acres of IRAs that have been identified as RWAs would follow plan components for RWAs. Table 181 shows the acres of IRAs that fall within RWAs in alternative F.

**Table 181. Acres of IRAs within RWAs (alternative F)**

IRA (acres)	RWA (acres)	Acres of IRA within RWA
Big Log (8,948)	Big Log (7,035)	6,231
Holter (1,964)	Big Log (7,035)	223
Mount Baldy (16,349)	Mount Baldy (8,141)	8,141
Electric Peak (27,858)	Electric Peak (18,239)	17,987
Big Snowies (9,254)	Big Snowies (66,894)	5,663
Big Snowy Mountains WSA (87,965)	Big Snowies (66,894)	61,017
Bear-Marshall-Scapegoat-Swan (343,910)	Silver King (18,568)	11,625
Silver King - Falls Creek (6,808)	Silver King (18,568)	6,774
Bear-Marshall-Scapegoat-Swan (343,910)	Red Mountain (2,500)	2,065
Nevada Mountain (50,112)	Nevada Mountain (31,571)	30,786
Total acres of inventoried roadless in RWAs		150,512

## Conclusions

The IRA boundaries and acreages were firmly established as a part of the 2001 Roadless Area Conservation Rule and would not change in any of the alternatives.

In alternative A, the IRAs on the Forest would continue to be managed under the guidance established by the 2001 Roadless Area Conservation Rule and the guidance for roadless areas provided by the 1986 Helena and Lewis and Clark Forest Plans.

Plan components developed for IRAs remain the same in all action alternatives and provide general guidance for IRAs on the Forest. This guidance is in addition to the guidance provided in the 2001 Roadless Area Conservation Rule. By providing the plan components outlined in the action alternatives, the HLC NF meets the purpose and need of the Plan, ensuring that the nature and purposes for which IRAs were identified are enhanced and/or protected for present and future generations.

IRAs that fall within RWAs would follow forest plan components for RWAs. Plan components for RWAs would be more restrictive and would also protect the values of the IRAs. IRAs are located within RWAs in Alternatives B, C, D, and F.

### ***3.21.7 Recommended wilderness, affected environment***

RWAs are lands that contain wilderness characteristics and have potential for inclusion in future wilderness designations. These lands are generally free from roads and other constructed features and have high potential to provide solitude and primitive, unconfined recreation. RWAs are also important for species diversity, protection of threatened and endangered species, protection of watersheds, scientific research, and various social values.

The 1986 Helena Forest Plan identifies and provides management direction for three RWAs: Electric Peak, Big Log, and Mount Baldy. These RWAs total approximately 34,212 acres. Of the three, Big Log lies adjacent to the Gates of the Mountains Wilderness area. Both Big Log and Mount Baldy are completely located in the HLC NF. Only a portion of the Electric Peak RWA lies within the HLC NF. The remainder of Electric Peak

RWA is in the Beaverhead-Deerlodge NF. Table 182 identifies the three existing RWAs, the GAs in which they are located, and the number of acres for each.

**Table 182. 1986 Helena Forest Plan RWAs**

RWA	GA	Adjacent designated wilderness	Total acres	Acres on the HLC NF
Electric Peak	Divide <sup>1</sup>	N/A	21,556	16,653
Big Log	Big Belts	Gates of the Mountains	9,139	9,139
Mount Baldy	Big Belts	N/A	8,420	8,420
Total acres of RWAs in the planning area				34,212

<sup>1</sup> A portion of the Electric Peak RWA is located on the Beaverhead-Deerlodge NF.

### 3.21.8 Recommended wilderness, environmental consequences

#### Effects common to all alternatives

In all alternatives, natural disturbances, recreation use patterns, and emerging technologies would continue to influence the wilderness characteristics of undeveloped landscapes on the HLC NF.

Any type of trail, whether for hikers or horseback riders, could affect the undeveloped wilderness characteristics (ecological characteristic) because a trail is considered a development. Solitude could be affected by noise but could also be affected by encounters with other people who are hiking or horseback riding, particularly if they are traveling in large groups.

#### Effects common to all action alternatives

Most of the plan components included in the Plan and their associated effects for recommended wilderness areas are common to all action alternatives, as described in Table 183. There are several key exceptions. First, an additional plan component (FW-RECWILD-SUIT-01) is included in the Plan, but its content varies by alternative. This plan component and expected effects are discussed in the subsequent sections for each alternative. In addition, there are no RWAs in alternative E; in this alternative, none of the RWA plan components would apply.

**Table 183. Summary of plan components for RWAs that are common to alternatives B, C, D, and F**

RWA plan component	Summary of plan components for RWAs
FW-RECWILD-DC-01	This DC ensure that the identified wilderness characteristics, both social and ecological, of the RWAs are protected and preserved.
FW-RECWILD-DC-02	This DC describes the ecological conditions in RWAs, to include natural processes such as natural successions, wildfire, avalanches, and insects and diseases.
FW-RECWILD-DC-03	This DC ensures that RWAs provide outstanding opportunities for solitude or primitive and unconfined recreation.
FW-RECWILD-STD-01	This STD ensures that new leases for leasable minerals shall include a no surface occupancy stipulation.
FW-RECWILD-SUIT-02	This plan component states that restoration activities, such as management ignited fire and active weed management, are suitable within RWAs.
FW-RECWILD-SUIT-03	This plan component ensures that the use of motorized equipment, such as chain saws, is suitable within RWAs to achieve restoration activities and administrative work.
FW-RECWILD-SUIT-04 FW-RECWILD-SUIT-05 FW-RECWILD-SUIT-06 FW-RECWILD-SUIT-07	These components provide direction for timber production, timber harvesting, new commercial communication sites, new utility corridors, road construction, road reconstruction, and developed recreation sites and facilities within RWAs. None of these actions are suitable in RWAs.

RWA plan component	Summary of plan components for RWAs
FW-RECWILD-SUIT-08	This plan component allows for existing livestock grazing allotments but prohibits new or expanded livestock grazing allotments within RWAs.

*Effects from forest plan components associated with:*

**Aquatic ecosystems and soil management**

Plan components and management activities for aquatic ecosystems and soil management would have little effect related to the overall management within RWAs. The plan components that may have the greatest influence are those associated with RMZs. East of the Continental Divide (the majority of the HLC NF), RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. West of the Continental Divide, the area influenced by riparian plan components is the same across all alternatives because RMZs would be defined the same way as riparian habitat conservation zones are in the no-action alternative. Please refer to the RMZ section. The potential effects of RMZ plan components to recreation opportunities within RWAs are discussed in the recreation opportunities section.

Little to no active management would occur in RWAs. However, restoration treatments such as prescribed fire that would occur in RWAs may be limited within RMZs or modified to comply with plan components for those areas. The area on which these components apply is greater with the action alternatives than with the no-action alternative on landscapes east of the continental divide; however, the effect would be minor and insubstantial with regards to the wilderness characteristics of RWAs.

**Fire and fuels management**

Plan components for fire and fuels management would encourage an appropriate management response to wildfires that may occur within RWAs and provide opportunities for natural fire to promote and/or enhance the wilderness characteristics of these areas. Fire and fuels management plan components also specify the use of minimum impact strategies and tactics to manage wildland fire within RWAs, which would further protect wilderness characteristics.

**Timber and vegetation management**

There would be no effect to RWAs from plan components related to timber harvest because no timber harvest would be allowed in these areas. Plan components related to desired vegetation conditions could influence whether restoration treatments (such as management-ignited fires) are conducted in RWAs and help define the objectives for those treatments. Vegetation management activities such as planting of whitebark pine would also be allowed in RWAs. These plan components would help promote and/or enhance the wilderness characteristics of these areas.

**Livestock grazing and management**

The plan components for the action alternatives do not allow for new or expanded livestock grazing allotments to occur within RWAs; however, existing allotments may be retained. Therefore, the plan components that guide livestock grazing and management would influence RWAs. Livestock grazing has the potential to impact plant communities through factors such as invasive plant spread and damage to riparian areas. However, plan components emphasize the maintenance of resilient native plant communities as well as desirable riparian area conditions. These components would help protect the wilderness characteristics of RWAs, to a greater degree with the action alternatives as compared to the no-action alternative.

**Wildlife habitat management**

Plan components related to wildlife habitat management would have little to no effect on RWAs.

### Recreation and scenery management

Plan components for recreation settings, opportunities, and access along with scenery management would complement the management of RWAs for their wilderness characteristics. In the action alternatives, RWAs have a primitive ROS setting and a very high SIO. These classifications would ensure that potential recreation and other activities, such as restoration treatments, would be consistent with RWAs desired conditions.

### Cultural, historic, and tribal resource management

Plan components related to cultural, historic, and tribal resource would have little to no effect on RWAs. The protection of these resources would be consistent with maintaining the wilderness characteristics of these areas.

### Road access and infrastructure

Plan components related to road access and infrastructure would have little to no effect on RWAs, because RWAs would not be suitable for road construction or reconstruction and these areas are generally unroaded.

### Minerals management

If these areas were to become Congressionally designated wilderness areas RWAs would be discretionarily unavailable for mineral leasing.

Saleable mineral activity would not be suitable in RWAs, but they are still open to locatable mineral prospecting, exploration, and development.

### Alternative A, no action

There are currently three RWAs on the HLC NF: Big Log, Mount Baldy, and Electric Peak. These RWAs would be managed under the 1986 Helena Forest Plan in alternative A. Table 184 describes the plan component in the 1986 Helena Forest Plan that provides direction for the three RWAs.

**Table 184. Summary of the 1986 Helena Forest Plan component for RWAs (alternative A)**

Plan component	Summary of 1986 plan component for RWAs
1986 Helena NF Plan, Management Area P-3, Pages III/73 through III/77	This management area provides direction for maintenance of existing wilderness characteristics in the three RWAs.

There are currently approximately 4 miles of open road, 0.1 mile of motorized trail, 37 miles of trail open to mechanized means of transportation, and 131 acres open to motorized over-snow uses in these RWAs. Mechanized means of transportation and motorized recreation uses affect the undeveloped nature and primitive recreation of these RWAs. In addition, the sounds of motorized recreation use, such as snowmobiling or motorized trail use, may impact the RWA's solitude and primitive recreation experiences. Existing summer and winter travel plans provide the direction for where motorized uses can and cannot occur across the forest, including within the RWAs.

There would be no displacement of motorized and mechanized means of transportation from these RWAs.

### Alternative B

Alternative B identifies nine (9) areas to be RWAs. These RWAs were identified after the HLC NF conducted a wilderness inventory and evaluation. Identifying an area as RWA in the Plan does not create a wilderness, as only Congress has the right to designate wilderness by passing legislation. However, the nine RWAs identified in alternative B would be managed to protect their wilderness characteristics. The nine RWAs in alternative B are located within five GAs and total approximately 213,170 acres. These RWAs were derived from the wilderness inventory polygons identified in the first step of the wilderness evaluation process, but do not necessarily include all those original acres. Boundaries for the individual RWAs are located on naturally

occurring ridgelines, stream bottoms, or other locatable features on the landscape. Table 185 provides the name of each RWA in alternative B, the inventory polygon it originated from, the GA in which it is located, whether it lies adjacent to existing designated wilderness, and the approximate acres of the RWA.

**Table 185. Recommended wilderness (alternative B)**

RWA	Wilderness inventory polygon	GA	Adjacent designated wilderness	Acres	Percent of total forest acres
Big Log	BB1	Big Belts	Gates of the Mountains	7,086	0.2
Mount Baldy	BB7	Big Belts	NA	8,314	0.3
Electric Peak	D3	Divide	NA	18,296	0.6
Deep Creek	LB1	Little Belts	NA	14,490	0.5
Big Snowies	S1	Snowies	NA	95,299	3.3
Silver King	UB1	Upper Blackfoot	Scapegoat	20,088	0.7
Red Mountain	UB2a	Upper Blackfoot	Scapegoat	1,897	0.1
Arrastra Creek	UB2b	Upper Blackfoot	Scapegoat	8,257	0.3
Nevada Mountain	UB10	Upper Blackfoot and Divide	NA	39,443	1.4
Total				213,170	7.4

The suitability for motorized and mechanized means of transportation is established by FW-RECWILD-SUIT-01. For alternative B (as well as D and F), this plan component states that these uses are not suitable in RWAs (Table 186). This along with the plan components that are common to all action alternatives (Table 183) provides the overall management direction for RWAs on the HLC NF in this alternative. The collective effect of these plan components would be the establishment of management direction that would protect the wilderness characteristics of the RWAs.

**Table 186. Summary of plan component not common to all action alternatives for RWAs (alternatives B, D and F)**

RWA plan component	Summary of plan components for RWAs
FW-RECWILD-SUIT-01 (Alternative B and D)	This plan component prohibits motorized recreation uses and mechanized means of transportation within RWAs, except for authorized permitted users, valid existing rights, or in emergencies related to public health and safety. Exceptions are established on a case-by-case basis.

In alternative B, motorized and mechanized means of transportation would not be suitable in RWAs. This is a change from the existing condition. Currently, motorized and/or mechanized means of transportation (including bicycles) may be found on approximately 13 miles of road, 0.1 mile of motorized trail, 24,403 acres of motorized over snow areas, and 204 miles of nonmotorized trails found in the RWAs in this alternative. This reduction in suitability for motorized and mechanized means of transportation would improve the wilderness characteristics of solitude and primitive recreation experience.

RWAs are characterized as generally being without permanent improvements or human occupation. Motorized and mechanized means of transportation have the potential to affect the undeveloped nature and primitive recreation characteristics of these areas. In addition, the sounds of motorized recreation use, such as snowmobiling or motorized trail use, can impact solitude and primitive recreation. Further, increasing population, with resulting increasing demands and pressures on public lands, may impact RWAs. Generally, populations are increasing in the counties on the west side of the HLC NF but are declining or stable in other

areas (please see social/economic section). These changes may lead to increased demands for recreational use, including motorized and mechanized means of transportation in RWAs. This pressure elevates the importance of protecting wilderness characteristics. Alternative B minimizes or avoids these impacts to wilderness characteristics by establishing that motorized and mechanized means of transportation would not be suitable within RWAs (FW-RECWILD-SUIT-01 as described in Table 186).

Displacement of motorized recreation uses and mechanized means of transportation (including bicycles) from RWAs may occur in alternative B. The loss of suitability for these uses may concentrate motorized and mechanized means of transportation uses in other areas identified as suitable for them, because these recreational activities would likely move to other nearby areas on the forest.

For a more detail discussion of the specific roads, trail, and areas affected by the changes in suitability in alternative B, please see the Recreation Access – Potential Direct Effects to Recreation Access section.

**Alternative C**

Alternative C also identifies nine (9) RWAs. These RWAs are the same as those identified in alternative B; see Table 185. The expected effects of the RWA plan components for alternative C are the same as alternative B except that motorized and mechanized means of transportation (including bicycles) within RWAs would be suitable in alternative C. Table 187 provides a summary of FW-RECWILD-SUIT-01 in alternative C. All other plan components would be the same as described in Table 183 for alternative B. The collective effect of these plan components would be the establishment of management direction that would protect the wilderness characteristics of these RWAs.

**Table 187. Summary of plan component not common to all action alternatives for RWAs (alternative C)**

RWA plan component	Summary of plan component for RWA (alternative C)
FW-RECWILD-SUIT-01 (Alternative C)	This plan component provides direction allows motorized and mechanized means of transportation (including bicycles) to occur within RWAs. Motorized recreation uses would continue to be governed by current and updated summer and winter travel plans.

In alternative C, existing and/or updated travel plans would provide direction for where motorized uses would occur and would not occur. Mechanized means of transportation would be suitable on all nonmotorized trails within the RWAs. These uses may affect the undeveloped nature and primitive recreation of these RWAs. In addition, the sounds of motorized recreation use, such as snowmobiling or motorized trail use, may impact the RWA’s solitude and primitive recreation experiences. However, not every person traveling through the RWAs in alternative C would meet a mountain biker or motorized user as these areas are remote and currently have relatively low levels of recreation use.

RWAs are characterized as generally being without permanent improvements or human occupation. Motorized and mechanized means of transportation have the potential to affect the undeveloped nature and primitive recreation characteristics of these areas. In addition, the sounds of motorized recreation use, such as snowmobiling or motorized trail use, can impact solitude and primitive recreation. Further, population increases in the western portions of the HLC NF may increase recreational use of the Forest, including use within RWAs. The effects of urbanization and population growth on RWA use and resource conditions are likely to be gradual and to extend well beyond the planning period. Increased recreational use may negatively affect wilderness characteristics, particularly the opportunity for solitude and natural quality. These effects are not minimized or avoided in alternative C because motorized use and mechanized means of transportation are suitable. Examples of potential impacts include increased opportunity for crowding in certain locations, soil compaction or erosion, and threats to native plant species from the spread of noxious weeds from sources outside the area.

There would be no displacement of motorized and mechanized means of transportation from these RWAs.

## Alternative D

Alternative D responds to comments received from the public asking the Forest to consider an alternative that increased the number of RWAs and primitive recreation opportunities on the forest. Alternative D identifies sixteen (16) areas as RWAs. These RWAs include the nine areas identified for alternatives B and C as well as seven additional areas with wilderness characteristics. Additional acreages were also added to the Nevada Mountain and Electric Peak RWAs in this alternative. In total, the RWAs in alternative D are located across seven GAs and total approximately 474,658 acres. All the RWAs were derived from the original wilderness inventory polygons identified in the first step of the wilderness evaluation process, but do not necessarily include all of the original acres of those wilderness inventory polygons. For specific boundary locations of RWAs, see maps provided in appendix A. Table 188 describes the RWA polygons and acres associated with RWAs identified in alternative D.

**Table 188. Recommended wilderness in alternative D**

<b>RWA</b>	<b>Wilderness inventory polygon</b>	<b>GA</b>	<b>Adjacent designated wilderness</b>	<b>Acres</b>	<b>Percent of total forest acres</b>
Big Log	BB1	Big Belts	Gates of the Mountains	7,086	0.2
Camas Creek	BB6	Big Belts	NA	22,350	0.7
Mount Baldy	BB7	Big Belts	NA	8,314	0.3
Wapiti Peak	CA1	Castles	NA	30,606	1
Loco Mountain	CR1	Crazies	NA	24,977	1
Electric Peak	D3	Divide	NA	26,900	1
Colorado Mountain	D5	Divide	NA	14,189	0.5
Deep Creek	LB1a	Little Belts	NA	14,490	0.5
Tenderfoot Creek	LB1b	Little Belts	NA	45,870	1.5
Big Horn Thunder	LB 2	Little Belts	NA	47,107	1.6
Middle Fork Judith	LB16	Little Belts	NA	62,452	2.2
Big Snowies	S1	Snowies	NA	95,299	3.3
Silver King	UB1	Upper Blackfoot	Scapegoat	20,088	0.7
Red Mountain	UB2a	Upper Blackfoot	Scapegoat	1,897	0.1
Arrastra Creek	UB2b	Upper Blackfoot	Scapegoat	8,257	0.3
Nevada Mountain	UB10	Upper Blackfoot and Divide	NA	44,774	1.6
<b>Total</b>				<b>474,658</b>	<b>16.5</b>

Similar to alternative B, motorized recreational uses and mechanized means of transportation (including bicycles) would not be suitable in RWAs in alternative D. Currently, these uses may be found on approximately 34 miles of road, 60.1 miles of motorized trail, 79,194 acres of motorized over-snow uses, and 328 miles of nonmotorized trails in these areas. This reduction in suitability for motorized and mechanized means of transportation would improve the wilderness characteristics of solitude and primitive recreation experience.

RWAs are characterized as generally being without permanent improvements or human occupation. Motorized and mechanized means of transportation have the potential to affect the undeveloped nature and primitive recreation characteristics of these areas. In addition, the sounds of motorized recreation use, such as snowmobiling or motorized trail use, can impact solitude and primitive recreation. Further, increasing

population, with resulting increasing demands and pressures on public lands, may impact RWAs. Generally, populations are increasing in the counties on the west side of the HLC NF but are declining or stable in other areas (please see social/economic section). These changes may lead to increased demands for recreational use, including motorized and mechanized means of transportation in RWAs. This pressure elevates the importance of protecting wilderness characteristics. Alternative D minimizes or avoids these impacts to wilderness characteristics by establishing that motorized and mechanized means of transportation would not be suitable within RWAs (FW-RECWILD-SUIT-01 as described in Table 186).

Displacement of motorized recreation uses and mechanized means of transportation (including bicycles) from RWAs may occur in alternative D. The loss of suitability for these uses may concentrate motorized and mechanized means of transportation uses in other areas identified as suitable for them, because these recreational activities would likely move to other nearby areas on the forest.

Two of the RWAs in alternative D are planned to have timber harvesting occur within them in the relatively short-term: Colorado Mountain RWA and Wapiti Peak RWA. Vegetative treatments for these projects have been designed to improve the ecological integrity of these areas in the long term thereby supporting the wilderness characteristics of healthy functioning ecosystems. However, in the short-term visual effect of these treatment may be substantially noticeable. No permanent constructed features would remain on the landscape in these areas after the vegetative treatments are complete. Refer also to the timber section.

For a more detailed discussion of the specific roads, trails, and areas that affected by the suitability changes in alternative D, please see the Recreation Access – Direct Effects section.

## Alternative E

Alternative E responds to comments received from public comments asking the Forest to consider an alternative that does not identify RWAs and increases the amount of forest lands available for timber production. In response to these comments, alternative E does not include any RWAs.

In alternative E, there would no longer be RWA on the forest and the three existing RWAs (Big Log, Mount Baldy, and Electric Peak) would no longer be designated as such. These areas would no longer be managed for their wilderness characteristics. Since all three of these areas are also IRA's they would be managed for their unroaded character but would be subject to management practices allowable in IRAs (please see the plan components for IRAs.) The wilderness characteristics in these three areas would not be fully protected and/or enhanced in alternative E.

The miles of open road, motorized trail, nonmotorized trail, and acres suitable for motorized over-snow uses would be the same as those found in alternative A, the no-action alternative. Existing travel plans would continue to provide direction for where motorized recreation uses would occur. Mechanized means of transportation would continue to be suitable on roads and trails throughout the HLC NF, including in the three areas that were once RWAs. There would be no plan components for RWAs in alternative E; wilderness characteristics would not be managed for in any of the areas identified as RWAs in the other alternatives.

There would be no displacement of existing motorized and mechanized means of transportation.

## Alternative F

Alternative F responds to public comments and aims to provide a mix between providing RWA and managing for other resource values. Alternative F identifies seven (7) areas as RWAs. Identifying an area as RWA in the Plan does not create a wilderness, as only Congress has the right to designate wilderness by passing legislation. However, the seven RWAs identified in alternative F would be managed to protect their wilderness characteristics and natural processes.



The RWAs in alternative F are located within five GAs and total approximately 152,948 acres. These RWAs were derived from the wilderness inventory polygons identified in the first step of the wilderness evaluation process, but do not necessarily include all those original acres. When possible, boundaries for the individual RWAs are located on naturally occurring ridgelines, stream bottoms, or other locatable features on the landscape to make them more manageable. In this alternative, all boundary lines near private lands were also adjusted to provide a 300-foot set back allowing the HLC NF the opportunity to manage unplanned fire and fuel breaks near private properties. Table 189 provides the name of each RWA in alternative F, the inventory polygon it originated from, the GA in which it is located, whether it lies adjacent to existing designated wilderness, and the approximate acres of the RWA.

**Table 189. Recommended wilderness (alternative F)**

RWA	Wilderness inventory polygon	GA	Adjacent designated wilderness	Acres	Percent of total forest acres
Big Log	BB1	Big Belts	Gates of the Mountains	7,035	0.2
Mount Baldy	BB7	Big Belts	NA	8,141	0.3
Electric Peak	D3	Divide	NA	18,239	0.6
Big Snowies	S1	Snowies	NA	66,894	2.3
Silver King	UB1	Upper Blackfoot	Scapegoat	18,568	0.6
Red Mountain	UB2a	Upper Blackfoot	Scapegoat	2,500	0.1
Nevada Mountain	UB10	Upper Blackfoot and Divide	NA	31,571	1.1
Total				152,948	5.2

As in alternatives B and D, motorized and mechanized means of transportation would be unsuitable in RWAs in alternative F. This is a change from the existing condition on the landscape; currently, these uses may be found on approximately 8 miles of road, 0.1 mile of motorized trail, 8,046 acres of motorized over-snow uses, and 135 miles of nonmotorized trails within the identified RWAs. This reduction in suitability for motorized and mechanized means of transportation would improve the wilderness characteristics of solitude and primitive recreation experience.

RWAs are characterized as generally being without permanent improvements or human occupation. Motorized and mechanized means of transportation have the potential to affect the undeveloped nature and primitive recreation characteristics of these areas. In addition, the sounds of motorized recreation use, such as snowmobiling or motorized trail use, can impact solitude and primitive recreation. Further, increasing population, with resulting increasing demands and pressures on public lands, may impact RWAs. Generally, populations are increasing in the counties on the west side of the HLC NF but are declining or stable in other areas (please see social/economic section). These changes may lead to increased demands for recreational use, including motorized and mechanized means of transportation in RWAs. This pressure elevates the importance of protecting wilderness characteristics. Alternative F minimizes or avoids these impacts to wilderness characteristics by establishing that motorized and mechanized means of transportation would not be suitable within RWAs (FW-RECWILD-SUIT-01 as described in Table 186).

Displacement of motorized recreation uses and mechanized means of transportation (including bicycles) from RWAs may occur in alternative F. The loss of suitability for these uses may concentrate motorized and mechanized means of transportation uses in other areas identified as suitable for them, because these recreational activities would likely move to other nearby areas on the forest.

The plan components for alternative F are the same as those for alternative B and are summarized in Table 183. These plan components provide overall management direction for RWAs on the HLC NF.

For a more detailed discussion of the specific roads, trails, and areas that affected by the suitability changes in alternative D, please see the Recreation Access – Direct Effects section.

## Conclusions

In alternative A, the HLC NF would continue to manage three RWAs, for an estimated total of 34,212 acres, as per the guidance found in the 1986 Helena NF Plan. Direction for motorized recreation uses within these areas would be provided by existing travel plans. Mechanized means of transportation would be suitable on existing roads and trails. Wilderness characteristics would be protected but not fully because motorized and mechanized means of transportation would be suitable in RWAs.

All of the action alternatives (alternatives B, C, D, E, and F) meet the purpose and need because they are consistent with the 2012 Planning Rule and associated directives, which provides direction to complete a wilderness inventory and evaluation process to determine lands with wilderness characteristics that may be suitable for inclusion in the National Wilderness Preservation System when conducting a forest plan revision.

Alternatives A, B, C, D and F identify RWAs in various locations across the HLC NF. Several of these RWAs (Big Log, Red Mountain, Silver King, and Arrastra Creek) are located adjacent to existing designated wilderness. By locating the RWAs adjacent to existing designated wilderness, the opportunities for solitude and primitive unconfined recreation would be extended into a much larger landscape thereby improving the overall wilderness characteristics of the RWAs but supporting the wilderness character of the designated wilderness areas as well. Alternative E does not identify any RWAs and therefore does not contribute to wilderness characteristics adjacent to designated wilderness or across larger landscapes.

Increasing population, with resulting increasing demands and pressures on public lands, may potentially have impact on recommended wilderness areas. Generally, populations are increasing in the counties on the west side of the HLC NF but are declining or stable in other areas (please see social/economics report for more details). These changes may lead to increased demands for recreational use, including motorized and mechanized means of transportation in RWAs. This pressure elevates the importance of protecting wilderness characteristics. To ensure that “an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States” (“Wilderness Act - Public Law 88-577 (16 U.S. C. 1131-1136),” 1964), alternatives B, D, and F include a plan component identifies motorized uses and mechanized means of transportation unsuitable in RWAs. The suitability plan component supports the wilderness characteristics across RWAs and designated wilderness by reducing noise and improving opportunities for solitude and/or primitive unconfined recreation across larger landscape areas.

Alternatives B and C identify nine (9) areas to be RWAs for a total of approximately 213,170 acres. These nine RWAs would be managed to protect their wilderness characteristics. In response to public comment, sixteen (16) RWAs would be identified in alternative D, for a total of approximately 474,658 acres. These sixteen areas would be managed to protect their wilderness characteristics. In alternatives B, C, and D, the boundaries for the individual RWAs would be located on naturally occurring ridgelines, stream bottoms, or other locatable features on the landscape.

In response to public comment, alternative E would not identify any lands as RWAs.

Alternative F identifies seven (7) RWA for a total of approximately 152,948 acres. When possible, boundaries for the RWAs are located on naturally occurring ridgelines, stream bottoms, or other locatable features on the landscape to make them more manageable. However, in this alternative, all boundary lines near private lands were adjusted to provide a 300-foot set back allowing the HLC NF the opportunity to manage unplanned fire and fuel breaks near these private properties.

In alternatives B, D, and F motorized and mechanized means of transportation within RWAs would not be suitable. As a result, wilderness characteristics would be protected and enhanced to a greater degree than in the other alternatives. In alternative C, motorized and mechanized means of transportation would be suitable within RWAs. Table 190 summarizes the acres suitability within RWAs by alternative.

**Table 190. Summary of acres and suitable uses within RWAs by alternative**

Alternative	Number of RWAs	Acres <sup>1</sup>	Motorized uses	Mechanized means of transportation
A	3	34,212	Suitable per existing travel plans	Suitable
B	9	213, 170	Not suitable	Not suitable
C	9	213, 170	Suitable	Suitable
D	16	474,658	Not suitable	Not suitable
E	0	0	Not applicable	Not applicable
F	7	152,948	Not suitable	Not suitable

<sup>1</sup> All acres are approximate.

Identifying an area as a RWA through a forest plan does not create a wilderness, as only Congress has the right to designate wilderness by passing legislation. However, identified RWAs would be managed for their wilderness characteristics until such time as Congress makes further decision on their long-term management.

### ***3.21.9 Eligible wild and scenic rivers, affected environment***

In 2015, under the direction of the 2012 Planning Rule (36 CFR Part 219), a WSRs eligibility study was conducted on the HLC NF. The 2015 eligibility study process included the review of all named and free-flowing streams/rivers within the HLC NF and a determination of whether these streams/rivers had any outstandingly remarkable values. After the completion of the study, the HLC NF identified 45 rivers as eligible for inclusion into the wild and scenic rivers system as outlined in the Wild and Scenic Rivers Act. The eligible WSRs identified in the Plan are only on NFS lands. Rivers and segments of rivers that pass through private lands were not considered in the eligibility study.

For a river to be eligible for WSR designation it must (1) be free-flowing, and (2) possess at least one outstandingly remarkable value.

Once identified, a corridor of ¼ mile either side of the eligible river/river segment is identified for the protection and management of the WSR-related values. For management purposes, eligible WSR segments are classified as wild, scenic, or recreational.

- Wild – Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted.
- Scenic – Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- Recreational – Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Table 191 identifies the eligible rivers, the outstandingly remarkable values present, the preliminary classification, and the mileage associate with each river. The list of streams in the table is organized geographically by watershed from north to south, east to west, in most cases. For information about the WSRs eligibility study, including maps and documentation, see appendix F.

**Table 191. Eligible wild and scenic rivers by GA**

River name	Segment description	Miles	Classification	Outstanding remarkable values	Past eligibility notes
Big Belts GA					
Beaver Creek	<u>Segment 1:</u> From mouth to private land boundary.	3.4	Recreational	Recreation Geology Cultural	Eligible in 1989 for Fish.
	<u>Segment 2:</u> From private boundary to private boundary.	0.7	Recreational		
	<u>Segment 3:</u> From private boundary to confluence with Bridge Creek, west of Nelson.	1.4	Recreational		
	<u>Segment 4:</u> From confluence with Sheep Gulch to confluence with Pike Creek	3.7	Recreational		
White Creek	From where stream crosses section line between T20N R2E Sections 19 and 20 west to private boundary.	3.0	Recreational	Fish	
Missouri River	From Hauser Dam to confluence with Cochran Gulch.	2.2	Recreational	Recreation (Fishing) Geology Wildlife	Eligible in 1989 for Rec, Geology, Fish, Wildlife, and Natural.
Ray Creek	From FS boundary to headwaters.	3.4	Scenic	Fish	
Divide GA					
Little Blackfoot River	<u>Segment 1:</u> From private boundary to private boundary near Charter Oaks.	0.8	Recreational	Fish Cultural	Eligible in 1989 for Fish.
	<u>Segment 2:</u> From private land boundary south to the next private land boundary.	0.5	Recreational		
	<u>Segment 3:</u> From private land boundary south and west to the private land boundary northeast of Kading campground.	4.4	Recreational		
	<u>Segment 4:</u> From private land boundary south to the confluence with a no name stream near the intersection of Trail 329 and Trail 326.	1.3	Recreational		
	<u>Segment 5:</u> From the confluence with a no name stream near the intersection	7.7	Wild		

River name	Segment description	Miles	Classification	Outstanding remarkable values	Past eligibility notes
	of Trail 329 and Trail 326 to the headwaters.				
High Ore Creek	From FS boundary to headwaters.	1.0	Scenic	Fish	
Kady Gulch	From FS boundary to private land boundary.	1.1	Recreational	Fish	
South Fork Quartz Creek	From mouth to private land boundary.	2.2	Recreational	Fish	
Skelly Gulch	From FS boundary to headwaters.	2.5	Scenic	Fish	
Elkhorns GA					
Staubach Creek	From private land boundary to headwaters.	2.4	Scenic	Fish	
Highwoods GA					
North Fork Highwood Creek	From fish barrier to headwaters.	3.3	Scenic	Fish	
Big Coulee Creek	<u>Segment 1:</u> From the fish barrier to the confluence with a no name stream from the east.	0.3	Scenic	Fish	
	<u>Segment 2:</u> From the confluence with the no name creek to the upper tributary fork.	1.6	Wild	Fish	
Cottonwood Creek	From FS boundary to headwaters.	2.5	Scenic	Fish	
North Fork Little Belt Creek	From FS boundary to headwaters.	2.1	Wild	Fish	
Little Belts GA					
Pilgrim Creek	<u>Segment 1:</u> From fish barrier south to the private land boundary.	7.2	Scenic	Fish	
	<u>Segment 2:</u> From private land boundary to the headwaters.	3.7	Scenic	Fish	
Middle Fork Judith River	<u>Segment 1:</u> From FS boundary to private land boundary.	1.6	Recreational	Cultural	Eligible in 1989 for Cultural.
	<u>Segment 2:</u> From private land boundary to confluence with Big Arch Coulee.	3.0	Recreational		
South Fork Judith River	<u>Segment 1:</u> From confluence with Bower Creek to	3.6	Recreational	Fish Cultural	

River name	Segment description	Miles	Classification	Outstanding remarkable values	Past eligibility notes
	confluence with Dry Pole Creek.	7.4	Scenic		
	<u>Segment 2:</u> From confluence with Bluff Mountain Creek to confluence with a no name creek.	3.9	Recreational		
	<u>Segment 3:</u> From confluence with a no name creek to the headwaters.				
Smith River (FS lands only)	The Smith River is comprised of 17 small segments of Forest Service lands interspersed with private lands. Only Forest Service lands are considered for eligibility. To view individual segments, see detail maps located in the summary.	17.8	Scenic	Scenic Recreation Geology Wildlife Cultural	Eligible in 1989 for Rec, Scenery, Geology, Fish, Wildlife and Cultural.
	Segment 1: From private land boundary to private land boundary.	14.6	Scenic		
	Segment 2: From private land boundary to private land boundary	0.7	Scenic		
	Segment 3: From private land boundary to private land boundary.	0.1	Scenic		
	Segment 4: From private land boundary to confluence with Iron Mines Creek.	4.9	Scenic		
				Recreation Fish	Eligible in 1989 for Fish.
<b>Rocky Mountain Range GA</b>					
	<u>Segment 1:</u> From FS boundary to confluence with Box Creek.	3.4	Wild		
	<u>Segment 2:</u> From private land boundary to headwaters.	9.5	Wild		
South Fork Two Medicine River				Scenery Cultural	
Badger Creek	From FS boundary to the confluence with North and South Badger Creeks.	7.3	Wild	Cultural Scenery	
North Badger Creek	From the mouth to the headwaters.	10.4	Wild	Fish Cultural	Eligible in 1989 for Fish.
South Badger Creek	From the mouth to the headwaters.	10.9	Wild	Cultural	
Lee Creek	From the mouth to the headwaters.	4.6	Wild	Fish	

River name	Segment description	Miles	Classification	Outstanding remarkable values	Past eligibility notes
Badger Cabin Creek	From the mouth to the headwaters.	3.2	Wild	Fish	
Red Poacher Creek	From the mouth to the headwaters.	3.1	Wild	Fish	
North Fork Birch Creek	From FS boundary to headwaters.	7.8	Wild	Cultural Scenery	Eligible in 1989 for Scenery and Geology.
Middle Fork Birch Creek	From the mouth to the headwaters.	5.2	Wild	Scenery Cultural	
South Fork Birch Creek	From the entrance into Swift Reservoir to the headwaters.	9.8	Wild	Scenery Recreation Fish Wildlife Cultural	
North Fork Deep Creek	From FS boundary to headwaters.	5.5	Wild	Scenery	
North Fork Teton River	<u>Segment 1:</u> From FS Boundary to FSR #114 road crossing north of Elko Campground (bottom of the box canyon).	5.5	Recreation	Recreation Scenery Wildlife Fish	
	<u>Segment 2:</u> From FSR #114 road crossing north of Elko Campground to the Bob Marshall Wilderness boundary	5.3	Scenic		
	<u>Segment 3:</u> From the Bob Marshall Wilderness boundary to the headwaters.	6.4	Wild		
Middle Fork North Fork Teton River	From the mouth to the headwaters.	6.8	Scenic	Fish	
Waldron Creek	From the mouth to the headwaters.	4.3	Recreational	Fish	
North Fork Sun River	From Bob Marshall Wilderness boundary to the headwaters.	26.1	Wild	Scenery Recreation	
South Fork Sun River	From Bob Marshall Wilderness boundary to the headwaters.	26.2	Wild	Recreation Wildlife	
West Fork South Fork Sun River	From mouth to the confluence with Ahorn Creek.	8.4	Wild	Recreation Wildlife	
Green Fork Straight Creek	From the mouth to the headwaters.	5.9	Wild	Scenery Geology	Eligible in 1989 for Scenery and Geology.
Wood Creek	From the dam on Wood Lake northwest to the confluence with Straight Creek.	7.1	Recreational	Wildlife	

River name	Segment description	Miles	Classification	Outstanding remarkable values	Past eligibility notes
Dearborn River	From FS boundary to the confluence with Whitetail Creek.	6.5	Wild	Scenery	Eligible in 1989 for Scenery.
Snowies GA					
Swimming Woman Creek	From private land boundary to the headwaters.	3.9	Scenic	Scenery Geology	
East Fork Big Spring Creek	From confluence with a no name stream in T13N R19E Section 33 to the headwaters.	5.3	Wild	Fish	
Upper Blackfoot GA					
Alice Creek	From private land boundary to the headwaters.	6.5	Recreational	Cultural	
Copper Creek	Segment 1: From FS boundary to FS boundary.	1.1	Recreational	Fish	Eligible in 1989 for Fish.
	Segment 2: From FS boundary to the headwaters.	12.0	Recreational		
Landers Fork	Segment 1: From FS boundary to confluence with Byrnes Creek.	0.3	Scenic	Fish	
	Segment 2: From the confluence with Byrnes Creek to the headwaters.	18.5	Wild		
Snowbank Creek	From the mouth to the headwaters.	4.4	Scenic	Fish	
Total miles of eligible sections of wild and scenic rivers					360.7 miles

### 3.21.10 Eligible wild and scenic rivers, environmental consequences

#### Effects common to all alternatives

Rivers determined to be eligible within the national system must have certain interim protection measures. These protection measures apply until a decision is made of the future use of the river and the adjacent lands through an act of Congress or a determination that the river is not suitable. Along with the interim protective measures additional statutory, regulatory, or policy requirements may apply if the study river is located within a wilderness area or other designated area. In case of conflict between the provisions of the Wilderness Act and FSH 1909.12 Chapter 80 the more restrictive provisions shall apply.

Under all alternatives, the identified eligible WSRs (and area within ¼ mile on either side of each river) would be managed to protect their free-flowing condition, to preserve and enhance the outstandingly remarkable value(s) for which they were identified, and to retain the preliminary classification given to each river segment.

#### Effects common to all action alternatives

The plan components developed for eligible WSRs are based on interim protection measures outlined in FSH 1909.12, Chapter 80 and remain the same in all action alternatives. Table 192 summarizes each plan component related to eligible WSRs.



**Table 192. Summary of plan components for eligible WSRs**

<b>Plan component</b>	<b>Summary of plan components for eligible WSRs</b>
FW-WSR-DC-01	This DC establishes that all eligible WSRs/river segments would retain their free-flowing condition and the outstandingly remarkable value for which they were identified.
FW-WSR-DC-02	This DC ensures that the classification of each river remain intact unless it is changed through a completed suitability study.
FW-WSR-GDL-01	This guideline provides interim protection measure for the eligible WSRs and lands ¼ mile on either side of these rivers.

*Effects from forest plan components associated with:***Aquatic ecosystems and soil management**

Plan components and activities related to watershed, soil, riparian, or aquatic habitat improvements would have a minor effect to eligible WSRs due to the protections already in place for these areas with interim protection measures (FW-WSR-GDL-01).

East of the Continental Divide (the majority of the HLC NF), RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. West of the Continental Divide, the area influenced by riparian plan components is the same across all alternatives because RMZs would be defined the same way as riparian habitat conservation zones are in the no-action alternative. The guideline for eligible WSR management defines a ¼ mile area on either side of the stream where interim protection measures apply; this area would encompass RMZs. Plan components for the management of RMZs are consistent with the interim protection measures.

**Fire and fuels management**

Natural, unplanned ignitions and prescribed fires are used as tools to maintain ecological conditions within river corridors. These fire and fuels management tools may remain so long as they maintain the outstandingly remarkable values and free-flowing nature of the identified rivers. Plan components for fire and fuels management would encourage an appropriate management response to wildfires and provide opportunities for natural fire to promote and/or enhance the characteristics of these areas.

**Timber and vegetation management**

Eligible wild classified rivers are not suitable for timber production and timber harvest is highly constrained in the river corridor. Therefore, there would be no effects from timber harvest on those segments. On eligible recreational or scenic classified rivers, timber production is not suitable but timber harvest is allowed for multiple-use purposes, for salvage logging, and to achieve desired vegetation conditions, so long as the outstandingly remarkable values of the river or river segment are not affected. Plan components related to desired vegetation would help define the objectives for any harvest treatments that could occur in these areas.

**Livestock grazing and management**

Livestock grazing is common on the HLC NF and may potentially affect the outstandingly remarkable values along eligible WSRs. Grazing, along with existing and new facilities necessary for grazing allotments, may remain so long as the outstandingly remarkable values and free-flowing nature of the identified rivers is maintained.

Livestock grazing has the potential to impact plant communities through factors such as invasive plant spread and damage to riparian areas, plan components emphasize the maintenance of resilient native plant communities as well as desirable riparian area conditions. These components should help protect eligible WSRs, to a greater degree with the action alternatives as compared to the no-action alternative.

**Recreation and scenery management**

Eligible WSR corridors may be used for dispersed camping and other dispersed recreation activities such as, but not limited to, canoeing, fishing, biking, horseback riding, photography, bird watching, hiking, and hunting. In order to provide an essentially primitive character, eligible segments classified as wild generally would not have developed recreation sites. In segments classified as scenic or recreational, recreation development would be allowed when such sites would protect and maintain the outstandingly remarkable values for which the river was deemed eligible. Trail maintenance work can be expected to have little if any impact in the river corridors.

**Cultural, historic, and tribal resource management**

Plan components for cultural, historic, and tribal resources would complement the management of eligible WSRs.

**Road access and infrastructure**

Plan components for road access and infrastructure would help ensure that roads that may occur within eligible WSR corridors are maintained in a condition that protects the hydrological resources of those areas.

**Minerals management**

Eligible rivers with scenic or recreation classification areas are not withdrawn for mineral entry and are suitable for mineral exploration and development while protecting and maintaining the outstandingly remarkable values for which the river was identified. Eligible segments classified as wild would not be available for mineral development upon designation.

**Alternative A, no action**

Under alternative A, the eligible WSRs would be managed under direction provided in the 1986 Helena and Lewis and Clark Forest Plans. Table 193 describes the plan components in the 1986 Helena and Lewis and Clark Forest Plans that provide direction for eligible WSRs.

**Table 193. Summary of existing 1986 plan components for eligible WSRs**

Plan component	Summary of 1986 plan componts for eligible WSRs
1986 Helena NF Plan Goal 19, Page II/2	This goal provides direction to protect stream segments found eligible for classification under the Wild and Scenic Rivers Act until suitability studies are complete.
1986 Helena NF Plan Objective, Resource Activity/ Summaries Wild and Scenic Rivers, Page II/6	This objective lists the eligible stream segments identified in the 1989 eligibility study and provides direction to protect and/or maintain the outstandingly remarkable resource values and potential classification until suitability studies can be completed.
1986 Helena NF Plan Forest-wide Standards, Wild and Scenic Rivers, Page II/36	These forestwide standards provide direction for the following located in or adjacent to eligible WSRs: hydroelectric power, water supply, flood control, range, timber production, mining, road construction, motorized travel, utilities, recreation development, structures, and fisheries.
1986 Helena NF Plan; Implementation/Monitoring, Page IV/6	This forestwide monitoring requirement requires the monitoring of any action that would adversely impact eligible river qualifications or potential classifications.
1986 Lewis and Clark NF Plan Goal 11, Page 2-3	This goal protects the existing condition of the eligible WSRs and maintains or enhances the outstandingly remarkable resource value(s) for each river while providing for public recreation and resource uses which do not adversely impact or degrade those values.
1986 Lewis and Clark NF Plan Objectives, Wild and Scenic Rivers, Page 2-9	This objective identifies the rivers that were found to be eligible in the 1989 eligibility study and provides interim direction to protect and/or maintain the outstandingly remarkable resource values and potential classification until suitability studies can be completed.

Plan component	Summary of 1986 plan componts for eligible WSRs
1986 Lewis and Clark NF Plan Forest-wide Management Standards W-1, W-2, and W-3 Pages 2-75 through 2-81	These standards provide management direction for the following activities located in or adjacent to eligible WSRs: hydroelectric power, water supply, flood control, range, timber production, mining, road construction, motorized travel, utilities, recreation development, structures, and fisheries.

**Alternatives B- F**

See effects common to all action alternatives.

**Conclusions**

Under all alternatives, the identified eligible river segments would be managed to protect their free-flowing condition and to preserve and enhance the outstandingly remarkable value(s) for which they were identified. Alternative A would manage the eligible rivers as per the direction from the 1986 Helena and Lewis and Clark Forest Plans. These plans provide interim direction for the eligible streams and emphasize the need for suitability studies for these rivers.

Similar to alternative A, the plan components of alternatives B-F provide interim management direction, protect the free-flowing character, protect the identified outstandingly remarkable values, and protect the preliminary classification for eligible river segments. All of the action alternatives would meet the purpose and need because they are consistent with the 2012 Planning Rule and associated directives, which provides direction to complete an eligible WSR study on all free-flowing streams when conducting a forest plan revision.

**3.21.11 National recreation trails, affected environment**

National scenic trails (such as the Continental Divide National Scenic Trail) and national historic trails may only be designated by Congress. National recreation trails may be designated by the Secretary of Interior or the Secretary of Agriculture to recognize exemplary trails of local and regional significance in response to an application from the trails managing agency or organization. Through designation, these trails are recognized as part of America’s National Trail System.

The national recreation trails on the HLC NF are generally single track, linear features that pass through a great variety of physical features ranging from natural-appearing settings to locations where developments are noticeable. There are 9 national recreation trails on the HLC NF totaling 40 miles. Most of these trails are located in the Little Belt Mountains GA. Approximately 65% of the national recreation trails on the forest are open to motorized trail uses. See Table 194.

**Table 194. National recreation trails**

GA	Trail name	Trail number	Miles
Big Belts	Hanging Valley	247	6
Divide	Mt. Helena	373	6
Little Belt Mountains	North Fork Deep Creek	303	6
Little Belt Mountains	Ming Coulee	307	3
Little Belt Mountains	South Fork Deep Creek	316	5
Little Belt Mountains	Blankenbaker	320	4
Little Belt Mountains	Deep Creek Ridge	338	6
Little Belt Mountains	Monument Ridge	339	2
Snowies	Crystal Lake	404	2
Total			40

### 3.21.12 National recreation trails, environmental consequences

#### Effects common to all alternatives

Under all alternatives, the national recreation trails would meet the purpose of the National Trails System Act which is "to promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas and historic resources of the Nation."

#### Effects common to all action alternatives

Plan components developed for national recreation trails would remain the same in all action alternatives and provide general guidance for these specifically identified trails. See Table 195.

**Table 195. Summary of plan components for national recreation trails**

Plan component	Summary of the plan components for national recreation trails
FW-NRT-DC-01	This desired condition ensures that management of the national recreation trails would protect and/or enhance the nature and purposes for which they have been established.
FW-NRT-DC-02 FW-NRT-DC-03	These plan components ensure that trails outside of wilderness would be clearly marked and would provide interpretation and education in such a manner as to not impair the identified trail features and/or values.
FW-NRT-GDL-01	This guideline would maintain and enhance the valued attributes for which the trail(s) have been established.

#### Effects from forest plan components associated with:

##### **Aquatic ecosystems and soil management**

Plan components and activities related to aquatic ecosystems and soil management would generally have little effect to national recreation trails. Where the trails cross or parallel streams, plan components related to RMZs would help maintain the scenic quality of those areas, and therefore complement the management of the trail. Trail maintenance activities may be influenced by plan components related to the maintenance of vegetation conditions in riparian areas, downed wood requirements within streams, and the condition of stream crossings.

East of the Continental Divide (the majority of the HLC NF), RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. West of the Continental Divide, the area influenced by riparian plan components is the same across all alternatives because RMZs would be defined the same way as riparian habitat conservation zones are in the no-action alternative. Please refer to the RMZ section.

##### **Fire and fuels management**

Plan components for fire and fuels management would encourage an appropriate management response to wildfires that may occur near national recreation trails and provide opportunities for natural fire to alter the vegetation condition of the landscape. When fire does occur, whether natural or management-ignited, it could change the scenery visible from the trails, including charred vegetation in the short term as well as regrowth in the longer term.

##### **Timber and vegetation management**

Some stretches of the trails may be in areas where timber harvest could occur. Where harvest does occur, it could impact the scenic values visible from the trail, including more open vegetation and stumps, as well as soil disturbance in the short term. Conversely, harvest could be used to improve the scenic quality by creating vistas, mimic vegetation structures that would be created by natural disturbance and promote healthy vegetation. Vegetation plan components would help define the objectives for treatments that may occur near the trail. In addition to harvest, plan components would allow for other vegetation treatments such as tree planting and weed spraying near the trails.

### **Livestock grazing and management**

Livestock grazing allotments could occur along or in proximity to the trails. Evidence of grazing, including cows, cow patties, grazed vegetation, and grazing permit administration could be observed. However, plan components for livestock grazing emphasize the maintenance of resilient native plant communities as well as desirable riparian area conditions. These components should help protect the scenic quality of the trails, to a greater degree with the action alternatives as compared to the no-action alternative.

### **Recreation and scenery management**

Recreation and scenery management plan components would complement the management of the trails by specifying ROS settings and scenic quality objectives that are consistent with the desired conditions of the trail, along with providing the facilities and infrastructure needed for the public to access and use the trail system.

### **Cultural, historic, and tribal resource management**

Plan components for cultural, historic, and tribal resources would complement the management of the national recreation trails.

### **Road access and infrastructure**

To the extent that trails or routes in proximity to the trails may be maintained, reconstructed, or relocated, the plan components for access and infrastructure would ensure that this work is done in a manner that meets the need of trail users and has minimal impacts to other resources. These components would complement the management of the trail system.

### **Minerals management**

Lands along national recreation trails would be available for minerals activities.

### **Alternative A, no action**

National recreation trails do not receive special recognition in the 1986 Helena Forest Plan. However, the 1986 Lewis and Clark Forest Plan does recognize these trails and created a forestwide standard to address them. In the no-action alternative, national recreation trails covered by the Helena 1986 Forest Plan would be managed by direction provided for all forest trails on the Helena NF. The national recreation trails covered by the Lewis and Clark Forest 1986 Forest Plan would be managed as national recreation trails as per forestwide standard L-4/32.

The following plan components provide overall direction for trail and specific direction for national recreation trails in the 1986 Helena and Lewis and Clark Forest Plans. The expected effects from specific plan components are summarized in Table 196.

**Table 196. Summary of existing plan components for all trails, including national recreation trails**

<b>Plan component</b>	<b>Summary of the 1986 plan components for national recreation trails</b>
Helena NF Goals 1 and 2	These plan components provide for a range of outdoor recreation opportunities that can be developed for visitor use and satisfaction, including motorized and nonmotorized opportunities.
Helena NF Objectives	The Helena NF objectives provide for the construction of a cost-effective roads and trails system that meets the Forest land and resource objectives and forest visitor needs.
Helena NF Forest-wide Trail Standards 1, 2, 3, 4	These forestwide trails standards provide overall guidance for managing a forest trail system to meet established standards, and address trail maintenance, funding, use, construction and reconstruction.
Helena NF, Management Area R- 1	This management area provides direction for the construction of trailhead facilities to increase access and continue to enhance recreation opportunities.

Plan component	Summary of the 1986 plan components for national recreation trails
Lewis and Clark NF Objectives	The Lewis and Clark NF objectives for facilities include direction for roads, trails, and airfields. These facilities will be constructed, managed, and maintained to meet the land and resource objectives of the Forest in a cost-effective manner.
Lewis and Clark NF Forest-wide Standard L-4/32	This standard specifically states that all National Recreation Trails corridors would be protected and maintained.

## Alternatives B – F

See effects common to all alternatives.

## Conclusions

Under alternative A, the nine national recreation trails on the Forest would continue to be managed according to direction provided for all trails in the 1986 Helena Forest Plan and for the specific national recreation trails in the Lewis and Clark 1986 Forest Plan. There would be no additions to the national recreation trail inventory and travel plans would continue to provide the direction for where motorized uses can and cannot occur.

Plan components developed for national recreation trails are very similar to those presently providing direction in the 1986 Forest Plans. The plan components for national recreation trails would remain the same in alternatives B-F and would provide general guidance for these trails. By providing the plan components outlined in the action alternatives, the HLC NF would meet the purpose and need of the Plan, ensuring that the nature and purposes for which these national recreation trails were identified is enhanced and/or protected for present and future generations.

### *3.21.13 Research natural areas, affected environment*

#### Introduction

The Organic Administration Act of June 4, 1897 authorizes the Secretary of Agriculture to designate research natural areas (RNAs). Special designations, 36 CFR 219.23 and 36 CFR 219.25, advise that forest planning shall provide for the establishment of RNAs. Areas of important forest, scrubland, grassland, alpine, aquatic, and geologic types that have special or unique characteristics of scientific interest and importance will be identified and proposed as lands needed to complete the national RNA network.

RNAs are permanently established to maintain areas of natural ecosystems and areas of special ecological significance. These protective designations were made to maintain the natural ecosystem components and processes of these areas and are cooperatively identified, established, and managed with the USDA Forest Service Rocky Mountain Research Station. These designated areas form a long-term network of ecological reserves established as baseline areas for nonmanipulative research, education, and the maintenance of biodiversity.

#### Research natural area establishment process

RNA identification, establishment and management are outlined in FSM 4063. They are administratively designated by the Regional Forester with research station director concurrence. The following steps are followed to establish RNAs:

- Identification of RNA needs – The R1/research station RNA committee develops and periodically updates a list of RNA targets for Region 1, which is approved by the Regional Forester.
- Site nomination – A site may be nominated as a RNA if it fulfills one or more gaps in the RNA system; includes unique geologic, topographic, wildlife, or vegetation; and/or contains habitat for at-risk plant species.

- Site candidacy – A site becomes a candidate RNA once the site nomination is reviewed by the R1/research station RNA committee and Forest and District personnel, including a field visit, and the committee decides to pursue RNA designation.
- Site proposal and forest planning/NEPA – Once the RNA committee recommends pursuing the RNA, and the line officers on the Forest agree, proposed RNAs are presented for analysis, often in the forest planning process. The Plan includes identification and recommendation of proposed RNAs.
- Ecological evaluation - Once the RNA is proposed, an ecological evaluation is conducted to provide initial baseline information on physical, biological, and other resource values for the proposed RNA.
- Establishment record preparation – Information found in the ecological evaluation is reformatted into an establishment record, which is reviewed by the R1/research station RNA committee and Forest personnel. These records serve as the documentation of the proposed action in the NEPA process.
- NEPA process - Following forest planning and preparation of an establishment record, a new NEPA process is conducted, with the Regional Forester as the deciding officer.
- Establishment – The RNA is formally established once the Decision Notice/Designation Order has been signed by the Regional Forester, and final signatures have been obtained on establishment records.
- Document filing – Copies of the establishment record, environmental assessment, and decision notice/designation order are distributed to the Washington Office, Regional Forester, Station Director, Forest Supervisor, District Ranger, RNA coordinator, and with the Natural Areas Program in Missoula.

**Research natural areas on the HLC NF**

The HLC NF has 12 designated RNAs under all alternatives, one proposed under all alternatives (Granite Butte), and one proposed (Poe-Manley) under alternatives D and F.

- Designated RNAs have been formally established by a decision signed by the Regional Forester, with concurrence of the Research Station Director, after being vetted through the Forest and Rocky Mountain Research Station via forest planning, during revision or by amendment. All the process steps outlined in the previous section have been completed for these areas.
- Proposed RNAs have been vetted through the Forest and Rocky Mountain Research station via forest planning, but they have not yet been established by a Regional Forester decision. Following the completion of forest planning, these areas may continue through the establishment process, starting with an ecological evaluation and establishment record preparation.

Table 197 describes the RNAs.

**Table 197. Designated and proposed RNAs**

<b>RNA</b>	<b>GA</b>	<b>Purpose for establishment</b>	<b>Status</b>	<b>Acres</b>
Cabin Gulch	Big Belts	Douglas-fir with bunchgrass understory.	Designated	2,418
Bartleson Peak	Little Belts	Spruce/cleft leaf groundsel and cinquefoil/Idaho fescue habitat types	Designated	1,603
O'Brien Creek	Little Belts	A variety of riparian vegetation types, an un-entrenched, moderate to gentle gradient stream.	Designated	697
Onion Park	Little Belts	Tufted hairgrass-sedge, subalpine fir/grouse whortleberry and subalpine fir/bluejoint reedgrass; mesic meadow	Designated	1,207
Paine Gulch	Little Belts	Long-lived seral Douglas-fir on subalpine fir series sites, seral ponderosa pine and limber pine communities on Douglas-fir series sites.	Designated	2,402

RNA	GA	Purpose for establishment	Status	Acres
Wagner Basin	Rocky Mountain Range	Unique wetland complexes containing large populations of Giant helleborine and yellow lady's-slipper.	Designated	940
Walling Reef	Rocky Mountain Range	High-elevation forest, shrubland, grassland, wetland, and alpine ecosystems.	Designated	833
Greathouse Peak	Snowies	Alpine tundra plant communities on an alpine plateau composed of calcareous (limestone) substrate	Designated	1,280
Big Snowy – Old Baldy	Snowies	Alpine tundra plant communities on an alpine plateau composed of calcareous (limestone) substrate	Designated	1,866
Minerva Creek	Snowies	Ponderosa pine/snowberry interspersed with meadows	Designated	340
Indian Meadows	Upper Blackfoot	Douglas fir/blue huckleberry, Douglas fir/pine grass, Douglas fir/elk sedge, Subalpine fir/beargrass, Subalpine fir/bluejoint, Subalpine fir/menziesia and wet meadows.	Designated	992
Red Mountain	Upper Blackfoot	Subalpine fir and whitebark pine habitat types, high alpine non forest habitat types, scree and type I and II streams	Designated	1,897
Granite Butte	Upper Blackfoot	Subalpine fir and white bark pine habitat types, montane grassland dominated by rough fescue.	Proposed (all alternatives)	394
Poe-Manley	Elkhorns	Montane grassland dominated by rough fescue	Proposed, (alternative D)	4,505
			Proposed (alternative F)	1,578

### Granite Butte Proposed RNA

The Granite Butte proposed RNA, located in the Upper Blackfoot GA, is identified as a potential RNA representing a montane grassland dominated by rough fescue (*Festuca campestris*), as well as a unique whitebark pine type. This site was proposed as an RNA in the 1986 Helena NF Plan. In addition to an extensive grassland area, the site contains a unique whitebark pine/subalpine fir/spruce ribbon forest/snow glade community: A sedge-rush (*Carex-Juncus*) plant community is separated from the main grassland by a narrow ribbon forest. Strong prevailing western winds blow the heavy snows off the grassland and deposit the snow on the lee side of the ribbon forest. The grassland is in excellent condition and includes key indicators of high productivity including sticky purple geranium (*Geranium viscosissimum*) and prairie smoke (*Geum triflorum*) amongst the rough fescue. Missoula phlox (*Phlox kelseyi* var. *missoulensis*) is also present. The ribbon forest along the ridge consists primarily of whitebark pine (*Pinus albicaulis*) and subalpine fir (*Abies lasiocarpa*), with much of the whitebark pine dying or already dead. In the open areas on the edge of the melting snowbank, early spring ephemerals, including spring beauty (*Claytonia lanceolata*) and glacier lily (*Erythronium grandiflorum*), are found. The predominant vegetation in these snow glades consists of several sedge (*Carex*) and rush (*Juncus*) species. The presence of a low-standard, 2-track road in the area where motorized use was allowed has been the limiting factor on formally establishing this area as an RNA. However, the Blackfoot Travel Plan has designated this trail as nonmotorized, and the existing 2-track road has been converted to a 1-track trail.

### Poe-Manley Proposed RNA

The Poe-Manley site has been identified as a proposed montane grassland RNA dominated by rough fescue (*Festuca campestris*) under alternatives D and F. This area is in the Elkhorns GA, in close proximity to the



Tizer basin loop. The grasslands are in excellent condition, with a mix of various grasses and forbs. Rough fescue is the dominant grass species. In Poe Park, there is a population of Missoula phlox (*Phlox kelseyi* var. *missoulensis*). Only one small area of noxious weeds is present – Canada thistle (*Cirsium arvense*) -- in Manley Park. No domestic livestock grazing is allowed in the area. The forests around these two grassland parks had substantial mortality, especially in lodgepole pine (*Pinus contorta*) and whitebark pine (*Pinus albicaulis*). Some evidence of previous mining activity exists at the west end of Manley Park, including several small pits and one adit. There is no evidence of roads in the area. The hiking trail through the grasslands and the wooded area between the two parks receives light to moderate use. Based on the analysis and public comments on the DEIS, in which Poe Manley was included as a candidate RNA in alternative D, this area is included as a proposed RNA in alternatives D and F in the FEIS. The size of the RNA varies by alternative, as discussed in the environmental consequences section.

### 3.21.14 Research natural areas, environmental consequences

#### Effects common to all alternatives

Under all alternatives, the 12 existing RNAs would maintain their designations. In these areas, direction in the establishment records and FSM 4063 would be followed to conserve the plant associations for which they were established. They would be conserved on the landscape to contribute to biodiversity and allow opportunities for research, monitoring, and education.

In some cases, management is needed to maintain or restore the target plant communities in RNAs. Under all alternatives, FSM 4063 would be followed in this regard. Specifically related to vegetation management, the manual states that only tried and reliable vegetation management techniques would be used, where the vegetation type would be lost or degraded without management. Management practices must provide a closer approximation of the naturally occurring vegetation and natural processes governing the vegetation than would be possible without management. Any management activities would need to be authorized by the research station Director, and may include grazing, thinning, control of excessive animal populations, prescribed burning, and post-fire Burned Area Emergency Response work (FSM 4063.34). Further, management activities would need to be consistent with forest plan direction, which varies by alternative as described in subsequent sections. Establishment records may also include specific vegetation management considerations for each RNA.

Under all alternatives, the Granite Butte area, which has been extensively reviewed and vetted, could become an established RNA based on a separate decision by the Regional Forester, following completion of the establishment record and Research Station Director’s concurrence.

The potential for additional RNAs in the future would exist under any alternative, which could occur as forest plan amendments. Original RNA area target assignments for plant associations on the NFs in Region 1 were given in the 1983 Regional Planning Guide. The Northern Region Status and Needs Assessment for RNAs (Chadde, Kimball, & Evenden, 1996) updated the planning guide and recommended additional unrepresented plant associations on each NF in Region 1 so that the entire range of associations in the Northern Region could be represented in the RNA network.

#### Effects common to all action alternatives

All action alternatives include the following plan components (Table 198).

**Table 198. Summary of plan components for RNAs**

Plan component	Summary of the plan components for the RNAs
FW-RNA-DC-01	This DC would ensure that the natural processes within RNAs function with little human influence.

<b>Plan component</b>	<b>Summary of the plan components for the RNAs</b>
FW-RNA-GDL-01	This GDL would ensure that RNAs are managed and monitored according to their site establishment records and FS manual 4063.
FW-RNA-SUIT-01	The RNAs are not suitable for timber production, although vegetation treatments could occur if consistent with establishment records or management plans.
FW-RNA-SUIT-02	Winter (over snow) motorized travel is suitable in RNAs so long as these uses do not interfere with the objectives and purposes of the RNA.
FW-RNA-SUIT-03	Summer motorized routes and new motorized routes are not suitable in research natural areas.
FW-RNA-SUIT-04	This component allows livestock grazing to occur if consistent with establishment records or management plans.

Although the plan components would apply, the proposed RNAs (Granite Butte and Poe-Manley, depending on alternative) would not have establishment records until the completion of the ecological evaluations and subsequent NEPA process.

*Effects from forest plan components associated with:*

**Aquatic ecosystems and soil management**

Activities related to watershed, soil, riparian, or aquatic habitat would generally not occur in RNAs, and there would be little to no effect related to the management of these resources. Plan components that broadly provide for aquatic ecosystem health would be complementary to RNA desired conditions.

**Fire and fuels management**

Plan components for prescribed fire and wildfire could affect RNAs. Fire is a primary natural ecosystem process, and all action alternatives emphasize the importance of allowing such processes to occur. Prescribed fire and fire suppression tactics would adhere to site establishment records and FS manual 4063, which ensure that natural fires are allowed to burn only within a prescription designed to accomplish objectives specific to the RNA. Further, fires that occur on the broader landscape could influence the type and severity of wildfire that enters RNAs.

Plan components for fire and fuels management would encourage an appropriate management response to wildfires that may occur in RNAs and provide opportunities for natural fire to alter the vegetation condition of the landscape. Fire on the landscape would generally complement the desire for natural ecological processes within these areas. Plan components are in place to ensure that minimum impact suppression tactics or other tactics appropriate for the protection of the trail values are used.

**Timber and vegetation management**

Under all action alternatives, RNAs are not suitable for timber production. The 1986 Forest Plans (alternative A) explicitly prohibit timber harvest for any purpose, and therefore timber management and associated plan components would have no effect. The Plan, under all action alternatives, allows that some vegetation treatments could occur where consistent with site establishment records and plans, as well as FSM 4063. FSM 4063.34 does provide that thinning could be done, with station director approval, if necessary, to avoid the loss or degradation of the vegetation type. Any activities that may occur would likely have minimal impact to vegetation conditions or be designed to maintain or restore desired conditions.

In addition, timber harvest and other vegetation management activities that occur on the broader landscape could influence the type and severity of wildfire that enters RNAs.

**Livestock grazing and management**

The 1986 Forest Plans (alternative A) explicitly prohibit livestock grazing in RNAs, and therefore grazing management and associated plan components would have no effect. The Plan, under the action alternatives, allows for some grazing to occur where consistent with site establishment records and plans, as provided by

FSM 4063.34. However, generally the limitations in FSM 4063.34 and site records would preclude this activity, because grazing could only occur where needed to control invasive plants or to preserve the vegetation for which the RNA was created. Therefore, grazing and associated plan components would likely have minimal and/or positive impacts to RNAs.

### **Wildlife habitat management**

Activities related to wildlife habitat management would generally not occur within RNAs, and therefore there would be little to no effect. Plan components that provide broadly for wildlife habitat would be complementary to RNA desired conditions.

### **Recreation and scenery management**

Under all action alternatives, the ROS setting for established and proposed RNAs is generally primitive, and the scenic integrity objective is generally high or very high. Managing for primitive recreation opportunities would not result in substantial impacts to the natural vegetation and natural processes in these areas. Alternative A does not include the concepts of recreation opportunity spectrum nor scenic integrity objectives, but the visual quality objectives prescribed for RNAs (retention or preservation) would result in similar effects.

Alternatives D and F include the Poe-Manley proposed RNA. The ROS setting in this area includes primitive in the central core area during both summer and winter, some areas of roaded natural in the summer; and semiprimitive motorized and semiprimitive nonmotorized in the winter. The summer roaded natural areas and winter semiprimitive nonmotorized areas accommodate the existence of the nearby motorized Tizer Lakes loop route to the west and other routes near the eastern boundary. These routes are nearby but do not enter the RNA. The winter semiprimitive motorized area accommodates snowmobile use on the western portion of the RNA. These uses are compatible with the RNA management guidance but may do less to protect the desired characteristic of the area than the primitive ROS setting that is applied to the other RNAs found in all alternatives.

### **Cultural, historic, and tribal resource management**

Activities related to cultural, historic, and tribal resources would generally not occur within RNAs, and therefore there would be little to no effects related to the management of these resources. Generally, the plan components designed to preserve and protect these resources would complement the plan components designed to preserve and protect the vegetation communities within RNAs.

### **Road access and infrastructure**

All action alternatives are similar in terms of plan components for road access and infrastructure. New road and trail construction, or other infrastructure and facilities, would not generally occur in RNAs under any alternative, because FS manual 4063 prohibits new roads, trails, fences, or signs on an established RNA unless they contribute to the objectives or protection of the area.

### **Minerals management**

RNAs are available for minerals activities. However, per FS manual 4063 proposals to offer Federal mineral, oil, and gas leases would be evaluated by the Regional Forester, with concurrence of the Station Director, using standards set forth in FS manual 2820. The proposal with recommendation is forwarded by the Regional Forester to the Chief for the final decision.

### **Alternative A, no action**

The 1986 Forest Plans included components for RNAs, and these would apply to the no-action alternative. The RNAs included in this alternative are the 12 existing areas and 1 proposed (Granite Butte), some of which were established after the 1986 plans were developed.

In 1986, on the Helena NF, there were no designated RNAs, and three proposed (Red Mountain, Kingsberry Gulch, and Granite Butte) areas. The 1986 Forest Plan included objectives to evaluate additional areas to meet

regional targets for representation of habitat types. Kingsberry Gulch was dropped in 1997, via Forest Plan Amendment #16, and was substituted with the Cabin Gulch Research Natural Area, which has similar vegetation, aspect and slope. Red Mountain was ultimately established, along with an additional area, Indian Meadows. Granite Butte has not to date been formally established. RNAs were identified as management area N-1, for which the management goal was to provide areas for research, observation, and study of undisturbed ecosystems which typify important forest, shrubland, grassland, alpine, aquatic, and geologic types on the Helena NF.

Similarly on the Lewis and Clark NF there were 8 established RNAs that were included in the 1986 Forest Plan, with the goal of establishing additional areas to fulfill the assigned habitat type targets, and to leave these areas in their natural condition and use them for nonmanipulative research and observation. RNAs were identified as management area M.

The expected effects from specific plan components are summarized in Table 199. Both plans limit most management activities from occurring in these areas, with the exception of prescribed fire.

**Table 199. Summary of 1986 Plan components for RNAs**

Plan component	Summary of the 1986 Plan components for RNAs
Helena NF Management Area N-1	The standards for management area N-1 would ensure that within RNAs the following activities would not occur: improvements, developed or dispersed recreation facilities, wildlife habitat improvements, livestock grazing, timber harvest, mineral sales, utility corridors, road construction, or occupancy special use permits. Insects and disease levels would not be controlled. Prescribed burning could be used to perpetuate the natural diversity of plant communities. Fire suppression would be selected to minimize soil and vegetation disturbance. The visual quality objective would be retention.
Lewis and Clark NF Management Area M	The standards for management area M would allow dispersed recreation and motorized use in RNAs. The visual quality objective would preservation, which allows for ecological changes only. The standards preclude the following activities: wildlife habitat improvements, livestock grazing, and timber harvest, occupancy leases for minerals, special use permits, road construction, and trail construction. Prescribed fire could occur when commensurate with the goals for the RNA. Fire suppression response would depend on multiple factors. Changes to the vegetation could be caused by prescribed fire, natural processes, or minor impacts from dispersed recreation and motorized use.

**Alternatives B, C, and E**

Alternatives B, C, and E would be the same as A with respect to the number and location of designated and proposed RNAs. The effects would be as described under effects common to all action alternatives.

**Alternatives D and F**

Alternatives D and F would include Poe-Manley as a proposed RNA and differ only in the number of acres assigned to the RNA. Poe-Manley RNA would be 4,505 acres in alternative D and would be 1,578 acres in alternative F. Under these alternatives, the Poe Manley area could become an established RNA based on a separate decision by the Regional Forester, following completion of the establishment record and Research Station Director’s concurrence, and the acres that comprise the Poe-Manley area would contribute to fulfilling the ecosystem representation assigned to the HLC NF. Vegetation management would be limited to actions that maintain or restore natural processes. This designation would preclude development of future motorized recreation opportunities other than over-snow use in the area.

**Cumulative effects**

Under all alternatives, the network of RNAs would contribute to the understanding of key ecosystems and plant communities by being part of the broader array of sites that are designated across other NFs in the region. This network would continue to contribute to the conservation of biological diversity and provide for research

and educational opportunities in the planning area. Similar designations are not known to occur on lands of private ownership, nor on state lands in the area, increasing the importance of maintaining them on NFS lands. There are no cumulative effects associated with land management plans for other agencies in the planning area.

## Conclusions

All alternatives provide for a network of RNAs across the HLC NF, by including the existing designations of 12 RNAs (16,475 acres) and one proposed RNA (Granite Butte, 394 acres). Alternative D would include the addition of one proposed RNA, Poe-Manley (4,505 acres).

Alternative F would include the proposed RNA Poe-Manley but at 1,578 acres. The 1986 Forest Plans more explicitly prohibit management activities within RNAs than does the 2021 Land Management Plan, which allows for more uses when those uses are consistent with the site establishment record and standards in FSM 4063.

### *3.21.15 Tenderfoot Creek Experimental Forest, affected environment*

The Tenderfoot Creek Experimental Forest is managed by the Rocky Mountain Research Station and encompasses 9,125 acres of the headwaters of Tenderfoot Creek in the Little Belt Mountains. Research emphasis within the experimental forest was expanded in 1991 to develop and evaluate ecosystem-based treatments for sustaining productivity and biodiversity of lodgepole pine forests and watersheds. A map of the Tenderfoot Creek Experimental Forest can be found in appendix A.

### *3.21.16 Tenderfoot Creek Experimental Forest, environmental consequences*

#### Effects common to all alternatives

The administrative designation of the Tenderfoot Creek Experimental Forest would remain in place under all alternatives, and potential future research activities based on mutual agreement with the Rocky Mountain Research Station would be conducted in a similar manner.

#### Effects common to all action alternatives

All action alternatives would contain the same plan components related to the Tenderfoot Creek Experimental Forest. These components and their expected effects are summarized in Table 200.

**Table 200. Summary of plan components for Tenderfoot Creek Experimental Forest**

<b>Plan component</b>	<b>Summary of the plan components for the Tenderfoot Creek Experimental Forest</b>
LB-TCEF-DC-01; 02; 03; 04	The DCs would ensure that desired research and demonstration activities, as agreed upon with the Rocky Mountain Research Station, are supported by the vegetation conditions, facilities, infrastructure, and recreation management in this designated area.
LB-TCEF-SUIT-01	This component allows that while timber harvest may be conducted if it is part of research or demonstration, the area is not suitable for timber production and would not necessarily be managed in a way that emphasizes the production of timber. Timber harvest activities would affect the vegetation of this area when it is programmed as a research activity.
LB-TCEF-SUIT-02; 03	These components ensure that no nontimber forest products could be used commercially. Personal use of firewood, Christmas trees, boughs, and surface rock would not occur. This would ensure that such activities would not interfere with research. Other products such as mushrooms and botanical products could be used for personal use.
LB-TCEF-SUIT-04	No livestock grazing would occur, and therefore there would be no potential conflict of research activities with this use.
LB-TCEF-SUIT-05	This component allows for motorized travel on designated routes or trails and would ensure that public access is maintained in the area, as determined in travel plans.

Plan component	Summary of the plan components for the Tenderfoot Creek Experimental Forest
Forestwide and GA plan components	The suite of forestwide and GA plan components include but not limited to components related to wildlife, SIOs, aquatic ecosystems, soils, vegetation, recreation, minerals, roads, and land uses. These components would ensure that these resource values are maintained within the area.

Effects from forest plan components associated with:

### **Watershed, aquatic ecosystems, riparian, and soil management**

Plan components related to watershed, aquatic, riparian and soil resources may limit some research activities specifically with respect to harvest activities (type, location, intensity and/or prescriptions applied). RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used.

### **Fire and fuels management**

Alternative A emphasizes the control of fire in this area, while the action alternatives would not prescribe a particular management response to wildfire. In the action alternatives, plan components for fire and fuels management would encourage an appropriate management response to wildfires and provide opportunities for natural fire to alter the vegetation condition of the landscape. If fire does occur, it could change the vegetation in the experimental forest and influence potential future research opportunities.

### **Timber and vegetation management**

Under all alternatives, the area is unsuitable for timber production, but timber harvest may be used when part of an approved research activity. Timber harvest therefore has the potential to affect vegetation and other resources in this area. Timber plan components would ensure this activity is conducted in a manner that protects other resources.

### **Livestock grazing and management**

Livestock grazing would not be permitted under any alternative, and therefore there would be no effects from livestock grazing management or plan components.

### **Wildlife habitat management**

Specific requirements for the management of threatened and endangered wildlife species, such as Canada lynx and grizzly bear, could limit or modify research activities. Considerations relative to the Canada lynx are the most likely to have effects related to timber harvest. Please refer to the discussion about lynx management in the timber specialist section.

### **Recreation and scenery management**

Under the no-action alternative (1986 Forest Plans), the recreation setting of this area is roaded natural, which would not likely influence activities that may occur within this area for research. With the no-action alternative, the visual quality objective is partial retention or modification, or retention in areas seen from high sensitivity areas. Areas with a partial retention or retention visual quality objective may have some limitations to the harvest that could be conducted for research.

With the action alternatives, in both summer and winter ROS setting of the area is mostly semiprimitive nonmotorized with some roaded natural and primitive. The plan components associated with these settings would limit the type and extent of harvest that could occur in the semiprimitive (harvest would be constrained) and primitive (no harvest could occur). The scenic quality objectives under the action alternatives is high for most of this area, which would also limit harvest opportunities to meet research objectives. The influence of recreation opportunity settings and scenic quality objectives would likely be somewhat more limiting to harvest for research purposes than the no-action alternative.

### Cultural, historic, and tribal resource management

Plan components for cultural, historic, and tribal resources would have similar effects under all alternatives, in that protections for these resources would apply to proposed activities.

### Minerals management

Lands within the Tenderfoot Creek Experimental Forest would be available for minerals activities.

### Alternative A, no action

The existing 1986 Forest Plans for the Lewis and Clark NF includes guidance for the Tenderfoot Creek Experimental Forest, as summarized in Table 201. This area is described as management area K, with a goal of managing the experimental forest to meet research objectives.

**Table 201. Summary of 1986 Plan components for Tenderfoot Creek Experimental Forest**

Plan component	Summary of the 1986 Plan components for the Tenderfoot Creek Experimental Forest area
Recreation, 3-53	This section would ensure that recreation and visual quality are managed in a manner that supports research. The roaded natural setting and partial retention/modification visual quality objectives would allow for vegetation modification as needed to meet research purposes. Dispersed recreation would be managed with consideration for research values.
Wildlife, 3-54	This component provides for the maintenance of specific wildlife habitats, such as big-game winter ranges, calving or lambing areas, migration routes, elk summer ranges, and raptor nesting sites. This may somewhat limit research opportunities in specific areas.
Range, 3-54	This component ensures that no livestock grazing would occur, and therefore there would be no potential conflict of research activities with this use.
Timber, 3-54	This component allows for timber to be managed for research needs, and that timber removed is unregulated. Timber harvest activities may therefore affect the vegetation of this area when it is programmed as a research activity.
Soil and water, 3-54	This component allows that state water quality and soil productivity maintenance may be violated if needed for research. Adverse effects could occur to water quality and soils.
Minerals, 3-54	Surface occupancy would not be allowed, and requests for mineral exploration and development would be evaluated and administered through permits and leases.
Land use, 3-54	This component ensures that any new special-use permits would not conflict with the research goals of the area, and the area would not be impacted by utility corridors.
Roads, 3-54	These plan components would minimize public access and limit motorized access to existing roads. Roads could be constructed for research but would be closed to the public.
Mineral access, 3-55	This component specifies that mineral access roads would be constructed or reconstructed to minimum standards, and existing roads used when possible.
Trails, 3-55	Trails would be designed to be compatible with adjacent recreation settings. Trail management would ensure research values are protected.
Protection, 3-55	This component specifies that aggressive “control” fire suppression tactics are generally the appropriate response in this area.

### Alternatives B-F

See effects common to all action alternatives.

### Cumulative Effects

Under all alternatives, the designation and management of the Tenderfoot Creek Experimental Forest would contribute to ongoing research efforts to better understand treatment methods and the effects of management in lodgepole pine ecosystems, providing information relevant to the HLC NF, other NFs, and lands managed by other federal agencies, the state, and private entities. Experimental forest designations are not known to occur

on lands of private ownership, nor on state lands in the area, increasing the importance of this area. Therefore, there are no cumulative effects associated with land management plans for other agencies in the planning area.

**Conclusions**

Under all alternatives the administrative designation of this area, and the research activities that occur within it, would be similar. All alternatives would meet research objectives. The primary difference between the no-action alternative and the action alternatives is the ROS setting. The action alternatives may be more limiting to potential future research activities because of inclusion of primitive and semiprimitive recreation opportunity settings within the experimental forest. Alternative A would be permissive to potential vegetation management for research purposes with a recreation opportunity setting of roaded natural across the entire area.

**3.21.17 Missouri River Corridor, affected environment**

The Missouri River is a nationally recognized river famous for its fishing, outstanding scenery, and the history present along its shores. The Missouri River Corridor emphasis area lies immediately adjacent to and on both sides of the river and is 3,633 acres in size. It is located within the Divide GA.

The river is a primary access route through the Gates of the Mountains, a distinctive limestone cliff formation along this portion of the Missouri River. Recreation use of the Missouri River Corridor is year-round but particularly high during the summer months when water recreation is the most active. A commercial tour boat operation offers boat trips and there are several developed and dispersed recreation sites along the banks of the river. This Missouri River Corridor also provides access to the western portions of the Gates of the Mountain Wilderness. In addition, there are concentrations of cliff nesting raptors in this corridor.

**3.21.18 Missouri River Corridor, environmental consequences**

**Effects common to all alternatives**

Under all alternatives, the Missouri River Corridor would continue to provide motorized and nonmotorized water-based recreation opportunities.

**Effects common to all action alternatives**

The plan components developed for the Missouri River Corridor would remain the same in all action alternatives. These plan components focus on protecting and enhancing the natural, cultural, and historic values along the Missouri River as well as providing guidance for interpretation and signage. Table 202 summarizes the expected effects of each plan component related to the Missouri River Corridor.

**Table 202. Summary of plan components for Missouri River Corridor**

Plan component	Summary of plan components for Missouri River Corridor
BB-MISCOR-DC-01 BB-MISCOR-DC-05 BB-MISCOR-DC-06	These DCs establish recreation settings and opportunities that are compatible with ecological and cultural/historic features within the corridor.
BB-MISCOR-DC-02 BB-MISCOR-GDL-01	The Missouri River Corridor appears natural and would be managed at a High or Very High SIO.
BB-MISCOR-DC-03 BB-MISCOR-DC-04	The Missouri River Corridor maintains its historic and cultural features and interpretation is available and enhances visitor experiences of the area.
BB-MISCOR-GO-01	This plan component promotes working collaboratively with partners and volunteers to accomplish work within the Missouri River Corridor.



Plan component	Summary of plan components for Missouri River Corridor
BB-MISCOR-SUIT-01	The Missouri River Corridor is unsuitable for timber production, although vegetation treatments could occur for reasons of public safety and to enhance the recreation or aesthetic values of the area.

*Effects from forest plan components associated with:*

**Aquatic ecosystems and soil management**

Plan components and activities related to watershed, soil, riparian, or aquatic habitat improvements would influence the management of the Missouri River Corridor, primarily through the management of RMZs. East of the Continental Divide, RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. Plan components for the management of RMZs would help ensure that desirable conditions are maintained or promoted.

**Fire and fuels management**

Natural, unplanned ignitions and prescribed fires may be used to maintain ecological conditions in the corridor. Plan components for fire and fuels management would encourage an appropriate management response to wildfires and provide opportunities for natural fire to promote and/or enhance the characteristics of the area.

**Timber and vegetation management**

The Missouri River Corridor is not suitable for timber production, but harvest may be allowed to provide for public safety and enhance the recreational or aesthetic values. Where harvest does occur, it could impact the scenic values, including more open vegetation and stumps, as well as soil disturbance in the short term. Conversely, harvest could be used to improve the scenic quality by creating vistas, mimic vegetation structures that would be created by natural disturbance, promoting healthy vegetation, and mitigating hazard trees in public use areas. Vegetation plan components would help define the objectives for treatments. In addition to harvest, plan components would allow for other vegetation treatments such as tree planting and weed spraying, which could enhance the scenic quality of the corridor.

**Recreation and scenery management**

Recreation and scenery management plan components would complement the management of the Missouri River Corridor by specifying ROS settings and scenic quality objectives that are consistent with maintaining or moving toward the desired conditions of the corridor, along with providing the facilities and infrastructure needed for the public to access and use the area.

**Cultural, historic, and tribal resource management**

Plan components for cultural, historic, and tribal resources would complement the management of this area by helping to preserve the unique characteristics of the corridor.

**Road access and infrastructure**

Plan components for road access and infrastructure would help ensure that roads that may occur in proximity to the corridors are maintained in a condition that protects the resources of the area.

**Minerals management**

Lands within the Missouri River corridor would be available for minerals activities.

**Alternative A, no action**

Under alternative A, the Missouri River corridor would not be identified as an administratively designated area and would continue to be managed according to direction provided in the 1986 Helena NF plan. Recreation and interpretation along the corridor would continue to be managed through site specific and case-by-case management decisions on the Forest. Table 203 displays the plan components from the existing 1986 Helena NF Plan that would provide guidance for the Missouri River Corridor.

**Table 203. Summary of 1986 Helena NF plan components for the Missouri River Corridor**

Plan component	Summary of 1986 plan components for the Missouri River Corridor area
Helena NF Goals 1, 2, 9, 10, and 18	These goals provide for a range of outdoor recreation opportunities that could be developed for visitor use and satisfaction. Developed recreation sites, boat docks and landings, trails, and interpretive sites in the area would continue to be popular with locals as well as out of state visitors. Commercial boat trips and motorized boat access to the corridor for fishing, camping, and other recreation would continue to affect the recreation of the area. Additionally, the corridor would continue to provide access to the Gates of the Mountains wilderness.
Helena NF Objectives	The Missouri River corridor provides motorized boat access to a diverse ecosystem. The objectives that provide guidance include recreation, visual, cultural, water, fish and wildlife.
Helena NF Management Areas R-1 and R-2	The R-1 management area provides direction for large blocks of undeveloped lands suited for dispersed recreation. There are larger blocks of undeveloped lands along the Missouri River corridor that receive dispersed recreation activities. Off of the main corridor of the river, these lands would provide semiprimitive nonmotorized recreation settings. Management Area R-2 provides direction for developed recreation settings along the river. Developed recreation sites within the corridor are Meriwether Picnic area, the Meriwether and Coulter boating sites, and the Coulter Campground. These sites would continue to provide access to the Missouri River Corridor and undeveloped lands adjacent to the river.

## Alternatives B-F

See effects common to all action alternatives.

## Conclusions

Under alternative A, the Missouri River corridor would not be identified as an administratively designated area and would continue to be managed according to direction provided in the 1986 Helena NF plan. Recreation and interpretation along the corridor would continue to be managed through site specific and case-by-case management decisions on the Forest.

In alternatives B- F, plan components for the Missouri River Corridor would be established. By providing the plan components outlined in the action alternatives, the HLC NF would meet the purpose and need of the Plan, ensuring that the river corridor is managed for the natural and cultural resources that make this unique area.

### *3.21.19 Smith River Corridor, affected environment*

The Smith River is a nationally recognized river noted for its fishing, outstanding scenery, and the opportunities it provides for a 60-mile float through private, state, and NFS lands during the late spring and early summer months. The Smith River Corridor is approximately 3,330 acres in size and consists of the federal lands within ¼ mile on both sides of the river. The majority of the Smith River Corridor is in the Little Belts GA. However, the southern portion lies within the Dry Range which is located within the Big Belts GA. HLC NFS lands bordering the Smith River are heavily used for recreation. The FS manages the lands along the Smith River through a cooperative agreement with MFWP.

### *3.21.20 Smith River Corridor, environmental consequences*

#### Effects common to all alternatives

Under all alternatives, the Smith River Corridor would continue to provide water-based recreation opportunities and recreation special use permits for outfitter guide operations. Additionally, the Plan would not alter the cooperative agreement between the FS and MFWP for the overall management of the Smith River corridor as the Smith River State Park.

## Effects common to all action alternatives

The plan components developed for the Smith River Corridor would be the same in all action alternatives. These plan components focus on protecting and enhancing the natural and cultural values along the Smith River. Table 204 summarizes the expected effects of plan components for the Smith River Corridor.

**Table 204. Summary of plan components for Smith River Corridor**

Plan component	Expected effects of plan components for Smith River Corridor
LB-SMITH-DC-01 LB-SMITH-DC-04	These DCs guide the recreation settings and opportunities and ensure that they are compatible with ecological and cultural/historic features within the corridor.
LB-SMITH-DC-02 LB-SMITH-GDL-01	High scenic values are desired within the Smith River Corridor and these values would be managed at High or Very High SIOs.
LB-SMITH-DC-03	The DC for the cultural and historic values is to conserve, protect, and/or enhance the identified values in the Smith River Corridor. Interpretation would be provided to enhance visitor appreciation for the area.
LB-SMITH-GO-01	This plan component promotes working collaboratively with partners and volunteers to operate, maintain, and deliver river floating opportunities in the Smith River Corridor.
LB-SMITH-SUIT-01	The Smith River Corridor would be unsuitable for timber production, although vegetation treatments could occur for reasons of public safety and enhancing the recreation or aesthetic values along the river.

### *Effects from forest plan components associated with:*

#### **Aquatic ecosystems and soil management**

Plan components and activities related to watershed, soil, riparian, or aquatic habitat improvements would influence the management of the Smith River Corridor, primarily through the management of RMZs. East of the Continental Divide, RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. Plan components for the management of RMZs would help ensure that desirable conditions are maintained or promoted.

#### **Fire and fuels management**

Natural, unplanned ignitions and prescribed fires may be used to maintain ecological conditions in the corridor. Plan components for fire and fuels management would encourage an appropriate management response to wildfires and provide opportunities for natural fire to promote and/or enhance the characteristics of the area.

#### **Timber and vegetation management**

The Smith River Corridor is not suitable for timber production, but harvest may be allowed to provide for public safety and enhance the recreational or aesthetic values of the corridor. Where harvest does occur, it could impact the scenic values in the corridor, including more open vegetation and stumps, as well as soil disturbance in the short term. Conversely, harvest could be used to improve the scenic quality by creating vistas, mimic vegetation structures that would be created by natural disturbance, promoting healthy vegetation, and mitigating hazard trees in public use areas. Vegetation plan components would help define the objectives for treatments. Plan components would allow for other vegetation treatments such as tree planting and weed spraying, which could further enhance the scenic quality of the corridor.

#### **Recreation and scenery management**

Recreation and scenery management plan components would complement the management of the Smith River Corridor by specifying ROS settings and scenic quality objectives that are consistent with maintaining or moving toward the desired conditions of the corridor, along with providing the facilities and infrastructure needed for the public to access and use the area.

### Cultural, historic, and tribal resource management

Plan components for cultural, historic, and tribal resources would complement the management of this area by protecting the unique characteristics of the area.

### Road access and infrastructure

Plan components for road access and infrastructure would help ensure that roads that may occur in proximity to the corridors are maintained in a condition that protects the resources of the area.

### Minerals management

Lands within the Smith River Corridor would be available for minerals activities.

### Alternative A, no action

Under alternative A, the Smith River corridor would not be identified as an administratively designated area and would continue to be managed according to direction provided in the 1986 Helena and Lewis and Clark NF Plans. There is no specific direction in either existing forest plan but there is overall direction for dispersed recreation areas, cultural and natural resources, and eligible WSRs (Lewis and Clark NF plan only) that would apply. Table 205 displays the components from the existing 1986 Forest Plans that would provide guidance for the Smith River Corridor in alternative A.

**Table 205. Summary of 1986 Plan components for the Smith River Corridor**

Plan component	Summary of 1986 plan components for the Smith River Corridor area
Helena NF Goals 1, 2, 9, 10, and 18	These components provide for a range of outdoor recreation opportunities that could be developed for visitor use and satisfaction. Developed recreation sites, boat docks and landings, trails, and interpretive sites within the area would continue to be popular with locals as well as out of state visitors. Permitted river float trips to the area for fishing and camping would continue to affect the many natural and cultural features in the river corridor.
Helena NF Objectives	The Smith River corridor provides nonmotorized boat access to a diverse ecosystem along the Smith River. The objectives in the 1986 Helena NF Plan would provide guidance for this area would be recreation, visual, cultural, water, fish and wildlife.
Helena NF Management Area R-1	The R-1 management area provides direction for large blocks of undeveloped lands suited for dispersed recreation. The Smith River flows through larger blocks of undeveloped lands interspersed with private lands that have more development and the undeveloped lands would provide semiprimitive nonmotorized recreation settings.
Lewis and Clark NF Goals 1, 3, 7, and 11	These plan components provide for the protection and improvement of visual quality, high quality wildlife and fish habitat, quality and quantity of water, and protecting the existing condition and outstandingly remarkable values of eligible WSRs.
Lewis and Clark NF Objectives	The Smith River corridor provides nonmotorized boat access to a diverse ecosystem along the Smith River. The objectives in the 1986 Lewis and Clark NF Plan provide guidance for recreation, visual, cultural, water, wildlife and fish and WSRs.
Lewis and Clark NF Forestwide Standards W-1, W- 2, W-3	The forestwide standards for eligible wild, scenic, and recreation rivers on the Lewis and Clark NF focus on protecting the outstandingly remarkable values identified for the eligible rivers.

### Alternatives B-F

See effects common to all action alternatives.

### Conclusions

In all alternatives, the Smith River Corridor would continue to be managed through cooperative agreement with MFWP. Under alternative A, the Smith River Corridor would not be identified as an administratively

designated area and would continue to be managed according to direction provided in the 1986 Forest Plans. Designated dispersed recreation sites along the river corridor and outfitter and guide special use permits would continue to be managed through site-specific and case-by-case management decisions.

In alternatives B- F, plan components for the Smith River Corridor would be established. By providing the plan components outlined in the action alternatives, the HLC NF would meet the purpose and need of the Plan, ensuring that the river corridor is managed for the natural and cultural resources that make it a unique and special place.

### ***3.21.21 South Hills Recreation Area, affected environment***

The South Hills Recreation Area is located just to the south and west and adjacent to the community of Helena, Montana. It is approximately 50,181 acres in size and extends to MacDonald Pass and the Continental Divide. This large landscape includes lands in and around private land ownership, shares boundaries with the City of Helena, and has shared jurisdiction with the City of Helena on many of the trails nearest the community. Additionally, the area includes large portions of nonmotorized inventory roadless areas as well as portions of the Continental Divide National Scenic Trail. This area is identified for alternatives B, C, D, and F. It is not included in alternatives A or E.

### ***3.21.22 South Hills Recreation Area, environmental consequences***

Effects common to all action alternatives

*Effects from forest plan components associated with:*

#### **Aquatic ecosystems and soil management**

Plan components and management activities for aquatic ecosystems and soil management would affect the management of the South Hills Recreation Area. The plan components that may have the greatest influence are those associated with RMZs. East of the Continental Divide, RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. West of the Continental Divide, the area influenced by riparian plan components is the same across all alternatives because RMZs would be defined the same way as riparian habitat conservation zones are in the no-action alternative.

Vegetation treatments such as prescribed fire and harvest that may occur in the South Hills Recreation Area would be limited or modified in RMZs. Riparian area plan components may limit or influence recreation-related activities, such as trail construction or maintenance, within the RMZs. The area on which these components apply is greater with the action alternatives than with the no-action alternative east of the Continental Divide.

#### **Fire and fuels management**

Plan components for fire and fuels management would encourage an appropriate management response to wildfires that may occur within the South Hills Recreation Area and provide opportunities for natural fire to influence the vegetation condition of these areas. If fire does occur, it may alter the aesthetic quality of the landscape and may also create short-term barriers to certain recreation uses (for example, dead trees that need to be cleared from trails). However, the potential negative impacts from fire would be ameliorated by fire and fuels plan components that emphasize hazardous fuel mitigation in high-use areas such as the South Hills Recreation Area. Fire management activities may help meet the desired conditions described in DI-SHRA-DC-03 related to resilience and low fire hazard.

#### **Timber and vegetation management**

The South Hills Recreation Area would not be suitable for timber production, but timber harvest may occur for other resource purposes, specifically for resource management objectives compatible with the recreation values

of the area (DI-SHRA-SUIT-01). Harvest could be used to move towards the desired conditions described in DI-SHRA-DC-03. Plan components associated with timber harvest would ensure that all resource protection measures are met. Plan components related to desired vegetation conditions could influence whether vegetation treatments (such as harvest or management-ignited fires) are conducted and help define the objectives for those treatments.

**Livestock grazing and management**

Livestock grazing could occur in portions of the South Hills Recreation Area. While livestock grazing has the potential to degrade plant communities through factors such as invasive plant spread and damage to riparian areas, plan components emphasize the maintenance of resilient native plant communities as well as desirable riparian area conditions. These components should help protect the ecological integrity of the area.

**Recreation and scenery management**

Plan components for recreation settings, opportunities, and access along with scenery management would complement the management of the South Hills Recreation Area and ensure that potential recreation and other activities, such as restoration treatments, would be consistent with its desired conditions.

**Cultural, historic, and tribal resource management**

Plan components related to cultural, historic, and tribal resource would have little to no effect on the South Hills Recreation Area.

**Road access and infrastructure**

Where road or trail maintenance, construction, or reconstruction activities occur they would be guided by road access and infrastructure plan components which include protections for other resources.

**Minerals management**

Lands within the South Hills Recreation Area would be available for minerals activities.

**Alternative A, no action**

There is currently no direction for the South Hills Recreation Area in the 1986 Helena NF Plan. However, there is plan direction for roadless areas and dispersed recreation areas that would apply to this area of the Forest. The following plan components from the existing 1986 Helena NF Plan would provide guidance for recreation uses within the area commonly considered the South Hills Recreation Area. This information is summarized in Table 206.

**Table 206. Summary of 1986 Helena Plan components for landscapes in the South Hills Recreation Area**

Plan component	Summary of 1986 plan components for the South Hills Recreation area
Helena NF Goals 1 and 2	These plan components provide for a range of outdoor recreation opportunities that could be developed for visitor use and satisfaction. Trails and trailheads in the area known as the South Hills would continue to be popular with locals as well as out of state visitors. Development of additional trails and trailhead facilities may be necessary to accommodate growth in recreation.
Helena NF Roadless Objective	Mount Helena IRA is located in the area. Additionally, the Lazyman Gulch area, also located within the area known as the South Hills, was formally established as an IRA in 2001. Management of these IRAs for their roadless characteristics would continue into the future.
Helena NF Management Area R-1	The R-1 management area provides direction for large blocks of undeveloped lands suited for dispersed recreation. These lands include the Mount Helena area which is located within the area commonly referred to as the South Hills. The focus in this management area is providing a variety of primitive and semiprimitive nonmotorized recreation opportunities. Motorized activities are generally prohibited in this area and recreation facilities provide access to and support dispersed recreation. Management area-specific standards apply to recreation, visual quality, wildlife, range, timber, water/soils, minerals, protection, and facilities. Due to the proximity to populated areas, there is an emphasis of construction of

Plan component	Summary of 1986 plan components for the South Hills Recreation area
	trailhead facilities and wildlife suppression for this area. Specific restrictions apply to motorized recreation access, livestock animal use months, timber harvest, minerals, and road construction.

### Alternatives B, C, and F

Alternatives B, C, and F identify the South Hills Recreation Area as an area to be managed with specific direction and emphasis. The focus of this area would be on dispersed nonmotorized recreation use provided by a network of trails throughout the area. These areas are supported by facilities such as trail treads and trailheads.

Due to the popularity of the South Hills Recreation Area and the increased recreation use that this area receives, additional protections would be necessary to ensure safety and to reduce damage to natural and cultural resources. As a result, mountain bike activities would be permitted to occur on FS established roads and trails only. Mountain bike use off of established roads and trails would be prohibited in alternatives B, C, and F.

The South Hills Recreation area would provide a semiprimitive nonmotorized recreation setting, although there are smaller pockets within the overall recreation area that would provide remote and more solitary experiences. Table 207 summarizes the expected effects of each plan component related to the South Hills Recreation Area in alternatives B, C, and F.

**Table 207. Summary of plan components for South Hills Recreation Area (alternatives B, C, and F)**

Plan component	Summary of the plan components for the South Hills Recreation Area
DI-SHRA-DC-01; 02	These DCs establish the South Hills Recreation Area as a nonmotorized area available for a variety of dispersed, trail-oriented, nonmotorized recreation activities.
DI-SHRA-DC-03	This DC provides direction to manage the vegetation in the South Hills Recreation Area to support safe recreation experiences. This would include creating vegetative conditions that are resilient to fire disturbances, promote low fire hazards near values at risk, emphasize fire resistant species, and manage for open stands more resistant to wildfire.
DI-SHRA-GO-01	This plan component promotes working collaboratively with partners and volunteer to accomplish work within the South Hills Recreation Area.
DI-SHRA-SUIT-01	The South Hills Recreation Area would not be suitable for timber production, although vegetation treatments could occur if consistent with the recreation values of the area.
DI-SHRA-SUIT-02	Mountain bike activities would be suitable in the South Hills Recreation Area on FS established roads and trails. Mountain bike activities off of designated roads and trails would be prohibited.

### Alternative D

Alternative D is similar to alternatives B, C, and F in that it also identifies the South Hills Recreation Area as an area to be managed with specific direction and emphasis. The focus of the South Hills Recreation Area in alternative D would also be on dispersed nonmotorized recreation use provided by a network of trails throughout the area. Alternative D responds to comments received during public scoping asking the Forest to consider an alternative that increases the amount of RWAs and primitive recreation opportunities on the Forest. Commenters also asked the Forest to consider an alternative in the South Hills Recreation Area that would not allow mountain bike uses in portions of the area.

In response to these comments, alternative D identified a RWA in the Colorado Gulch area. This RWA would be managed for a primitive ROS setting, providing a recreation area within the South Hills Recreation Area

where solitude and primitive recreation opportunities would be provided. Motorized and mechanized means of transportation (including bicycles) would not be allowed within the RWA.

The plan components for alternative D are the same as those developed for alternatives B and C above, except for the following plan component, described in Table 208 below.

**Table 208. Summary of additional plan component for South Hills Recreation Area (alternative D)**

Plan component	Summary of plan components for the South Hills Recreation area (alt D)
DI-SHRA-SUIT-03	This plan component prohibits mountain bike use within the Colorado Mountain RWA and would create a primitive ROS setting within the overall South Hills Recreation Management Area.

## Alternative E

Alternative E responds to comments received during public scoping asking the Forest to consider an alternative that did not identify RWAs and that increased the amounts of NFS lands available for timber harvest. In response to these comments, the South Hills Recreation Area would not be identified in alternative E. By not identifying this area for special recreation management, a subset of these lands would be available for timber production.

Recreation uses of this area would continue unaltered from the existing condition unless impacted by future timber harvesting, road construction, or travel planning. Due to the focus of timber management in this alternative, the ROS settings would shift, resulting in an increase in motorized ROS settings and a decrease in the amount of semiprimitive nonmotorized ROS settings.

There would be no specific plan components for the South Hills Recreation Area for alternative E.

## Conclusions

Alternatives A and E do not identify a specific area designation for this area. Recreation would continue to be managed through site-specific and case-by-case management decisions on the Forest. Travel plans would provide guidance on where motorized uses could and could not occur.

Alternatives B, C, and F would establish the South Hill Recreation Area as an administratively designated area on the HLC NF. By providing the plan components in these alternatives, the HLC NF would meet the purpose and need of the Plan, ensuring that the South Hills Recreation Area is managed in the long term for its semiprimitive nonmotorized recreation uses.

Alternative D would also establish the South Hill Recreation Area as an administratively designated area on the HLC NF. It also would meet the purpose and need of the Plan by providing plan components that would ensure that it is managed for nonmotorized recreation uses into the future. The only exception would be that in addition to semiprimitive nonmotorized settings, this alternative would also provide an area within the South Hills Recreation Area that provides primitive recreation opportunity settings. This primitive area would prohibit the use of mountain bikes.

### ***3.21.23 Elkhorn Wildlife Management Unit, affected environment***

The Elkhorn Mountains are an island mountain range that lies in Broadwater, Jefferson, and Lewis and Clark Counties approximately 18 air miles southeast of Helena, MT. There are approximately 161,251 acres of NFS land within this mountain range; the southwestern portion of the mountain range is within the boundary of the Beaverhead-Deerlodge NF. The landscapes and the vegetation have been substantially altered by historic placer and lode mining, livestock grazing, and recreation. Additionally, in the early years of European settlement, the area was heavily hunted and the populations of many wildlife species in the area were dramatically reduced.



The Elkhorns Wildlife Management Unit was designated in the 1986 Helena NF plan, to be managed to “maintain viable populations of species associated with existing ecosystems”, particularly those requiring “seclusion” (U.S. Department of Agriculture, Forest Service, 1986). The 1986 Helena NF plan and the 1987 Deerlodge Forest Plans include criteria, goals and standards for management of the Elkhorns. These include:

- Emphasis on maintaining or restoring wildlife habitat and values when planning management actions
- restrictions on vehicular access and the use of motorized vehicles
- prohibition on a trans-mountain road
- limits on motorized travel to designated routes or areas (Forest Plan Amendment 10, 1995, related to travel planning)
- maintenance and restoration of visual and historic resources
- designation of the entire area as unsuitable for timber production
- reasonable access to private inholdings and valid mining claims
- development of a cooperative management and monitoring program with Montana Fish, Wildlife and Parks
- establishment of 4 Management Areas with specific goals and standards

Wheeled motorized travel and over-snow travel is currently allowed in the Elkhorns WMU, on roads and trails and in areas designated in the travel management plan. Mechanized uses are also currently allowed throughout the WMU. The 1986 Helena NF plan did not identify recommended wilderness in the Elkhorns, based on findings in the Final Report on the Elkhorns WSA (U.S. Department of Agriculture, Forest Service, 1981), but the central portion (referred to as the “Elkhorns core area” elsewhere in this document) is within an IRA that provides seclusion for wildlife from many human activities.

Cooperative management in the Elkhorns WMU occurs under an MOU that currently includes the HLC NF, the Beaverhead-Deerlodge NF, the Bureau of Land Management, and the USDA Natural Resource Conservation Service.

### ***3.21.24 Elkhorn Wildlife Management Unit, environmental consequences***

#### **Effects common to all alternatives**

The administrative designation of the Elkhorns Wildlife Management Unit would remain in place under all alternatives. Plan components would be structured differently in the action alternatives as compared to the no-action alternative, but all alternatives include components that would ensure the area is managed in a manner consistent with the Elkhorn Management Unit designation described in the affected environment, and the recommendations within the Final Report on the Elkhorn WSA (U.S. Department of Agriculture, Forest Service, 1981). The area would not be suitable for timber production under any alternative.

#### **Effects common to all action alternatives**

Plan components for the Elkhorns GA for all action alternatives were developed to meet direction in the 2012 Planning Rule while retaining the intent of the original management of the Elkhorns WMU as established in the 1986 Helena NF Plan. In the 2021 Land Management Plan, the Elkhorns GA is synonymous with the Elkhorns Wildlife Management Unit. Plan components for this area are therefore found in the Elkhorns GA section of Chapter 3, organized under resource-specific headings (e.g., Watershed, Terrestrial Vegetation, Wildlife, etc). These plan components are addressed by each resource area throughout the FEIS. The plan components specific to management of the Elkhorns as a Wildlife Management Unit are identified in the text of those components.

All action alternatives have similar plan components related to the Elkhorns Wildlife Management Unit. A primary difference between the no-action alternative and the action alternatives is the lack of Management Areas in the action alternatives. Rather than being divided into separate areas with separate goals and standards

based on geography as in the no-action alternative, under all action alternatives the entire Elkhorns WMU would be managed by a suite of forestwide and GA-specific plan components or land allocations (such as ROS categories).

Where forestwide plan components in the Plan addressed the intent of components from the 1986 plan for the Elkhorns WMU, they were not repeated for the GA, because forestwide components would be met in all GAs unless specifically indicated otherwise. For example, in the 1986 Helena NF Plan (no-action alternative), certain MAs are delineated specifically to capture key seasonal wildlife habitats (as identified or understood in 1986) and emphasize their maintenance or restoration; in the action alternatives, those habitats would be managed according to forestwide plan components that direct managers to maintain key seasonal ranges and minimize disturbance on them wherever they occur (e.g. FW-WL-GDL-05, FW-WL-GDL-06, and others). Therefore, under all action alternatives, management of certain resources in the Elkhorns WMU would be consistent with management across the entire HLC NF, with additional, GA-specific direction to address concerns or resources unique to the area or the WMU. (See also, Project Record Document C74 for a comparison of the 1986 and the 2021 plan components for the WMU.)

#### *Effects from forest plan components associated with:*

##### **Aquatic ecosystems and soil management**

Plan components and management activities for aquatic ecosystems and soil management would affect the management of the Elkhorns WMU. The plan components that may have the greatest influence are those associated with RMZs. East of the Continental Divide, RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. Vegetation treatments such as prescribed fire and harvest that may occur would be limited within RMZs or modified to comply with plan components for those areas. The area on which these components apply is greater with the action alternatives than with the no-action alternative. The effect of these plan components would be increased and more consistent protection for riparian ecosystems where they occur in this area.

##### **Fire and fuels management**

Plan components for fire and fuels management would encourage an appropriate management response to wildfires that may occur within the Elkhorns WMU and provide opportunities for natural fire to influence the vegetation condition of this area.

##### **Timber and vegetation management**

Under all alternatives, timber harvest and other vegetation management activities, such as reforestation, prescribed fire, and fuel reduction activities could occur within the Elkhorn Wildlife Management Unit. Plan components would ensure that these activities improve wildlife habitat, restore or maintain desired vegetation conditions, reduce hazardous fuels, and/or protect values at risk. Prescribed fire could potentially be used anywhere in the GA. Projects with a purpose of restoration or maintenance of desired vegetation conditions could include maintaining or increasing nonforested plant communities, reducing conifer encroachment, promoting large trees and open forests, and increasing or promoting species such as limber pine, ponderosa pine, aspen, and whitebark pine.

While the Elkhorns GA would be unsuitable for timber production, timber harvest could be used in areas that do not specifically preclude this activity. The Timber section displays the area where harvest could be allowed in the Elkhorns GA, including and excluding IRAs. While some very limited amounts of harvest could potentially occur in IRAs, it would be restricted by the terms of the 2001 Roadless Area Conservation Rule, and due to accessibility is unlikely to occur in the Elkhorns Wildlife Management Unit. Timber harvest could occur on a similar area under all alternatives.

The modeling done to analyze terrestrial vegetation included treatment constraints and opportunities in the Elkhorns GA, as well as expected natural disturbances and processes. Please refer to the terrestrial vegetation section and appendix H for the expected trend of vegetation in the Elkhorns GA.

**Livestock grazing and management**

Livestock grazing may occur in portions of the Elkhorns wildlife management unit. While livestock grazing has the potential to degrade plant communities through factors such as invasive plant spread and damage to riparian areas, plan components emphasize the maintenance of resilient native plant communities as well as desirable riparian area conditions. These components would help protect the ecological integrity of the area.

**Wildlife habitat management**

Forestwide plan components for wildlife habitat management would complement the specific wildlife management plan components associated with the Elkhorns GA and Wildlife Management Unit. Plan components tied to the purpose of the WMU would ensure that management, enhancement, and restoration of wildlife habitats would be the priority for resource management (EH-WL-GDL-01), and that permitted activities include conditions to reduce potential impacts of those activities on wildlife and wildlife habitats (EH-WL-GDL-02 and 03). The effect of these plan components, combined with forestwide plan components related to wildlife habitats would be to maintain, restore, or enhance wildlife habitats and to minimize the impacts of a wide array of human uses in the Elkhorns WMU.

**Recreation and scenery management**

Plan components for recreation settings, opportunities, and access along with scenery management would complement the management of the Elkhorns Wildlife Management Unit and ensure that potential recreation and other activities, such as restoration treatments, would be consistent with its desired conditions for wildlife habitat.

**Cultural, historic, and tribal resource management**

Plan components related to cultural, historic, and tribal resource would have little to no effect on the Elkhorns Wildlife Management Unit.

**Lands Special Uses**

One designated electric energy corridor is located in the southwest corner of the Elkhorn GA per the *Designation of Energy Corridors on Federal Lands in the 11 Western States* (U.S. Department of Agriculture, Forest Service, 2009b). If proposals for new energy construction within the designated corridor are received, Lands Special Use regulations would apply.

**Road access and infrastructure**

Where road or trail maintenance, construction, or reconstruction activities occur they would be guided by road access and infrastructure plan components which include protections for other resources, as well as by constraints in plan components for other resources.

**Minerals management**

The Elkhorns would be available for locatable minerals activities. Plan components for activities related to minerals would require no surface occupancy where practicable in specified wildlife habitats, thereby limiting potential impacts to some wildlife.

**Alternative A, no action**

The existing 1986 Forest Plan for the Helena NF includes guidance for the Elkhorn Wildlife Management Unit, as summarized in Table 209.

**Table 209. Summary of 1986 Helena Plan components for Elkhorns Wildlife Management Unit**

Plan component	Summary of the 1986 Helena Plan components for the Elkhorns Wildlife Management Unit
Management Area Elkhorns-1	The plan components provide direction for lands in the lower Crow Creek, Johnny Gulch, Slim Sam, lower Indian Creek, Kimber Gulch, Whitehorse Creek, Spokane Creek and Sheep Creek drainages in the norther, southern, and eastern portions of the Elkhorn Mountain Range. The focus is elk winter range, with goals including but not limited to improving vegetation through livestock management and prescribed fire. MA-specific standards apply to recreation, visual quality, wildlife, range, timber, water/soils, minerals, protection, and facilities. These standards would result in promoting winter elk security and elk winter range values. Specific restrictions apply to motorized winter recreation, livestock AUMs, timber harvest, minerals, and open roads.
Management Area Elkhorns-2	The plan components provide direction for lands in the unroaded areas within the central and western portions of the Elkhorns. This includes areas in the higher elevations (6,500 to 9,400 feet) in the upper Beaver Creek drainage, Casey Peak, High Peak, Casey Meadows, the upper Tizer Basin, Crow Peak, and Elkhorn Peak. The focus is maintaining or enhancing mountain goat and elk summer range. Goals for this area provide for other resource objectives, if they can be accomplished with minimal development while optimizing mountain goat and elk summer habitat. Specific standards apply to recreation, visual quality, wildlife, range, timber, water/soils, minerals, protection, and facilities. These standards would result in improving security for wildlife species and mountain goat and elk summer habitat. Restrictions apply to motorized summer recreation, livestock AUMs, timber harvest, minerals, and road construction.
Management Area Elkhorns-3	The plan components provide direction for lands in high elevations (6,000-7,000 feet) in the east-central and northeast portions of the Elkhorns. This includes portions of the Tizer Basin, Crow Creek drainage, and numerous small drainages. The focus of this management area is elk calving and summer range. Goals also focused on maintaining and enhancing moose, mule deer, and other wildlife habitat if they are compatible with elk calving and summer habitat. Management area-specific standards apply to recreation, visual quality, wildlife, range, timber, water/soils, minerals, protection, and facilities. These standards would result in improving security for elk calving and summer habitat. Specific restrictions apply to limiting motorized dispersed recreation, livestock AUMs, timber harvest, minerals, and road locations and densities.
Management Area Elkhorns-4	The plan components emphasize big game habitat management in the northwest portion of the Elkhorns Mountain Range. This area includes the McClellan Creek drainage and number of smaller drainages that drain west into Prickly Pear Creek. The focus is the optimization of moose, elk, and mule deer habitat and the maintenance or improvement of water quality and stream stability in McClellan Creek which contributes to the municipal water supply for East Helena. Specific standards apply to recreation, visual quality, wildlife, range, timber, water/soils, minerals, protection, and facilities. These standards would result in maintaining and enhancing big game wildlife habitat. Specific restrictions apply to motorized uses, livestock animal use months, timber harvest, minerals, and road locations and densities.

Management as directed by the plan components in Alternative A would continue to meet the intent of the WMU designation but would lack some consistency with management for certain resources among the different MAs. By retaining geographically-based MAs, Alternative A lacks some flexibility in adjusting management in response to changes that may occur from natural disturbances, changes in wildlife populations or use of the landscape, or from management and human uses on non-NFS lands that adjoin the WMU as compared to the action alternatives.

### Alternatives B and E

Under alternatives B and E there would be no anticipated changes to recreation relative to the existing condition. The core area of the Elkhorns is largely encompassed by an IRA, which would contribute to the availability of secluded habitat conditions. Mechanized means of transportation on the trails in this area could

result in wildlife disturbance or displacement during the summer months, but this is not likely to be substantially greater than the displacement caused by foot or equestrian travel. Over-snow motorized use would be suitable and consistent with current travel plans. Where it is permitted, this use has the potential to displace or disturb wildlife during the winter months. Refer to appendix A for a map of the ROS settings for these alternatives.

### Alternative C

Alternative C responds to comments received during public scoping asking the Forest to consider prohibiting the use of mechanized means of transportation (e.g., mountain bikes) in the Elkhorns core area (see map E-19 in appendix A) to provide a more undeveloped recreation setting. In alternative C, mechanized means of transportation would be prohibited from using approximately 59 miles of nonmotorized trails in a core area of the Elkhorns GA. These nonmotorized trails would be open to other nonmotorized uses.

This feature of alternative C would eliminate the potential of mechanized means of transportation (e.g., mountain bikes) to disturb or displace wildlife in the core area; this effect would generally only occur in the summer months, which is a less vulnerable time for most wildlife species as compared to winter. Excluding mechanized means of transportation (mountain bikes) could incrementally improve the quality of habitat for species that require seclusion primarily by reducing the total amount of recreational use in the area. However, foot and equestrian travel could still occur, and the magnitude of this effect is unlikely to be detectable.

Additionally, alternative C changes 19,026 acres of the winter ROS setting in a portion of the area from semiprimitive motorized, which is suitable for over-snow motorized uses (including snowmobiling), to semiprimitive nonmotorized, in which those uses would not be suitable. This would occur on an area in the northwestern portion of the GA (see map in appendix A). Snowmobiling would continue to be suitable within roaded natural settings along roads. By reducing suitability for over-snow motorized use, the quality of habitat for species that require seclusion would be improved in these areas in the winter in alternative C as compared to alternatives A, B, D and E. This improvement would correspond to the time of year when species such as elk are most vulnerable to stress.

### Alternative D

Alternative D responds to comments received during public scoping asking the Forest to consider an alternative that identified a need to provide additional primitive, undeveloped recreation opportunities in the Elkhorns GA. This was accomplished by specifying a primitive ROS setting for an area in the central Elkhorns (see appendix A for a map). This would result in a shift in the ROS settings, increasing the number of primitive classes in both summer and winter seasons. A primitive ROS setting would result in motorized uses no longer being suitable in this area. Creating this primitive area would reduce the acres suitable for over snow winter recreation by 17,878 acres.

The area specified with a primitive ROS setting is generally the same as the Elkhorns core area identified in alternative C where mechanized means of transportation would not be suitable. However, under alternative D mechanized means of transportation would be suitable in this area, while motorized uses would not. Removing the suitability for motorized uses in the winter would potentially increase the amount of habitat for species requiring seclusion and reduce the potential for displacement or disturbance of these species during a time when they are the most vulnerable to stress. The overall net potential improvement to habitat seclusion would be greater in alternative D than in other alternatives.

### Alternative F

Alternative F would establish a primitive ROS setting for the same area in the central Elkhorns (see appendix A for a map) as in alternative D. This would result in a shift in the ROS settings, increasing the number of primitive classes in both summer and winter seasons. A primitive ROS setting would result in motorized uses

no longer being suitable in this area. Creating this primitive area would reduce the acres suitable for over snow winter recreation by 17,878 acres.

The area specified with a primitive ROS setting is generally the same as the Elkhorns core area identified in alternative C where no mechanized means of transportation would occur. However, under alternative F (as in D) mechanized means of transportation would be suitable in this area, while motorized uses would not. Removing the suitability for motorized uses in the winter would potentially increase the amount of habitat for species requiring seclusion and reduce the potential for displacement or disturbance of these species during a time when they are the most vulnerable to stress.

Additionally, alternative F incorporates the changes to the winter ROS setting in a portion of the area, as in alternative C. 19,026 acres would change from semiprimitive motorized, which is suitable for over-snow motorized uses (including snowmobiling), to semiprimitive nonmotorized, in which those uses would not be suitable. This would occur on an area in the northwestern portion of the GA (see map in appendix A). Snowmobiling would continue to be suitable within roaded natural settings along roads.

By reducing suitability for over-snow motorized use in the northwestern portion of the GA (as in alternative C), and also incorporating the primitive ROS setting for the core area, (as in alternative D), alternative F provides the greatest increase in the amount of habitat for species that require seclusion as compared to all of the other alternatives. This improvement would correspond to the time of year when species such as elk are most vulnerable to stress.

### Cumulative Effects

#### *Changing human population*

Additional stressors that may increase in the future is increasing population, with resulting increasing demands and pressures on public lands. Locally, at present populations are increasing in the counties on the west side of the planning area but are declining or stable in other areas. These changes may lead to increased demands for recreational use, including hunting, in the Elkhorns Wildlife Management Unit. This pressure may elevate the importance of providing for habitat needs of wildlife.

#### *Management of adjacent lands*

Portions of the HLC NF adjoin other NFs, each having its own forest plan. The HLC NF is also intermixed with lands of other ownerships, including private lands, other federal lands, and state lands. The Elkhorns Wildlife Management Unit encompasses portions of the Beaverhead-Deerlodge NF as well state, private, and BLM lands. This area is unique in that a memorandum of understanding is in place to ensure seamless management of the area occurs across agency boundaries.

Some adjacent lands are subject to their own resource management plans. The cumulative effects of these plans in conjunction with the 2021 Land Management Plan are summarized in Table 210, for those plans applicable to the Elkhorns Wildlife Management Unit.

**Table 210. Summary of cumulative effects to the Elkhorns Wildlife Management Unit from other resource management plans**

Resource plan	Description and Summary of effects
Beaverhead-Deerlodge National Forest Plan	To ensure seamless management, the entire Elkhorns Wildlife Management Unit is guided by the HLC NF 2021 Land Management Plan. Therefore, there is no potential for conflict with the Beaverhead-Deerlodge NF plan with respect to this area.
Montana Statewide Forest Resource Strategy (2010)	This plan guides forest management on state lands. It includes many concepts that are complementary to plan components for the HLC NF, including providing wildlife habitat. This strategy supports the management of the Elkhorns Wildlife Management unit which occurs cooperatively across agencies.

Resource plan	Description and Summary of effects
BLM Resource Management Plans (RMP)	BLM lands in the Elkhorns Wildlife Management Unit is managed by the Butte field office. The Butte plan was recently revised (2009). This plan contains components that complement the 2021 Land Management Plan (all alternatives) and supports the management of the area cooperatively across agencies.
Montana Army National Guard – Integrated Natural Resources Management Plan for the Limestone Hills Training Area 2014	This plan is relevant to an area adjacent to NFS lands in the Elkhorns GA. The Limestone Hills area is primarily nonforested and calls for managing for fire-resilient vegetation as well as restoration of native vegetation. This plan would be generally complementary to the management of the Elkhorns Wildlife Management Unit with regards to promoting the health of native vegetation. However, the disturbances that occur in this area may displace wildlife and increase the importance of seclusion on lands of other ownerships.
Montana's State Wildlife Action Plan	This plan describes a variety of vegetation conditions related to habitat for wildlife. This plan would be complementary to the habitat goals for the Elkhorn Wildlife management unit and support the management of the area cooperatively across agencies.
County wildfire protection plans	Some county wildfire protection plans map and/or define the WUI. Where WUI occurs in the Elkhorns Wildlife Management Unit, these plans would support an emphasis on restoration and fuels reduction, which is consistent with plan components.

## Conclusions

Under all alternatives, the Elkhorns Wildlife Management Unit would be managed in a manner consistent with its original purpose for establishment.

- The action alternatives place a greater emphasis on restoration activities to improve wildlife habitat and to meet other resource objectives as compared to alternative A.
- The effects of alternatives B and E would be generally the same as alternative A. Mechanized use on nonmotorized trails has the potential to disturb wildlife in the summer months. Where it is suitable, motorized over-snow use has the potential to displace or disturb wildlife in the winter.
- In alternative C, the exclusion of mechanized use in the Elkhorns core area may incrementally increase or improve the quality of habitat for species that require seclusion. However, foot and equestrian travel would still be suitable, and wildlife are generally less vulnerable when this use would occur (summer); therefore, the magnitude of this effect would be negligible.
- In alternative C, habitat quality for species that require seclusion would be improved in an area in the northwestern part of the GA due to removal of suitability for motorized over-snow uses. This improvement would correspond to the time of year when species such as elk are most vulnerable.
- In alternative D and F, the area in the Elkhorns core area would be designated as a primitive ROS setting, where mechanized use would be suitable but motorized uses would not, including over-snow uses. The overall net potential improvement to secluded habitat would be greatest in these alternatives.

### ***3.21.25 Kings Hill Scenic Byway, affected environment***

The Kings Hill Scenic Byway is a 71-mile long National Forest Scenic Byway that begins at the junction of US Highways 89 and 12 near White Sulphur Springs, MT. Approximately 40 miles of the byway passes through NFS lands located in the Little Belts GA. The route provides access to NFS campgrounds, numerous dispersed camping opportunities, cross-country and downhill skiing, snowmobile play areas, and numerous trails and roads. Several interpretive signs along the route highlight the many scenic, historic, and recreation features found along the scenic byway. Some of these signs are in NFS lands but several are located in private and state lands and provide interpretations to these lands as well.

### 3.21.26 Kings Hill Scenic Byway, environmental consequences

#### Effects common to all alternatives

Under all alternatives, the Kings Hill Scenic Byway would continue to be emphasized for providing access to and interpretation of the landscape and history of the area, and the many outdoor recreation opportunities accessed by the route.

#### Effects common to all action alternatives

Plan components developed for the Kings Hill Scenic Byway would remain the same in all action alternatives. These plan components focus on protecting and enhancing the scenic qualities along the route as well as providing guidance for interpretation and signage in the area. Table 211 summarizes the expected effects of each plan component related to the Kings Hill Scenic Byway.

**Table 211. Summary of plan components for Kings Hill Scenic Byway**

Plan component	Summary of plan components for Kings Hill Scenic Byway
LB-KHSB-DC-01	This DC ensures that the scenic quality along the Kings Hill Scenic Byway is natural appearing and provides high scenic values.
LB-KHSB-DC-02 LB-KHSB-DC-03	This DC ensures that the interpretive and recreation infrastructure located along the Kings Hill scenic byway protect, complement, and promote the intrinsic scenic values along this route, and is cohesive and enhances the appreciation of the natural and cultural landscapes of this area.
LB-KHSB-GO-01	This GO aims to update, promote, and maintain the interpretation and signing along the scenic byway with assistance from partnerships with local and state highway districts and volunteers.
LB-KHSB-GDL-01	This GDL provides direction for the protection of scenic quality during the implementation of management activities along the Kings Hill Scenic Byway. This guidance should provide a consistent approach to the management of scenery along the route.

#### *Effects from forest plan components associated with:*

##### **Aquatic ecosystems and soil management**

Plan components and activities associated with aquatic ecosystems and soil management would have no measurable influence on the King's Hill Scenic Byway.

##### **Fire and fuels management**

Plan components for fire and fuels management would encourage an appropriate management response to wildfires that may occur near the King's Hill Scenic Byway and provide opportunities for natural fire to alter the vegetation condition of the landscape. When fire does occur, whether natural or management-ignited, it could change the scenery visible from the road, including charred vegetation in the short term as well as regrowth in the longer term. Fire on the landscape is a natural process that would generally complement the scenic quality objectives for the King's Hill Scenic Byway.

##### **Timber and vegetation management**

The area surrounding the King's Hill Scenic Byway is unsuitable for timber production, but harvest and other vegetation management activities could occur to provide for public safety and/or to enhance the recreational and scenic values of the area. Where harvest does occur, it could impact the scenic values visible from the road, including more open vegetation and stumps, as well as soil disturbance in the short term. However, harvest could be used to improve the scenic quality by creating vistas, mimic vegetation structures that would be created by natural disturbance, promote healthy vegetation, and remove hazardous trees. Vegetation plan components would help define the objectives for treatments. In addition to harvest, plan components would allow for other vegetation treatments such as tree planting and weed spraying, which could further enhance the



scenic quality of the byway. All vegetation treatments would be designed to meet the required SIO of the byway (high).

### **Livestock grazing and management**

Plan components and activities associated with livestock grazing are not likely to have an effect on the King's Hill Scenic Byway.

### **Recreation and scenery management**

Recreation and scenery management plan components would complement the management of the King's Hill Scenic Byway by specifying ROS settings and scenic quality objectives that are consistent with maintaining or moving toward the desired conditions of the byway, along with providing the facilities and infrastructure needed for public access and interpretation.

### **Wildlife habitat management**

Plan components and activities associated with wildlife habitat management are not likely to influence the King's Hill Scenic Byway.

### **Cultural, historic, and tribal resource management**

Plan components and activities associated with cultural, historic, and tribal resource management are not likely to influence the King's Hill Scenic Byway.

### **Road access and infrastructure**

Plan components associated with road access and infrastructure would have little effect on the management of the King's Hill Scenic Byway because the highway itself is not maintained by the FS.

### **Minerals management**

Lands along the Kings Hill Scenic Byway would be available for mineral activities.

### **Alternative A, no action**

Table 212 summarizes the 1986 Lewis and Clark plan components for the Kings Hill Scenic Byway. Several plan components guide the management of the visual resource within the seen areas from this major route. The Kings Hill Scenic Byway is also managed through the Scenic Byway Master Plan, a separate plan developed in 1992 that provides guidance for the interpretation sites along the scenic byway as it passes through the Forest.

**Table 212. Summary of 1986 Lewis and Clark plan components for Kings Hill Scenic Byway**

<b>Plan component</b>	<b>Summary of 1986 Lewis and Clark plan components for the Kings Hill Scenic Byway area</b>
Lewis and Clark NF Goal 1	This goal provides for resource development and use activities so long as land and resource quality and productivity are protected and/or improved. This direction includes the consideration of natural beauty.
Lewis and Clark NF Objectives	Visual resource management would be emphasized in areas seen from identified visually sensitive roads and trails.
Lewis and Clark NF Forest-wide Standard A-8	Highway 89, Kings Hill Scenic Byway, is identified as a Sensitivity Level 1 viewpoint. Seen areas from Sensitivity Level 1 roads occur in different management areas with different prescriptions, however, views from them are important and would be managed to reflect visual quality objectives.
Lewis and Clark NF Management Area A	This management area identifies the high scenic values near US Highway 89 (Kings Hill Scenic Byway). Scenic values would be protected, maintained or enhances along this highway. The visual quality objectives of retention and partial retention would be met.
Lewis and Clark NF Forest Plan Amendment 16	This plan amendment recognizes the importance of the scenic values along US Highway 89 and increase the number of acres next to the route to protect and enhance those scenic values.

**Alternatives B-F**

See effects common to all action alternatives.

**Conclusions**

There is currently no specific direction for the Kings Hill Scenic Byway in the 1986 Lewis and Clark Forest Plan. In alternative A, the no-action alternative, direction for the scenic byway would continue to be provided through the Scenic Byway Master Plan, a separate plan developed in 1992 to provide guidance for the interpretative sites along the scenic byway as it passes through the Forest.

In the action alternatives, (alternatives B- F) all plan components for the Kings Hill Scenic Byway would remain the same. By providing the plan components outlined in the action alternatives, the HLC NF would meet the purpose and need of the Plan, ensuring that the nature and purposes for which the Kings Hill Scenic Byway was identified is enhanced and/or protected for present and future generations.

**3.21.27 Badger Two Medicine, affected environment**

The area commonly known as the Badger Two Medicine encompasses approximately 129,740 acres at the northern end of the Rocky Mountain Range GA. The majority of this area is located within the Badger-Two Medicine Traditional Cultural District, an area acknowledged for its significance to the oral traditions and culture practices of the Blackfeet people, who have used the lands for traditional purposes for generations and continue to value the area as important to maintaining their community’s continuing cultural identity.

The Badger Two Medicine also falls within the 1895 Agreement with the Indians of the Blackfeet Indian Reservation in Montana, which states that the Blackfeet Nation will retain treaty rights to extract timber, fish, and hunt in the Badger Two Medicine area.

**3.21.28 Badger Two Medicine, environmental consequences**

**Effects common to all alternatives**

Under all alternatives, the Badger Two Medicine would continue to provide primitive and semiprimitive nonmotorized recreation opportunity settings. The Badger Two Medicine Traditional Cultural District would remain intact and would continue to acknowledge the significance of this area to the Blackfeet people. The 1895 Agreement with the Indians of the Blackfeet Indian Reservation in Montana would continue to provide the Blackfeet Nation with treaty rights to extract timber, fish, and hunt in the Badger Two Medicine area.

Variations for travel for traditional and cultural purposes would be permitted to meet treaty obligations with the Blackfeet Nation and to protect or enhance the Badger Two Medicine Traditional Cultural District in all of the alternatives.

**Effects common to all action alternatives**

The plan components developed for the Badger Two Medicine area would remain the same in all action alternatives. These plan components focus on protecting and enhancing the natural and cultural values throughout the Badger Two Medicine area. Table 213 summarizes each plan component related to the Badger Two Medicine area.

**Table 213. Summary of plan components for Badger Two Medicine**

Plan component	Summary of plan components for the Badger Two Medicine
RM-BTM-DC-01	This DC identifies that the Badger Two Medicine is a special area of the Blackfeet Nation and should be managed as a large undeveloped landscape with important traditional and cultural values.

Plan component	Summary of plan components for the Badger Two Medicine
RM-BTM-DC-02	This DC recognizes the outstanding natural and ecological environment of the Badger Two Medicine area and provides for management actions only to the extent that they do not detract from the natural settings and are in harmony with the purposes of the Badger Two Medicine Traditional Cultural District.
RM-BTM-DC-03	This DC acknowledges that the Badger Two Medicine has value for education and research opportunities.
RM-BTM-STD-01	This STD ensures that the Badger Two Medicine is managed in close consultation with the Blackfeet Nation to fulfill Blackfeet treaty rights and the federal Indian trust respectively. The area shall protect and honor the Blackfeet reserved rights and sacred lands. The uses of the area must be compatible with desired conditions with compatibility determined through government to government consultations.
RM-BTM-STD-02	Blackfeet tribal members shall have access to the Badger Two Medicine for the exercise of reserved treaty rights, and opportunities to practice spiritual, ceremonial, and cultural activities.
RM-BTM-SUIT-01	Lands within the Badger Two Medicine would not be suitable for timber production, but timber harvest may be used to emphasize habitat restoration, hazardous fuel reduction, and support tribal treaty rights.

*Effects from forest plan components associated with:*

**Aquatic ecosystems and soil management**

Plan components and management activities for aquatic ecosystems and soil management may affect the management of the Badger Two Medicine. The plan components that may have the greatest influence are those associated with RMZs. East of the Continental Divide, RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. Vegetation treatments such as prescribed fire and harvest that may occur would be limited within RMZs or modified to comply with plan components for those areas. Riparian area plan components may also limit or influence recreation-related activities, such as trail construction or maintenance, within the RMZs. The area on which these components apply is greater with the action alternatives than with the no-action alternative.

**Fire and fuels management**

Plan components for fire and fuels management would encourage an appropriate management response to wildfires that may occur within the Badger Two Medicine area and provide opportunities for natural fire to influence the vegetation condition of this area.

**Timber and vegetation management**

The Badger Two Medicine area is not suitable for timber production, but timber harvest may occur for other resource purposes, specifically for habitat restoration, hazardous fuel reduction, and to support tribal treaty rights (RM-BTM-SUIT-01). Plan components associated with timber harvest would ensure that all resource protection measures are met. Plan components related to desired vegetation conditions could influence whether vegetation treatments (such as harvest or management-ignited fires) are conducted and help define the objectives for those treatments.

**Livestock grazing and management**

While livestock grazing itself has the potential to degrade plant communities through factors such as invasive plant spread and damage to riparian areas, plan components emphasize the maintenance of resilient native plant communities as well as desirable riparian area conditions. These components would help protect the ecological integrity of the area.

**Recreation and scenery management**

Plan components for recreation settings, opportunities, and scenery management would complement the management of the Badger Two Medicine area by establishing ROS settings and SIOs consistent with the desired conditions for the area.

**Cultural, historic, and tribal resource management**

Plan components related to cultural, historic, and tribal resource would help preserve these important features of the Badger Two Medicine area.

**Road access and infrastructure**

Where road or trail maintenance, construction, or reconstruction activities occur they would be guided by road access and infrastructure plan components which include protections for other resources.

**Minerals management**

In 2006, Public Law 109-432 withdrew the lands in the Badger Two Medicine area from mineral entry. Locatable mineral activities may still occur within the areas that have been withdrawn as long as a proponent has demonstrated they have a valid existing right.

**Alternative A, no action**

Under alternative A, the Badger Two Medicine would not be identified as an administratively designated area and would be managed according to direction provided in the 1986 Lewis and Clark Forest Plan. There is no specific direction for the Badger Two Medicine in the 1986 Forest Plan but there is overall direction for cultural and natural resources that would apply. The Badger Two Medicine Traditional Cultural District would remain intact and would continue to acknowledge the significance of this area to the Blackfeet people. The 1895 Agreement with the Indians of the Blackfeet Indian Reservation in Montana would continue to provide the Blackfeet Nation with treaty rights to extract timber, fish, and hunt in the Badger Two Medicine area.

Table 214 displays the general plan components from the existing 1986 Lewis and Clark NF Plan that would provide guidance for the Badger Two Medicine in alternative A.

**Table 214. Summary of 1986 Lewis and Clark plan components for the Badger Two Medicine**

Plan component	Summary of 1986 Lewis and Clark plan components for the Badger Two Medicine
Lewis and Clark NF; Goals 3, 7, 8, and 9	These plan components provide for the protection and improvement high quality wildlife and fish habitat, quality and quantity of water, and protecting the existing condition of the Badger Two Medicine area.
Lewis and Clark NF; Objectives	The objectives in the 1986 Lewis and Clark NF Plan provide guidance for recreation, visual, cultural, water, soils, and wildlife and fish habitats found within the Badger Two Medicine.
Lewis and Clark NF; Forest-wide Standards A-7, A-8, C-1, C-2, C-3, C-4, C-5, N-2, N-3, F-3, H-1, and H-2	The Forest-wide standards for the affected resources within the Badger Two Medicine on the Lewis and Clark Forest focus on protecting the cultural, historic, scenic, and natural resource values within this area.

**Alternatives B, C, and E**

The plan components for the Badger Two Medicine area are the same in all the action alternatives and are noted above in the effects common to all action alternatives section.

**Alternatives D and F**

Alternatives D and F respond to comments received during public scoping asking the Forest to consider an alternative that increases the amounts of primitive recreation opportunities on the forest. In response to these

comments, most of the Badger Two Medicine area (97%) is allocated a primitive ROS setting. The remaining 3% is located adjacent to open roads in several locations near the boundaries of the Badger Two Medicine area and are allocated roaded natural ROS settings. Both primitive and roaded natural ROS settings would allow mechanized uses to continue within the boundary of the Badger Two Medicine area. Establishing the majority of this area as a primitive ROS setting would limit the development of facilities and the type and extent of management activities that would occur within the area.

Despite the primitive ROS class changes, the plan components for the Badger Two Medicine area are the same in alternatives D and F as they are in all the other action alternatives.

## Conclusions

Under all alternatives, the majority of the Badger Two Medicine would continue to provide primitive or semiprimitive nonmotorized recreation opportunity settings. The Badger Two Medicine Traditional Cultural District would remain intact and would continue to acknowledge the significance of this area to the Blackfoot people. The 1895 Agreement with the Indians of the Blackfoot Indian Reservation in Montana would continue to provide the Blackfoot Nation with treaty rights to extract timber, fish, animals, and other resources in the Badger Two Medicine area.

Under alternative A, the Badger Two Medicine would not be identified as an administratively designated area and would continue to be managed according to direction provided in the 1986 Lewis and Clark Forest Plan.

In alternatives B- E, plan components for the Badger Two Medicine would be established and would be the same for all action alternatives.

In alternatives D and F, most of the Badger Two Medicine area (97%) is allocated as a primitive ROS setting. The remaining 3% is located adjacent to open roads in several locations near the boundaries of the Badger Two Medicine area and are allocated roaded natural ROS settings. Both primitive and roaded natural ROS settings would allow mechanized uses to continue within the boundary of the Badger Two Medicine area. Within the primitive ROS settings, the construction of facilities and the management of natural resources within the area would be limited. While this change would affect overall recreation settings, the plan components would remain the same as all the other action alternatives.

By providing the plan components outlined in the action alternatives, the HLC NF would meet the purpose and need of the Plan, ensuring that the Badger Two Medicine is managed for the significant cultural and natural resources that make this area a unique and special place.

### ***3.21.29 Green Timber Basin-Beaver Creek Emphasis Area, affected environment***

The Green Timber Basin-Beaver Creek Emphasis Area is located in the Rocky Mountain Front GA south of Gibson Reservoir along Beaver Creek and Beaver Creek Road extending to the ridgelines directly east and west of Beaver Creek. It is approximately 2,910 acres in size and extends south past Sawmill Flat. This area is entirely within an IRA and the Rocky Mountain Front Conservation Management Area. It is included only in Alternative F.

The Green Timber Basin-Beaver Creek Emphasis Area is notable for both its high diversity and concentration of orchid species, encompassing a unique concentration of ten species of orchids, ranging from rare to common species. Of the five orchid SCC on the HLC NF, substantial populations of two species [(sparrow's eg lady slipper (*Cypripedium passerinum*) and round-leaved orchis (*Amerorchis rotundifolia*)] are present; these species in particular are rare in Montana and exhibit a high fidelity to a very narrow range of ecological tolerance. Two additional orchid species that are SCC for the HLC NF could also be present, in lesser amounts, along with other orchid species that are not SCC. It is uncommon in Montana for conditions to exist that

support large populations of these rare species. This area provides a valuable opportunity for plant enthusiasts to enjoy viewing multiple orchid species.

### ***3.21.30 Green Timber Basin-Beaver Creek Emphasis Area, environmental consequences***

#### **Effects common to all alternatives**

The Green Timber Basin-Beaver Creek Emphasis Area lies within the Rocky Mountain Range GA and is located within both an IRA and a CMA. These designations provide protections for the botanical features of this area by limiting the potential for ground-disturbing activities such as road construction and vegetation management.

The potential for natural disturbance processes such as fire to affect botanical features would also be similar under all alternatives.

In addition, under all alternatives grazing has the potential to impact plants through browsing and trampling. The entire emphasis area lies within the Beaver Creek cattle grazing allotment, which is managed in a rest-rotation grazing system in which one of each five pastures receives rest one out of four years. Use periods in each pasture vary from 10 to 21 days, with allowable forage use levels of 45% on uplands, 60% in riparian areas, and 30% bank alteration. The range infrastructure in this allotment includes drift fences and developed upland water. Several areas with plant occurrences are fenced to exclude cattle, but these would not encompass most of the botanical features. Nevertheless, livestock damage to orchid populations has not been observed recently. The risk of such damage would exist under any alternative. However, the 2021 Land Management Plan as well as the 1986 Forest Plans include plan components designed to limit potential harmful impacts of grazing to all resources.

#### **Effects common to all action alternatives**

There are no effects common to all action alternatives.

#### **Alternative A, no action**

There is currently no direction for the Green Timber Basin-Beaver Creek Emphasis Area in the 1986 Helena NF Plan. However, there is plan direction for IRAs and dispersed recreation areas that would apply to this area of the Forest. Sensitive plant direction for Regional Forester Sensitive Species would continue to be followed under this alternative and the orchid species that overlap with that list would be considered prior to ground disturbing activities. The relatively high density of sensitive species affords this entire area some additional support from ground disturbance.

#### **Alternatives B-E**

Alternatives B-E do not identify this area as an Emphasis Area and no plan components address the botanical diversity of this specific area. FW-PLANT-GDL-01 and FW-VEGT-03 would maintain and enhance SCC, which include at least two of the orchid species in the Emphasis Area. FW-VEGNF-DC-01 and FW-VEGNF-DC-02 maintain natural vegetation communities and would contribute to the maintenance of the desired species in this botanically diverse area, though not specifically focus on this area. It is likely that SCC populations would remain in this area but the high diversity of orchid species, or other desired native species, could decrease over time without plan components that specifically support the assemblage of species as a whole.

#### **Alternative F**

Alternative F is the only alternative with plan components specific to this area. This alternative would also include the forestwide plan components addressed above for alternatives B-E which maintain plant diversity

across the planning area. In addition to the forest-wide plan components, Alternative F includes multiple plan components that would specifically maintain the botanical diversity of this area. This includes consideration for plant species that contribute to the desired diversity, specifically orchid species, during forest activities that are not addressed by other forestwide and SCC plan components.

The Green Timber Basin-Beaver Creek Emphasis Area plan components greatly reduce the risk of impact to desired botanical resources in this area by considering the desired diversity prior to management activities (RM-GB-DC-01, RM-GB-DC-02, RM-GB-GDL-01). This includes reducing the impacts of livestock grazing, recreation activities, prescribed fire, and timber harvest, provided that those uses, and activities do not degrade the unique botanical resources of the area. Though impacts could still occur to the botanical diversity of the area, these plan components would enhance the botanical characteristics of this area over the life of the plan.

#### *Effects from forest plan components associated with:*

##### **Aquatic ecosystems and soil management**

Plan components and management activities for aquatic ecosystems and soil management would affect the management of the Green Timber Basin-Beaver Creek Emphasis Area. The plan components that may have the greatest influence are those associated with RMZs. East of the Continental Divide, RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. Vegetation treatments such as prescribed fire and harvest that may occur in the Emphasis Area would be limited or modified in RMZs but could be modified to meet the diversity maintenance objectives if necessary. These components contribute to maintaining plant diversity of the desired species, orchids, which often overlap with riparian areas and threats to those populations would be reduced. Plan components designed to maintain the function of groundwater dependent systems (e.g., FW-WTR-DC-11, FW-WTR-STD-01 and others) and the physical integrity of shorelines and banks (e.g. FW-FAH-DC-03 and others) would also maintain conditions that support many of the desired species in the area.

##### **Fire and fuels management**

Plan components for fire and fuels management would encourage an appropriate management response to wildfires that may occur within the Green Timber Basin-Beaver Creek Emphasis Area and provide opportunities for natural fire to influence the vegetation condition of these areas. If fire does occur, it may alter the aesthetic quality of the landscape and may also create short term damage to orchid diversity. Long-term, the natural management of fire is expected to maintain habitat diversity over time and support natural plant communities. This would provide opportunities to enhance and maintain plant diversity that depends of frequent fire to sustain populations and reduce risk of catastrophic fire.

##### **Timber and vegetation management**

The vegetation plan components contribute to maintaining native plant communities and diversity across the planning area. FW-PLANT-GDL-01 and FW-VEGT-03 would maintain and enhance species of conservation concern (SCC), which include several of the orchid species in the Emphasis Area. FW-VEGNF-DC-01 and FW-VEGNF-DC-02 maintain natural vegetation communities and would generally support desired native species in this botanically diverse area, though not specifically focus maintaining orchid species on this area. Suitability for timber production is guided by other land designations in this area and the Emphasis Area is entirely within an IRA and the Rocky Mountain Front Conservation Management Area. No plan components specifically support the orchid diversity in this area, unless species are classified as SCC.

##### **Livestock grazing and management**

While livestock grazing itself has the potential to degrade plant communities through factors such as invasive plant spread and damage to riparian areas as described in the *Effects common to all alternatives* section, plan components emphasize the maintenance of resilient native plant communities. These components should help protect the ecological integrity of the area and promote the desired botanical conditions.

**Recreation and scenery management**

Plan components for recreation settings, opportunities, and access along with scenery management would complement the management of the Green Timber Basin-Beaver Creek Emphasis Area and ensure that potential recreation and other activities, such as restoration treatments, would be consistent with its desired conditions.

**Cultural, historic, and tribal resource management**

Plan components related to cultural, historic, and tribal resource would have little to no effect.

**Road access and infrastructure**

Where road or trail maintenance, construction, or reconstruction activities occur they would be guided by road access and infrastructure plan components which include protections for other resources.

**Minerals management**

Lands within the emphasis area would be available for minerals activities when those activities do not degrade the unique botanical resources of the area.

**Cumulative Effects**

Because the Green Timber Basin-Beaver Creek Emphasis Area is relatively small and focused in its purpose and is not immediately adjacent to other non-NFS land, there would be little to no cumulative effect associated with land management plans for other agencies. Other cumulative effects would be like those described in the at-risk plant species section.

**Conclusions**

Alternatives A through E do not identify a specific area designation for this area. Forest activities would continue to be managed through site-specific and case-by-case management decisions on the Forest. Travel plans would provide guidance on where motorized uses could and could not occur. Plant diversity and SCC would be considered at a forest-wide level but not specifically target this highly diverse area.

Alternative F would establish the Green Timber Basin-Beaver Creek Emphasis Area as an administratively designated area on the HLC NF. By providing the plan components in this alternative, the HLC NF would enhance its ability to maintain the desired unique botanical diversity in this area over the life of the plan.

***3.21.31 Grandview Recreation Area, affected environment***

The Grandview Recreation Area is in the western portion of the Big Snowies GA, south of the community of Lewistown, Montana in the Big Snowy Mountain range. This recreation area is approximately 32,296 acres and borders the Crystal Lake Campground complex. Outside of the campground complex, the bulk of the recreation area also overlays a portion of the Big Snowies WSA. The Grandview Recreation Area contains numerous trails that provide exceptional hiking and challenging mountain biking opportunities. These trails lead to prominent features and vistas in the area. There are also popular motorized over-snow areas in the north western portion of the recreation area which provide semiprimitive motorized recreation settings and access into portions of the area in the winter. The Grandview Recreation Area abuts the Big Snowies RWA which is in the eastern portion of the mountain range. This recreation area is only identified in alternative F.

***3.21.32 Grandview Recreation Area, environmental consequences*****Effects common to all alternatives**

The Grandview Recreation Area is only identified in alternative F; therefore, there are no effects common to all alternatives.



## Effects common to all action alternatives

The Grandview Recreation Area is only identified in alternative F; therefore, there are no effects common to all action alternatives.

### Alternative A, no action

There is currently no direction for a recreation area in the Big Snowy Mountains in the 1986 Lewis and Clark NF Plan. However, there is 1986 Forest Plan direction for general recreation, roadless areas, and the Big Snowy Mountains WSA. The following plan components from the existing 1986 Lewis and Clark NF Plan would provide guidance for recreation uses within this area. This information is summarized in Table 215.

**Table 215. Summary of 1986 Lewis and Clark plan components for landscapes in the Grandview Recreation Area**

Plan component	Summary of the 1986 Forest Plan components for landscapes in the Grandview Recreation Area
1986 Lewis and Clark NF Plan, Recreation Objective	These plan components provide for a range of outdoor recreation opportunities that could be developed for visitor use and satisfaction. The Crystal Lake Campground, trails, and trailheads in the Grandview Recreation Area would continue to be popular. Development of additional trails and trailhead facilities may be necessary to accommodate growth in recreation.
1986 Lewis and Clark NF Plan, Roadless Objective	An objective for roadless areas which recognizes over a million acres of roadless on the Lewis and Clark NF. Some of these roadless acres have been identified as WSAs.
1986 Lewis and Clark NF Plan, Geographic Unit Direction, Snowy Mountains, Big Snowies, Pages 4-89 through 4-90	Establishes that the Big Snowies WSA will be managed to protect its wilderness characteristics until Congress acts on the FS's recommendations.

### Alternatives B, C, D, and E

The Grandview Recreation Area was not identified in alternatives B, C, D, or E.

### Alternative F

Public comment received during the comment period of the DEIS revealed strong opinions about the designation of the Big Snowies as an RWA, with strong support both for and against designation for this area. Universally, the public agreed that the primitive character of the area should be protected; however, some asserted that motorized and mechanized means of transportation are suitable in this area while others argued that they are not appropriate and should not be considered suitable. Alternative F balances both strongly held views by proposing a reduced size RWA and creating the Grandview Recreation Area.

The western third of the Big Snowies Mountains is popular with mountain bike users in the summer and snowmobile users in the winter months. In alternative F, the Grandview Recreation Area (GVRA) has been created to provide continued access to mountain bike users and snowmobile recreation uses in the westernmost portion of the mountain range. There are approximately 46.6 miles of nonmotorized trails that would remain open to mechanized means of transportation (including bicycles) and 13,144 acres of motorized-over-snow area that would remain open and available for these uses within the GVRA.

Importantly, the GVRA lies on top of the Big Snowy WSA. Direction for the WSA drives the amount and kind of recreation that can take place in this area (See also Sections 3.22.7 and 3.22.8) and the GVRA would be managed as a primitive recreation area with a primitive ROS setting. Plan components would continue to protect the wilderness characteristics of the area as they existed in 1977.

The majority of the Grandview Recreation Area would be allocated a primitive ROS setting that allows for dispersed nonmotorized recreation uses provided by a network of trails throughout the area. Mechanized means of transportation, including bicycles, would be suitable on existing trails in the primitive ROS setting. In the winter months, portions of the recreation area would provide for existing motorized over-snow uses to continue. These motorized areas would be allocated a semiprimitive motorized ROS setting and managed according to existing travel plans.

Table 216 summarizes the expected effects of each plan component related to the Grandview Recreation Area in alternative F.

**Table 216. Summary of plan components for Grandview Recreation Area (alternative F)**

<b>Plan component</b>	<b>Summary of the plan components for the Grandview Recreation Area</b>
SN-GVRA-DC-01	This DC provides direction for managing the recreation area while enhancing and supporting the primitive characteristics of the area.
SN-GVRA-DC-02	This plan component recognizes that the Crystal Lake Campground Complex provides the primary recreation access into the Grandview Recreation Area.
SN-GVRA-DC-03	This DC provides direction to manage the dispersed nonmotorized recreation experiences in the Grandview Recreation Area.
SN-GVRA-GO-01	This plan component promotes working collaboratively with partners and volunteer to accomplish work within the Grandview Recreation Area.
SN-GVRA-SUIT-01	The Grandview Recreation Area would not be suitable for timber production, although vegetation treatments within the Crystal Lake Campground Complex could occur if consistent with the recreation values of the area.
SN-GVRA-SUIT-02	Mechanized means of transportation (including mountain bikes) would be suitable in the Grandview Recreation Area on FS established roads and trails only. Mechanized means of transportation off of authorized roads and trails would not be suitable.
SN-GVRA-SUIT-03	Motorized over-snow uses would be suitable within winter recreation areas as authorized by the current travel plans.

*Effects from forest plan components associated with:*

**Aquatic ecosystems and soil management**

Plan components related to aquatic ecosystems and soil management resources would have little to no effect on the Grandview Recreation Area. The plan components that may have influence are those associated with Municipal Watersheds (WTR and CWN), but they would generally maintain or enhance the character of Grandview Recreation Area.

**Fire and fuels management**

Plan components for fire and fuels management would encourage an appropriate management response to wildfires that may occur within the Grandview Recreation Area and provide opportunities for natural fire to influence vegetation condition. If fire does occur, it may alter the aesthetic quality of the landscape and may also create short-term barriers to certain recreation uses (for example, dead trees that need to be cleared from trails). However, the potential negative impacts from fire would be ameliorated by fire and fuels plan components that emphasize hazardous fuel mitigation in high-use areas such as the Crystal Lake complex.

**Timber and vegetation management**

The Grandview Recreation Area would not be suitable for timber production, but timber harvest may occur for other resource purposes, in portions of the area outside of the WSA. Due to the ROS settings and other considerations in the area, harvest would likely be very minimal. This activity may complement recreational values of the area if used to improve access, remove hazards, and/or maintain healthy vegetation conditions within the Crystal Lake complex. This activity may displace recreationists for a short period of time. Plan components associated with timber harvest would ensure that all resource protection measures are met.

**Livestock grazing and management**

Livestock grazing could occur in portions of the Grandview Recreation Area. While livestock grazing could influence plant community composition and riparian area condition, plan components emphasize the maintenance of resilient native plant communities as well as desirable riparian area conditions. These components should help guide livestock grazing management and protect the ecological integrity of the area.

**Recreation and scenery management**

Plan components for recreation settings, opportunities, and access along with scenery management would complement the management of the Grandview Recreation Area and ensure that potential recreation and other activities, such as restoration treatments, would be consistent with its desired conditions.

Additionally, the Grandview Recreation Area is located within a portion of the Big Snowies WSA which carries with it plan components that restrict the development of the area. The enabling legislation for the wilderness study areas states that wilderness character will be protected in the WSA. Additionally, the Northern Region supplement to Forest Service Manual 2339 states that “Mountain bikes may be allowed on trails that had established motor-bike use in 1977, or on nonmotorized trails as long as the aggregate amount of mountain bike and motorcycle use maintains the wilderness character of the WSA as it existed in 1977 and the area’s potential for inclusion in the National Wilderness Preservation System.” Therefore, activities and developments with the Grandview Recreation Area would need to meet this direction from the region.

The ROS for the GVRA would remain primitive throughout the year, with exceptions for existing semiprimitive motorized sections in the north and northwest portion of the GA, allowing for authorized motorized over-snow uses in the winter. The Crystal Lake Complex would provide the primary access into the GVRA with potential to develop additional trailheads in the future to the south and west of the GVRA.

**Cultural, historic, and tribal resource management**

Plan components related to cultural, historic, and tribal resource would have little to no effect on the Grandview Recreation Area.

**Road access and infrastructure**

Where trail maintenance, construction, or reconstruction activities occur they would be guided by trail infrastructure plan components which include protections for other resources.

**Minerals management**

Lands within the Grandview Recreation Area would be available for minerals activities.

**Conclusions**

Alternatives A, B, C, D, and E do not identify a specific recreation area designation for this area. Alternative F would establish the Grandview Recreation Area as an administratively designated area on the HLC NF. By providing the plan components in alternative F, the HLC NF would meet the purpose and need of the Plan, ensuring that the Grandview Recreation Area is managed in the long term for its primitive and semiprimitive motorized ROS settings. Mechanized means of transportation would be suitable on existing trails within the recreation area and motorized over-snow uses would continue to be authorized by the current travel plan.

**3.21.33 Cumulative Effects for Administratively Designated Areas**

Land management plans may include recommendations to establish additional or modify existing emphasis areas. Some administrative designations, such as RNAs, may be designated or established concurrent with a plan decision. Once an emphasis area is established by the plan decision, the administrative designation continues until a subsequent decision by the appropriate authority removes, or adds to, the designation. Several emphasis areas across the HLC NF have been administratively designated to maintain their unique character or purpose in the Plan.

Some adjacent lands are subject to their own resource management plans. Land management plans for other federal lands and ownerships (such as the BLM, state, and tribal lands) sometimes identify and manage certain areas for emphasis or administrative designation. These areas generally include direction for maintaining healthy ecosystems and/or managing recreation for both social and ecological benefit. In some cases, these emphasis areas on other federal lands and ownerships correspond with social, cultural, ecological, or recreation management that is taking place on Forest Service lands. The land management plans for adjacent federal, state, and tribal lands would generally be complementary to the 2021 Land Management Plan. The cumulative effects to administratively designated areas from these other resource management plans with the 2021 Land Management Plan are summarized in Table 217.

**Table 217. Summary of cumulative effects to administratively designated areas from other resource management plans**

Resource plan	Description and summary of effects
Blackfeet Nation: Wildland Fire Management Plan, (2018)	The Blackfeet Nation’s Wildland Fire Management Plan is a strategic document that contains operational direction designed to guide a full range of fire management activities on a unit or area supported by land management plans. This would be complementary to the Badger Two Medicine plan components in the 2021 Land Management Plan.
Bureau of Land Management (BLM): Resource Management Plans	BLM lands near the HLC NF are managed by the Butte, Missoula, and Lewistown field offices. These plans have undergone recent revisions. These plans contain components related to wilderness and wild and scenic rivers and would therefore be complementary to the plan components found within the 2021 Land Management Plan. These documents contain special direction for emphasis areas similar to direction found within the 2021 Land Management Plan.
Bureau of Reclamation (BOR): Resource Management Plans, * Canyon Ferry RMP * Canyon Ferry Reservoir Shoreline RMP	These documents describe the measures the BOR will take toward the restoration and management of BOR lands surrounding the Canyon Ferry Reservoir. The direction in these plans is consistent with the plan components in the 2021 Land Management Plan.
City of Helena: * Comprehensive Park Plan *Parks, Recreation, and Open Space Plan	The Parks, Recreation, and Open Space Plan (2010) includes goals and recommendations for open lands associated with the city which are immediately adjacent to NFS lands in the Divide GA. These measures complement the 2021 Land Management Plan components and would be consistent for designated areas in the Divide GA, including the South Hills Recreation Area.
County Growth Policies	These plans are integrated documents that focus on growth management and economic development strategies. These plans generally do not address congressionally designated areas. However, the Fergus County growth plan states that it will not endorse any state or federal monument, wilderness, or wildland designation, without the support of county constituents and commissioner. The 2021 Land Management Plan would not preclude meeting this requirement. Additionally, in the Lewis and Clark County growth plan, policy is given for the Missouri River corridor. This policy is consistent plan components for the Missouri River in the 2021 Land Management Plan.
County Willdfire Protection Plans	The overall effect of these county wildfire protection plans would be to influence where treatments occur to contribute to desired vegetation conditions. Some county wildfire protection plans map and/or define the WUI. These plans do not address administratively designated areas.
Forest Service: Land Management Plans	The forest plans for NFS lands adjacent to the HLC NF include the Lolo, Flathead, Beaverhead-Deerlodge, and Custer-Gallatin NFs. The Flathead NF plan was revised in 2018 and the Custer-Gallatin NF plan is undergoing revision at the time this report was prepared. These plans have identified some level of administratively designated areas such as recommended wilderness, eligible wild and scenic rivers, and research natural areas. These

Resource plan	Description and summary of effects
	plans have plan components which guide the management of these administratively designated areas and are consistent with direction in the 2021 Land Management Plan.
Montana State - DNRC: *Statewide Forest Resource Strategy *Habitat Conservation Plan *Water Plan	These plans guide resource management on state lands. They include many concepts that are complementary to plan components in the 2021 Land Management Plan. These plans do not address designated areas.
Montana State - FWP: Conservation Management Plans *Wildlife Action Plan *Big Horn Sheep Conservation *Elk Management Plan *Fish Management Program	These conservation management plans provide specific direction for the management for wildlife, and fish on Montana State lands. These plans do not address designated areas.
Montana State – State Parks: * Montana State Parks Strategic Plan (2020) *Statewide Comprehensive Outdoor Recreation Plan (SCORP)	The MT State Parks Strategy provides guidance to the state park program and addresses a strategic framework to strengthen the park system in Montana. The SCORP is a Montana statewide comprehensive outdoor recreation plan that serves as a guiding document to promote integrated outdoor recreation management and service provision in a more holistic and effective manner. These plans do not address designated areas.
Montana State - MFAAC: Montana Forest Action Advisory Council (MFAAC) (2020) *Assessment of Forest Condition *Forest Action Plan	These plans aim to take a seamless and coordinated cross-boundary approach to address the pressing concerns of forest health and wildfire risk across all lands in Montana. Recommendations for administratively designated areas, such as recommended wilderness, are consistent with direction in the 2021 Land Management Plan.
Montana Army National Guard: Integrated Natural Resources Plan, Lime Hills Training Area	This natural resource management plan provides direction for the Lime Hills Training Area and was designed to support and accommodate military missions while providing for natural resource stewardship and management. The document focuses on native ecosystems, wildlife, fire, noxious weeds, livestock grazing, cultural resources, and road upgrades and maintenance. This plan does not address scenery. recognizes that the training activities are taking place with the Elkhorns WMU but does not address any other administratively designated areas.
National Park Service (NPS): Glacier National Park, *General Management Plan (1999) *National Park Bear Mgmt. Plan	This management plan for Glacier National Park calls for preserving natural vegetation, landscapes, and disturbance processes. Management of recreation settings is described in 4 zones: visitor service, day use, rustic, and backcountry. Recreation opportunities within these zones is described. This plan is consistent with the 2021 Land Management Plan direction for administratively designated areas. The National Park Bear Mgmt Plan outlines goals and objectives for the management of grizzly bears within the park. This plan does not address designated areas.
Natural Resources Conservation Service (NRCS): Strategic Plans *MT Soil Health Strategy * MT Sage Grouse Initiative Strategy	These plans do not address administratively designated areas.

## 3.22 Congressionally Designated Areas

### 3.22.1 Introduction

The term “designated area” refers to a specific area on a landscape that has been established by statute, regulation, or policy, and once established the designation continues until a subsequent decision by the appropriate authority removes the designation. Designated areas within the Forest have been given permanent designation to maintain their unique special character or purpose.

Land management plans may include recommendations to establish additional or modify existing previously designated areas. Some designations, such as RWAs, may be designated or established concurrent with a plan decision, while others may not.

This section analyzes the effects of the Plan to the areas that are currently designated congressionally by law. The following existing designated areas will be covered in this section:

- Wilderness (WILD)
- Wilderness Study Areas (WSA)
- Continental Divide National Scenic Trail (CDNST)
- Lewis and Clark National Historic Trail (LCNHT)
- Lewis and Clark National Historic Trail Interpretive Center (LCIC)
- Rocky Mountain Front Conservation Management Area (CMA)

### Issues

Most issues for congressionally designated areas were related to plan components and how these plan components supported the existing enabling legislation for the areas. None of the issues brought forward drove alternatives for congressionally designated areas in this analysis. The following is an overview of the issues brought forward:

- Wilderness – No issues.
- Wilderness Study Areas – Some members of the public wished to eliminate WSAs. (See alternatives considered but not studied in detail.)
- CDNST: Several issues related to specific plan components and the CDNST corridor designation. These issues did not drive alternative development.
- Lewis and Clark National Historic Trail: No issues.
- Lewis and Clark National Historic Trail Interpretive Center: No issues.
- Rocky Mountain Front Conservation Management Areas: No issues.

### Measurement indicators

Effects to congressionally designated areas resulting from the alternatives were measured using the following:

- Wilderness: Effects of wilderness plan components.
- Wilderness Study Areas: Effects of WSA, RWA, and Grandview Recreation Area plan components on the WSAs.
- Continental Divide National Scenic Trail: Effects of plan components.
- Lewis and Clark National Historic Trail: Effects of plan components.
- Lewis and Clark National Historic Trail Interpretive Center: Effects of plan components.
- Rocky Mountain Front Conservation Management Areas: Effects of plan components.

## Analysis areas

The geographic scope of the analysis changes by the designated area being analyzed. The following describes the analysis area used for each of the congressionally designated areas and areas proposed for future designation. These analysis areas form the scope for cumulative effects. The temporal scope for effects is the life of the plan (approximately 15 years).

- **Wilderness:** the congressionally determined boundaries of the Bob Marshall, Scapegoat, and Gates of the Mountains wilderness areas, including recent 2014 additions to those wilderness areas.
- **Wilderness Study Areas:** the congressionally determined boundaries of the Big Snowies and Middle Fork Judith WSAs.
- **Continental Divide National Scenic Trail:** The Continental Divide National Scenic Trail corridor on the HLC NF.
- **Lewis and Clark National Historic Trail:** the Lewis and Clark National Historic Trail corridor on the HLC NF.
- **The Lewis and Clark National Historic Trail Interpretive Center:** the congressionally determined boundary of the Lewis and Clark National Historic Trail Interpretive Center as well as the buildings and facilities associated with the interpretive site.
- **Rocky Mountain Front Conservation Management Area:** the congressionally determined boundary of the Rocky Mountain Front Conservation Management Area.

## Changes between draft and final

There were minor wording changes to the plan components for congressionally designated areas between the draft and final EIS. These changes are within the scope of draft EIS analysis.

### 3.22.2 Regulatory framework

**Continental Divide National Scenic Trail Comprehensive Plan amendment (2009):** As directed by the National Trails System Act (Public Law 90-543), this comprehensive plan sets forth direction to guide the development and management along the trail and within the corridor of the Continental Divide National Scenic Trail. The intent of the 2009 Comprehensive Plan is to provide a uniform CDNST program that reflects the purposes of the National Scenic Trail System, and allows for the use and protection of the natural and cultural resources found along the rights-of-way and located route on lands of all jurisdictions. It replaces the 1985 CDNST Comprehensive Plan.

**Final Impact Statement, Middle Fork Judith and Big Snowies Montana Wilderness Study Areas, 1982:** This study was conducted as a requirement of the Montana Wilderness Study Act of 1977. Its purpose was to determine whether these areas were suitable for inclusion as wilderness in the National Wilderness Preservation System.

**Forest Service Manual 2329, Management of Wilderness Study Areas, R1 Supplement (2008):** This manual supplement provides direction for the management of wilderness study areas within the Northern Region of the Forest Service. The direction supports the management of the WSA to maintain wilderness character as it existed at the time of designation (1977), including the management of existing uses and facilities and all new uses, activities, and facilities. It also provides for monitoring of wilderness character and the administrative use of motorized equipment within WSAs.

**Public Law 88-577 (1964):** Establishes a National Wilderness Preservation System for the permanent good of the whole people, and for other purposes. Established both the Bob Marshall and Gates of the Mountains wilderness areas.

**Public Law 90-543 (1968), The National Trails System Act, as amended:** The purpose of the act was "to promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas and historic resources of the Nation." This act authorized three types of trails: 1) National Scenic Trails, 2) National Recreation Trails, and 3) connecting-and-side trails. This act also details the requirements of the trail Comprehensive Plan.

**Public Law 92-395 (1972):** Identifies and designates by law the Scapegoat Wilderness Area on the Lolo, Helena, and Lewis and Clark National Forests.

**Public Law 95-150 (1977) Montana Wilderness Study Act:** This act identified 9 different areas as WSAs within the state of Montana and required the Secretary of Agriculture to conduct studies on these areas to determine their wilderness suitability. Two of the WSAs fall within the HLC NF: Middle Fork Judith and the Big Snowies.

**Public Law 95-625 (1978), National Parks and Recreation Act:** This act established the Continental Divide National Scenic Trail (CDNST) and amended the National Trail System Act of 1968. The act described the nature and purposes of the CDNST. Through this act, Congress directed the Forest Service to prepare and submit a comprehensive plan for the management and use.

**Public Law 90-543 (1978), National Historic Trails:** After 10 years of study, National Historic Trails were added as a 4<sup>th</sup> category to the National Trails System Act. The Lewis and Clark National Historic Trail was included in this legislation.

**Public Law 100-552 (1988) The Lewis and Clark National Historic Trail Interpretive Center:** This law authorized the FS to plan, build, and manage an interpretive facility to "further the public's understanding and provide appropriate interpretation of the scope and accomplishments of the Lewis and Clark Expedition" of 1804-1806.

**Public Law 113-291 (2015) National Defense Authorization Act:** This act includes approximately 195,073 acres of federal lands managed by the FS and approximately 13,087 acres of federal land managed by the BLM. The stated purpose for this conservation management area is to "conserve, protect, and enhance for the benefit and enjoyment of present and future generations the recreational, scenic, historical, cultural, fish, wildlife, roadless, and ecological values of the Conservation Management Area." The law directs the management of motorized vehicles on roads and trails, decommissioning of temporary roads, grazing, vegetation management, noxious weed management, and nonmotorized recreation opportunities. This act also included additions to the Bob Marshall and Scapegoat wilderness areas.

### **3.22.3 Assumptions**

Congressionally designated areas on the HLC NF have all been designated through an act of Congress and the direction for these areas is provided by the associated enabling laws. It is assumed that the HLC NF would manage these areas according to these enabling laws indefinitely or until the current laws are superseded or supplemented by new and/or additional laws.

### **3.22.4 Best available scientific information used**

The Forest used the best available data and scientific information relevant to inform the analysis for the Plan components for designated areas on the forest. Data sources included GISs for mapping, the latest information from the National Visitor Use Data project, information stored in the corporate data base, and site-specific knowledge from forest personnel.



### 3.22.5 Designated wilderness, affected environment

In 1964 Congress passed the Wilderness Act of 1964 (P.L. 88-577) and defined wilderness as a place “in contrast with those areas where man and his own works dominate the landscape... where earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain... an area of undeveloped Federal lands retaining its primeval character and influences, without permanent improvements or human habitation, which is protected and managed to preserve its natural condition and which:

- Generally, appears to have been affected primarily by the forces of nature, with the imprint of man’s work substantially unnoticeable;
- Has outstanding opportunities for solitude or a primitive and unconfined type of recreation;
- Has at least 5,000 acres or is of sufficient size as to make it practicable its preservation and use in an unimpaired condition;
- May contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

The Wilderness Act of 1964 requires the preservation of wilderness character and recognizes multiple values and public benefits found in these areas.

The HLC NF manages three designated wilderness areas: the Bob Marshall, the Scapegoat, and the Gates of the Mountains. Portions of both the Bob Marshall and the Scapegoat lie outside of the planning area on adjacent forests so management of these wilderness areas is shared with surrounding forests. The entire Gates of the Mountains Wilderness lies within the HLC NF and is managed solely by the Forest. These three wilderness areas comprise approximately 20% of the Forest for a total of 564,115 acres. Table 218 describes the three wilderness areas on the HLC NF, the GAs in which they are found, and their total acres.

**Table 218. Designated wilderness areas**

<b>Wilderness</b>	<b>GA</b>	<b>Total wilderness acres within the HLC NF</b>
Gates of the Mountains	Big Belts	28,440
Bob Marshall	Rocky Mountain Range	351,621
Scapegoat	Upper Blackfoot and Rocky Mountain Range	184,054
Total acres of wilderness in the planning area		564,115

#### Bob Marshall Wilderness

The Bob Marshall Wilderness Area totals approximately 1,059,757 acres. Management of this wilderness is shared between the Flathead NF and the HLC NF. The HLC NF portion of the total wilderness area is approximately 351,621 acres. The “Bob”, as it is commonly referred to, straddles the Continental Divide with elevations that range from 4,000 feet along the valley floor to more than 9,000 feet atop the serpentine Continental Divide. It includes the headwaters of the Flathead River to the west and the Sun River to the east. The Bob is noted for excellent hunting, fishing, scenery, and geology. Its vast beauty is highlighted by a huge escarpment known as the “Chinese Wall.” The wall averages 1,000 feet in height and extends 22 miles along the Continental Divide. Topography ranges from rugged precipitous ridge tops to gentle sloping alpine meadows and forested river bottoms.

#### Scapegoat Wilderness

The Scapegoat Wilderness Area is approximately 256,647 acres. Management of this wilderness is shared between the Lolo NF and HLC NF. The HLC NF portion is approximately 184,054 acres. Located just south of and bordering the Bob Marshall Wilderness Area, the Scapegoat also straddles the Continental Divide. Most of this wilderness lies between the elevations of 5,000 feet at the Blackfoot River to 9,400 feet at the top of Red Mountain. Topography of the Scapegoat Wilderness Area ranges from rugged ridge tops, to gently sloping

alpine meadows, to forested slopes and river bottoms. The massive limestone cliffs of the Scapegoat Mountain are an extension of the “Chinese Wall” in the adjacent Bob Marshall Wilderness.

**Gates of the Mountains Wilderness**

The Gates of the Mountains Wilderness is in the east slope of the Continental Divide and, at 28,440 acres, it is one of Montana’s smaller wilderness areas. The Gates of the Mountains Wilderness Area is characterized by massive limestone beds which naturally eroded over millions of years to create the towering cliffs and deep canyons that inspired Captain Meriwether Lewis to call the area “the gates of the Rocky Mountains” during his passage up the Missouri River in 1805. This historical feature is located along the Missouri River adjacent to the wilderness area and is how the wilderness got its name.

**3.22.6 Designated wilderness, environmental consequences**

**Effects common to all alternatives**

Since direction for wilderness management is detailed in law, regulation, and agency policy and in specific management plans, the effects to designated wilderness as a result of the Plan do not differ by alternative. In all alternatives, the acres of the existing Bob Marshall, Scapegoat, and Gates of the Mountains Wilderness Areas would remain the same. There would be no effect to undeveloped or special features and values in any of the alternatives. Significant effects to these wilderness areas are also not expected under any of the alternatives.

A primitive experience would be maintained in the Bob Marshall, Scapegoat, and Gates of the Mountains Wilderness Areas in all alternatives. Natural ecological processes and disturbance would continue to be the primary forces affecting the composition, structure, and patterns of vegetation. Management under all of the alternatives would continue to protect and preserve the wilderness character found within the wilderness areas on the HLC NF.

All alternatives would carry forward the need for wilderness patrols, wilderness rehabilitation of any impacted sites, wilderness education, and wilderness-specific management plans. These activities would be common to all alternatives.

**Effects common to all action alternatives**

The plan components developed for designated wilderness would remain the same in all action alternatives. Table 219 summarizes the expected effects of each plan component related to designated wilderness areas.

**Table 219. Summary of plan components for designated wilderness areas**

Plan component	Summary of plan components for designated wilderness areas
FW-WILD-DC-01	This DC ensures that the key qualities of wilderness character in the Bob Marshall, Scapegoat, and Gates of the Mountains Wilderness Areas contribute to the public purposes for which these wilderness areas were designated.
FW-WILD-DC-02	This DC ensures that the primary forces that affect wilderness character in designated wilderness areas are natural ecological processes and disturbances.
FW-WILD-DC-03	This DC ensures that the large remote areas within the Bob Marshall, Scapegoat, and Gates of the Mountains Wilderness Areas contribute to wildlife species habitat and wildlife movement within and across the Forest.
FW-WILD-DC-04	This DC provides for undisturbed quality habitat for fish, amphibians, and other aquatic-associated species.
FW-WILD-DC-05	This DC ensures that facilities, trails, and signage within designated wilderness areas are minimal, and where present, is constructed of rustic, native, or natural appearing materials to maintain the primitive setting.

Plan component	Summary of plan components for designated wilderness areas
FW-WILD-DC-06	This DC ensures that outfitter and guide services within the Bob Marshall, Scapegoat, and Gates of the Mountains wilderness areas provide support to recreation opportunities and respond to relevant public need.
FW-WILD-DC-07	This DC ensures that the wilderness areas are managed for Class I air quality.
FW-WILD-GO-01	The plan components promote the collaborative efforts between the Lolo, Flathead, and HLC NF in the management of the Bob Marshall Wilderness Complex which includes the Great Bear, Bob Marshall, and Scapegoat wilderness areas.
FW-WILD-GDL-01	This GDL provides direction for the grazing and tethering of recreational stock along water sources within designated wilderness settings.
FW-WILD-GDL-02	This GDL provides management direction for the cave resources in designated wilderness.
FW-WILD-SUIT-01 03; 04	Designated wilderness areas are suitable for existing livestock grazing allotments but are not suitable new or expanded grazing allotments.
FW-WILD-SUIT-02	Designated wilderness areas are not suitable for motorized uses or mechanized means of transportation.
FW-WILD-SUIT-03	Designated wilderness areas are not suitable for timber production or timber harvest.
FW-WILD-SUIT-04	Designated wilderness areas are not suitable for commercial use of nontimber forest products.
FW-WILD-SUIT-05	Designated wilderness areas are not suitable for permanent structures unless they are necessary to meet minimum requirement for the administration of the area.

During scoping, multiple members of the public asked the Forest to consider allowing both recreation aviation (internal airstrips) and mountain biking activities within designated wilderness. Currently, these activities are prohibited by law and are not allowed within the Gates of the Mountains, Scapegoat, and Bob Marshall Wilderness Areas on the HLC NF. The Plan must meet and uphold the current law of the land. Therefore, the Plan cannot make designated wilderness areas suitable for these activities.

In all action alternatives wilderness management plans would exist outside of the Plan. This allows the Forest the ability to provide additional direction for each individual wilderness area. These wilderness management plans would adhere to the plan components of the 2021 Land Management Plan.

*Effects from forest plan components associated with:*

**Aquatic ecosystems and soil management**

Plan components and activities related to watershed, soil, riparian, or aquatic habitat improvements would have little to no effects related to the overall management within designated wilderness areas.

**Fire and fuels management**

Natural, unplanned ignitions would continue the long-term ecological processes in these areas. In limited cases, planned ignitions may also occur within designated wilderness for specific, limited purposes. During and following fire, there could be a temporary loss of vegetation, reduction in water quality due to sedimentation, and increased air pollution. However, these effects are part of the natural ecological processes which are essential to wilderness character in designated wilderness areas. Changes in trail access due to down timber resulting from fire activity may disrupt recreation access patterns in wilderness areas.

**Timber and vegetation management**

Designated wilderness areas are withdrawn from timber production and are not suitable for timber harvest. There would be no effect to designated wilderness from harvest or other vegetation management.

**Livestock grazing and management**

Existing range allotments would continue to be managed as specified within permits in all alternatives. New or expanded livestock grazing allotments would not be allowed.

**Wildlife habitat management**

Activities and plan components related to wildlife habitat management would have little to no effects related to the overall management of designated wilderness areas.

**Cultural, historic, and tribal resource management**

Activities and plan components related to cultural, historic, and tribal resource management would have little to no effects related to the overall management of designated wilderness areas.

**Minerals management**

The Bob Marshall, Scapegoat, and Gates of the Mountains Wilderness Areas have been withdrawn from mineral entry and are not available for new leases or filing of new unpatented mining claims. Mining activities may still occur within designated wilderness areas as long as a proponent has demonstrated they have a valid existing right.

**Alternative A, no action**

In the no-action alternative, designated wilderness areas would continue to be managed under the 1986 Helena and Lewis and Clark Forest Plans. Amendment 1 in both 1986 Forest Plans provides additional direction through the Bob Marshall Complex Recreation Management Plan. This plan provides baseline information for limits of acceptable change for both the Bob Marshall and Scapegoat Wilderness Areas. Future wilderness and other laws may determine where additional wilderness areas could be allocated.

Table 220 describes the plan components in the 1986 Helena and Lewis and Clark Forest Plans that provide direction for designated wilderness areas.

**Table 220. Summary of 1986 Plan components for designated wilderness areas**

Plan component	Summary of 1986 Plan components for designated wilderness areas
1986 Helena NF Plan, Goals 3, Page II/1	Wilderness values are protected and provide benefit to the public in accordance with the Wilderness Act of 1964.
1986 Helena NF Plan, Objectives; Resource Activities/Summaries, Wilderness, Page II/3	This objective ensures that designated wilderness areas will be managed according to the Wilderness Act of 1964 and emphasizes the importance of wildlife habitat for big game species, significant nongame species, and threatened and endangered species. This objective provides direction for grazing allotments within wilderness, and the gathering of recreation use data for maintaining long-term opportunities for wilderness experiences. It also points to fire management direction for the Scapegoat wilderness.
1986 Helena NF Plan, Forest-wide Standard, Recreation 5 and 6, Page II/15	Standard 5 under Recreation emphasizes the “Pack-In, Pack-Out” policy within dispersed recreation areas and wilderness. Standard 6 provides information to users of remote areas and wilderness about proper camping methods to avoid potential conflicts with humans and bears.
1986 Helena NF Plan, Management Areas P-1 and P-2, Pages III/56 through III/72	Management area P-1 provides direction for the portions of the Scapegoat wilderness located in the Helena NF. Management area P-2 provides direction for the Gates of the Mountain wilderness area.
1986 Helena NF Plan, Forest Plan Amendment 1	This amendment adopts the Bob Marshall, Great Bear, and Scapegoat Wildernesses – Recreation Management Plan, which provides overall direction and consistency for management across the Bob Marshall Wilderness Complex.
1986 Lewis and Clark NF Plan Goal 2, Page 2-2	This goal provides for long-term opportunities for wilderness experiences in the Bob Marshall and Scapegoat wilderness areas.

Plan component	Summary of 1986 Plan components for designated wilderness areas
1986 Lewis and Clark NF Plan, Forest-wide Objectives, Wilderness, Page 2-5	This objective ensures that designated wilderness areas would be managed according to the Wilderness Act of 1964 and emphasizes the importance of wildlife habitat for big game species, significant nongame species, and threatened and endangered species. This objective provides direction for grazing allotments within wilderness and provides direction for the use of Limits of Acceptable Change policy for determining the limits on the amounts and types of recreation use that can be tolerated within wilderness areas.
1986 Lewis and Clark NF Plan, Management Area P, Pages 3-72 to 3-84	This management area provides direction for the portions of the Bob Marshall and Scapegoat wilderness areas that are located in the Lewis and Clark NF.
1986 Lewis and Clark NF Plan, Forest Plan Amendment 1	This amendment adopts the Bob Marshall, Great Bear, and Scapegoat Wildernesses – Recreation Management Plan, which provides overall direction and consistency for management across the Bob Marshall Wilderness Complex.

**Alternatives B-F**

See effects common to all action alternatives, above.

**Conclusions**

Since only Congress can establish wilderness areas, the acres and locations of designated wilderness would not vary in any of the alternatives, including alternative A. The action alternatives include plan components that would provide direction for the management of the existing designated wilderness areas on the Forest, including the protection and preservation of existing wilderness character and guidelines for the management of facilities, trails, and outfitter and guide permits within designated wilderness. By providing the plan components outlined in the action alternatives, the HLC NF would meet the purpose and need of the forest plan, ensuring that designated wilderness areas are managed in ways that are ecologically and socially sustainable for present and future generations.

Wilderness management plans would exist outside of the forest plan providing additional wilderness-specific management direction for each individual wilderness area. These wilderness management plans would adhere to the plan components of the 2021 Land Management Plan.

**3.22.7 Wilderness study areas, affected environment**

The HLC NF manages two WSAs: the Big Snowies and the Middle Fork Judith. See Table 221.

**Table 221. Montana wilderness study areas**

WSA	GA	Acres
Middle Fork Judith	Little Belts	82,127
Big Snowies	Snowies	87,968
Total Acres		170,095

The Montana Wilderness Study Act (PL 95-150, S393), passed by Congress in 1977, required the study of certain lands to determine their suitability for designation as Wilderness in accordance with the Wilderness Act of 1964. These lands are referred to as wilderness study areas (WSA). Two of the nine areas identified in this Act are the Middle Fork Judith and Big Snowies WSA’s. The Act includes that “wilderness study areas designated by this Act shall, until Congress determines otherwise, be administered by the Secretary of Agriculture so as to maintain their presently existing wilderness character and potential for inclusion in the National Wilderness Preservation System.”

In accordance with the Act, the Middle Fork Judith and Big Snowies WSA's were studied to determine "their suitability for preservation as wilderness and report these findings to the President." On July 26, 1982, the Forest recommended non wilderness management for both the Middle Fork Judith and the Big Snowies WSAs. This finding was transmitted to the Chief of the Forest Service who then transmitted it to Congress. Congress has not yet acted on this finding. The existing 1986 Lewis and Clark Forest Plan did not identify these areas as recommended wilderness, but the Forest has continued to manage them for their wilderness character and potential for inclusion, awaiting a Congressional decision.

In 1996 the Montana Wilderness Association filed complaint that the "existing wilderness character and potential for inclusion in the National Wilderness Preservation System" had been violated. The Judge enjoined the Forest Service from taking any action that would diminish the wilderness character of a WSA as it existed in 1977, or that diminished the area's potential for inclusion in the National Wilderness Preservation System. He further ordered that the Forest Service should take reasonable steps to restore the wilderness character as it existed in 1977 if the areas' wilderness character or its potential for inclusion in the National Wilderness Preservation System has been diminished since 1977.

The Forest completed travel management plans (for summer and winter wheeled vehicles). The 2002 Travel Management Plan, as modified by a 2004 Winter Recreation Agreement and summer use settlement agreement, effectively crafted a settlement to preserve the wilderness character of the WSAs.

In March 2007, a settlement agreement regarding the 1996 complaint was reached. The agreement states that travel management decisions shall address summer and winter use of trail and off trail areas within each WSA, based upon applicable law and policy including policy set forth in Forest Service Manual 2329; and that pending completion of the travel management plans for the WSAs, the Forest Service shall manage the WSAs in accordance with applicable law and policy including but not limited to the Montana Wilderness Study Act PL 95-150 (1977) and Forest Service Manual 2329.

As part of the 2007 settlement a Northern Region supplement to the Forest Service Manual 2329 was published in 2008 which provided clarification for management of WSA's. The R1 Manual Supplement includes guidance for management to maintain wilderness character, management of existing uses, and new uses such as mountain bikes. The 2002 Forest Travel Plan did not consider Forest Service Manual direction on management of WSAs for new uses such as mountain bikes.

This analysis will address the direction for activities within WSA found in the Northern Region supplement to FSM 2329. There were no restrictions to mechanized transport or mountain biking in WSA areas in 1977. However, under the Northern Region supplement to Forest Service Manual 2339, "Mountain bikes may be allowed on trails that had established motor-bike use in 1977, or on nonmotorized trails as long as the aggregate amount of mountain bike and motorcycle use maintains the wilderness character of the WSA as it existed in 1977 and the area's potential for inclusion in the National Wilderness Preservation System."

### ***3.22.8 Wilderness study areas, environmental consequences***

#### **Effects common to all alternatives**

The WSAs on the HLC NF are governed by the terms of the Montana Wilderness Study Act (Public Law 95-150) which are designed to protect and retain wilderness characteristics until Congress makes a final decision about these areas. The Big Snowies and the Middle Fork Judith WSAs would be managed and regulated according to the direction provided in this law, as well as the Northern Region supplement to FSM 2329.

In all alternatives, the acres of the Big Snowies and Middle Fork Judith WSAs would remain the same. There would be no effect to the existing undeveloped values or special features of these WSAs in any of the

alternatives. All the alternatives would continue to protect and preserve the wilderness characteristics found within the WSAs on the HLC NF.

### Effects common to all action alternatives

The plan components for WSAs would remain the same in all action alternatives. See Table 222.

**Table 222. Summary of plan components for WSAs**

<b>Plan component</b>	<b>Summary of the plan components for WSAs</b>
FW-WSA-DC-01	This DC ensures an environment in WSAs where the primary forces affecting ecological processes in the environments such as natural succession, wildfire, avalanches, and insects and disease.
FW-WSA-DC-02	This DC ensures that WSAs provide opportunities for primitive recreation, while allowing for recreation uses established prior to the 1977 Montana Wilderness Study Act and other uses that do not diminish the wilderness character as it existed in 1977.
FW-WSA-SUIT-01; 02; 06	These plan components provide direction for timber production, timber harvesting, new commercial communication sites, new utility corridors, and developed recreation sites and facilities within WSAs. None of these management actions are suitable within WSAs.
FW-WSA-SUIT-03	This plan component states that restoration activities, such as management ignited fire and active weed management, are suitable within WSAs, so long as they protect and/or enhance the wilderness character of these areas.
FW-WSA-SUIT-04	This component ensures that the use of motorized equipment, such as chain saws, is suitable in WSAs to achieve restoration activities and administrative work.
FW-WSA-SUIT-05	This plan component provides direction for road construction and reconstruction within WSAs.
FW-WSA-SUIT-07	This plan component allows for existing livestock grazing allotments but prohibits new or expanded livestock grazing allotments within WSAs.

### *Effects from forest plan components associated with:*

#### **Aquatic ecosystems and soil management**

Plan components and management activities for aquatic ecosystems and soil management would have little effect related to WSAs. The plan components that may have the greatest influence are those associated with RMZs. East of the Continental Divide, RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. All the WSAs are east of the Continental Divide.

Little to no active management would occur in WSAs. However, restoration treatments such as prescribed fire that could occur may be limited or modified within RMZs. The area on which these components apply is greater with the action alternatives than with the no-action alternative on landscapes east of the Continental Divide; however, the effect would be minor and insubstantial with regards to the wilderness character of WSAs.

#### **Fire and fuels management**

Plan components for fire and fuels management would encourage an appropriate management response to wildfires that may occur within WSAs and provide opportunities for natural fire to promote and/or enhance the wilderness character of these areas. Fire and fuels management plan components also specify the use of minimum impact strategies and tactics to manage wildland fire within WSAs, which would further protect wilderness characteristics.

**Timber and vegetation management**

There would be no effect to WSAs from plan components related to timber harvest because no timber harvest would be allowed in these areas. Plan components related to desired vegetation conditions could influence whether restoration treatments (such as management-ignited fires) are conducted in WSAs and help define the objectives for those treatments. Vegetation management activities such as planting of whitebark pine could also be allowed. Vegetation plan components would help promote and/or enhance the wilderness character of these areas.

**Livestock grazing and management**

The plan components for the action alternatives do not allow for new or expanded livestock grazing allotments to occur within WSAs; however, existing allotments may be retained. Therefore, the plan components that guide livestock grazing and management would influence these areas. While livestock grazing itself has the potential to degrade plant communities through factors such as invasive plant spread and damage to riparian areas, plan components emphasize the maintenance of resilient native plant communities as well as desirable riparian area conditions. These components should help protect the wilderness character of WSAs, to a greater degree with the action alternatives as compared to the no-action alternative.

**Wildlife habitat management**

Plan components related to wildlife habitat management would have little to no effect on WSAs.

**Recreation and scenery management**

The plan components for recreation settings, opportunities, and access along with scenery management would support the management of WSAs for their wilderness characteristics. In the alternatives B, C, and D, both WSAs have a primitive ROS setting and a very high SIO. In the Big Snowies WSA in alternatives A, E, and F, the WSA would have a desired primitive ROS setting with some winter semiprimitive motorized ROS setting in those areas that allow for motorized over-snow uses. These settings would ensure that potential recreation and other activities, such as restoration, would be consistent with WSA desired conditions and meet the intent of the managing the wilderness character of the WSAs as they existed in 1977 and maintaining the areas potential for inclusion in the National Wilderenss Preservation Act.

**Cultural, historic, and tribal resource management**

Plan components related to cultural, historic, and tribal resource would have little to no effect on WSAs. The protection of these resources would be consistent with maintaining the wilderness character of these areas.

**Road access and infrastructure**

Plan components related to road access and infrastructure would have little to no effect on WSAs, because these areas would not be suitable for road construction or reconstruction. However, road reconstruction or rerouting for the purpose of eliminating impacts to natural or cultural resources is allowed, provided the abandoned routs are fully rehabilitated (FW-WSA-SUIT-05); plan components for infrastructure would help ensure this work is done in a manner that protects hydrological resources.

**Minerals management**

WSAs are not compatible for mineral leasing and salable minerals, but still open to locatable mineral prospecting, exploration and development.

**Alternative A, no action**

In alternative A, the Big Snowies and the Middle Fork Judith WSAs would continue to be managed under the 1986 Lewis and Clark Forest Plan, direction found in Public Law 95-150, and the Northern Region Supplement to Forest Service Manual 2329. Future wilderness laws and/or other laws may determine the fate of these WSAs. Table 223 describes the plan components in the 1986 Lewis and Clark Forest Plan that provide direction for the Big Snowies and Middle Fork Judith WSAs.



**Table 223. Summary of 1986 Plan components for WSAs (alternative A)**

Plan component	Summary of 1986 Plan components for WSAs
1986 Lewis and Clark NF Plan, Objectives – Roadless Areas, Page 2-5	An objective for roadless areas which recognizes over a million acres of roadless on the Lewis and Clark NF. Some of these roadless acres have been identified as WSAs.
1986 Lewis and Clark NF Plan, Geographic Unit Direction, Little Belt Mountains, Middle Fork Judith Pages 4-69 through 4-70	Establishes that the Middle Fork Judith WSA will be managed to protect its wilderness characteristics until Congress acts on the FS's recommendations.
1986 Lewis and Clark NF Plan, Geographic Unit Direction, Snowy Mountains, Big Snowies, Pages 4-89 through 4-90	Establishes that the Big Snowies WSA will be managed to protect its wilderness characteristics until Congress acts on the FS's recommendations.

### Alternative B

The entire Big Snowies WSA would be identified as a RWA in alternative B. Both the plan components for RWAs and the plan components for WSAs would apply to the Big Snowies WSA in this alternative.

Motorized and mechanized means of transportation (including bicycles) would be unsuitable within the Big Snowies RWA in alternative B. This would create a need for reductions in motorized and mechanized means of transportation to meet the suitability requirements in the Plan. These changes in suitability may be reflected in a future site-specific decision and would reduce the amount of motorized recreation (primarily over-snow uses) and mechanized means of transportation (mountain bikes) access in the Big Snowies WSA. See appendix K for more details on the potential future direct effects of changes to recreation access resulting from changes to suitability within the Big Snowies WSAs.

The Middle Fork Judith WSA would not be identified as an RWA in alternatives B. The plan components for WSAs, as described in effects to all action alternatives, above, would apply to the Middle Fork Judith WSA.

### Alternative C

The entire Big Snowies WSA would be identified as an RWA in alternative C and both the plan components for RWA and the plan components for WSAs would apply to the Big Snowies WSA in this alternative.

In alternative C, motorized and mechanized means of transportation would be suitable within the Big Snowies RWA, so long as these uses do not affect the wilderness character within the WSA, as it existed prior to 1977. The Northern Region supplement to Forest Service Manual 2339 states that “Mountain bikes may be allowed on trails that had established motor-bike use in 1977, or on nonmotorized trails as long as the aggregate amount of mountain bike and motorcycle use maintains the wilderness character of the WSA as it existed in 1977 and the area’s potential for inclusion in the National Wilderness Preservation System.”

The Middle Fork Judith WSA would not be identified as a RWA in alternatives C. The plan components for WSAs, as described in effects to all action alternatives, above, would apply to the Middle Fork Judith WSA.

### Alternative D

Like alternatives B and C above, the entire Big Snowies WSA would be identified as an RWA in alternative D. In addition, approximately  $\frac{3}{4}$  of the Middle Fork Judith WSA would be identified as an RWAs. Both the plan components for RWAs and the plan components for WSAs would apply to the Big Snowies and Middle Fork Judith WSAs in this alternative.

Motorized and mechanized means of transportation (including bicycles) would be unsuitable within the Big Snowies and Middle Fork Judith RWAs in alternative D. This would create a need for reductions in motorized and mechanized means of transportation to meet the suitability requirements in the Plan. These changes in

suitability may be reflected in a future site-specific decision and would reduce the amount of motorized recreation (primarily over-snow uses) and mechanized means of transportation (mountain bikes) access in the Big Snowies and Middle Fork Judith WSAs. See appendix K for more details on the potential future direct effects of changes to recreation access resulting from changes to suitability within the WSAs.

Approximately  $\frac{3}{4}$  of the Middle Fork Judith WSA was also identified as an RWA in alternative D. Therefore, the plan components for RWAs would also apply to those portions of the Middle Fork Judith WSA identified as an RWA. The portions of the Middle Fork Judith WSA outside of the RWA boundary would follow the plan components for WSAs, identified in effects to all action alternatives, above.

### Alternative E

In alternative E, neither the Big Snowies nor the Middle Fork Judith WSAs would be identified as RWAs. The plan components for WSAs, identified in effects to all action alternatives, above, would apply.

### Alternative F

The eastern portion of the Big Snowies WSA (approximately 66,894 acres) would be identified as an RWA in alternative F. For this area, both the plan components for RWAs and the plan components for WSAs would apply.

Motorized and mechanized means of transportation (including bicycles) would be unsuitable within the Big Snowies RWA in alternative F. This would create a need for reductions in motorized and mechanized means of transportation to meet the suitability requirements in the Plan. These changes in suitability may be reflected in a future site-specific decision and would reduce the amount of motorized recreation (primarily over-snow uses) and mechanized means of transportation (mountain bikes) access in the Big Snowies WSA. See appendix K for more details on the potential future direct effects of changes to recreation access resulting from changes to suitability within the Big Snowies WSAs.

The western portion of the Big Snowies WSA would be located within an area identified as the Grandview Recreation Area in alternative F. This recreation area would be approximately 32,296 acres and border the Crystal Lake Campground complex. The Grandview Recreation Area would also abut the Big Snowies RWA in the eastern portion of the mountain range. Plan components for both the Grandview Recreation Area and the WSA would apply for the recreation area. Please see section 3.21.31 and 3.21.32 for more information regarding the Grandview Recreation Area.

Both motorized and mechanized means of transportation would be suitable within the Grandview Recreation Area, outside of the RWA in the western portion of the WSA, so long as these uses do not affect the wilderness character within the WSA, as it existed prior to 1977. Motorized over-snow uses would continue to be authorized in the WSA in this alternative and mechanized means of transportation (mountain bikes) would be allowed so long as the aggregate amount of mountain bike use maintains the wilderness character of the WSA as it existed in 1977. These recreation uses would be monitored in alternative F to ensure the area's potential for inclusion in the National Wilderness Preservation System.

The Middle Fork Judith WSA would not be identified as an RWA in alternatives F. The plan components for WSAs, as described in effects to all action alternatives, above, would apply to the Middle Fork Judith WSA.

### Conclusions

Since WSAs are congressionally designated, the acres and locations of the Big Snowies and Middle Fork Judith WSAs would not vary in any of the alternatives, including alternative A. In alternative A, the Big Snowies and the Middle Fork Judith WSAs would continue to be managed under the 1986 Lewis and Clark Forest Plan, direction found in Public Law 95-150, and Northern Region supplement to Forest Service Manual 2339.

The action alternatives (alternatives B-F) include plan components that would provide direction for the management of the WSAs on the Forest including the protection and preservation of the wilderness character (as they existed in 1977) and guidelines for the management of facilities, utilities, trails, and outfitter and guide permits within WSAs. By providing the plan components outlined in the action alternatives, the HLC NF meets the purpose and need of the forest plan, ensuring that WSAs are managed in ways that are ecologically and socially sustainable for present and future generations.

In alternatives B, C, and D, the entire Big Snowies WSA would be identified as an RWA. In these three alternatives, activities/management in the Big Snowies WSA would be subject to the more restrictive plan components for RWAs.

Similarly, in alternative D, portions of the Middle Fork Judith WSA would be identified as an RWA. The more restrictive plan components for RWAs would apply to those acres of the Middle Fork Judith that have been identified as such. The acres of the Middle Fork Judith WSA that are not identified as RWA would follow the plan components developed for WSAs.

No RWAs were identified in alternative E so both the Big Snowies and the Middle Fork Judith WSAs would follow the plan components for WSAs in this alternative.

In alternative F, the Middle Fork Judith WSA would not be identified as an RWA and would follow the plan components for WSA noted above. However, management of the Big Snowies WSA would vary. The eastern portion of the Big Snowies WSA would be identified as an RWA and would follow the plan components for both RWAs and WSAs. The western portion of the WSA would be identified as the Grandview Recreation Area and would follow the plan components identified for this recreation area as well as for the WSA. All these plan components (WSAs, RWAs, and Grandview Recreation Area) would protect the wilderness character of this area as it existed before 1977 and would ensure the area's potential for inclusion in the National Wilderness Preservation System.

### 3.22.9 Continental Divide National Scenic Trail, affected environment

The Continental Divide National Scenic Trail (CDNST) is a nationally recognized scenic route located along or near the Continental Divide of the Rocky Mountains. The CDNST was established by the National Parks and Recreation Act of 1978 (Public Law 95-625), which amended the National Trails System Act of 1968. Additionally, the 2009 Continental Divide National Scenic Trail Comprehensive Plan amendment sets forth direction to guide the development and management along the trail and within the corridor of the CDNST. The nature and purposes of the trail are to provide for high-quality scenic primitive hiking and horseback riding opportunities and to conserve the natural, historic, and cultural resources along the trail corridor.

The CDNST and trail corridor crosses portions of 25 National Forests, 3 National Parks, 4 Bureau of Land Management Districts, and various private lands in the states of Montana, Idaho, Wyoming, Colorado, and New Mexico. The total distance from the Canada-United States border on the north and the United States-Mexico border on the south is approximately 3,100 miles. Of this distance, approximately 750 miles of the trail are in Montana and 273 of those miles are in the HLC NF. An estimated 65 miles of the trail is located within the Upper Blackfoot GA, approximately 68 miles are located within the Divide GA, and approximately 140 miles are located within the Rocky Mountain GA (Table 224).

In addition to the trail tread itself, the HLC NF also manages the trail corridor which includes the NFS lands ½ mile to either side of the trail tread. This broad corridor protects the natural, scenic, historic, and cultural features along the trail.

**Table 224. Continental Divide National Scenic Trail segments**

Trail Name	Trail #	GA	County	Miles
Continental Divide	337	Divide	Lewis and Clark	68

Trail Name	Trail #	GA	County	Miles
Two-Med-Heart Butte	101	Rocky Mountain Range	Pondera	4
North Fork Badger	103	Rocky Mountain Range	Pondera	1
North Fork Sun	110	Rocky Mountain Range	Teton	4
Rock Creek	111	Rocky Mountain Range	Lewis and Clark	12
Open Fork	116	Rocky Mountain Range	Lewis and Clark	6
North Fork Red Shale	130	Rocky Mountain Range	Lewis and Clark	7
Summit Campground Cutoff	133	Rocky Mountain Range	Glacier	2
Elk Calf Mountain	137	Rocky Mountain Range	Glacier and Pondera	10
Lee Creek-Sidney Creek	141	Rocky Mountain Range	Pondera	5
Kip Creek	142	Rocky Mountain Range	Pondera	3
Elbow Creek	145	Rocky Mountain Range	Pondera	4
Muskrat Creek	147	Rocky Mountain Range	Pondera	7
North Wall	174	Rocky Mountain Range	Lewis and Clark	11
Wall Trail	175	Rocky Mountain Range	Lewis and Clark	6
My Lake	194	Rocky Mountain Range	Lewis and Clark	4
South Fork Sun	202	Rocky Mountain Range	Lewis and Clark	13
West Fork Sun	203	Rocky Mountain Range	Lewis and Clark	16
Dearborn River	206	Rocky Mountain Range	Lewis and Clark	9
Blacktail-Landers Fork	207	Rocky Mountain Range	Lewis and Clark	3
Straight Creek	212	Rocky Mountain Range	Lewis and Clark	10
Elbow Pass	248	Rocky Mountain Range	Lewis and Clark	3
Continental Divide National Scenic Trail	440	Upper Blackfoot	Lewis and Clark	65
Total				273

### *3.22.10 Continental Divide National Scenic Trail, environmental consequences*

#### Effects common to all alternatives

In all alternatives, the HLC NF would provide for the nature and purposes of the CDNST, in accordance with the programmatic requirements of the National Trails System Act, as amended, and the 2009 CDNST Comprehensive Plan. Additionally, all alternatives carry forward the need for rehabilitation of any impacted sites along the trail, education and interpretation along the trail, and implementation of CDNST management plans.

#### Effects common to all action alternatives

The portions of the CDNST and trail corridor on the Rocky Mountain Range GA are located within the Bob Marshall and the Scapegoat Wilderness areas. Natural ecological processes and disturbance would continue to be the primary forces affecting the composition, structure, and patterns of vegetation in these areas. The primitive recreation opportunity setting with wilderness would ensure the trail is managed for a primitive experience.

The remainder of the CDNST and trail corridor is located within the Divide and Upper Blackfoot GAs. In these GAs, the trail corridor passes through undeveloped areas as well as areas where timber management, road building, and mining have historically been present.

Plan components developed for the CDNST and trail corridor remain the same in all action alternatives. Table 225 summarizes the expected effects of each of these plan components.

**Table 225. Summary of plan components for the CDNST and trail corridor**

<b>Plan component</b>	<b>Summary of plan components for the CDNST and trail corridor</b>
FW-CDNST-DC-01	This DC ensures that the Continental Divide National Scenic Trail and corridor provides high-quality primitive and/or semiprimitive hiking and horseback riding opportunities and other compatible nonmotorized activities, in a highly scenic setting along the Continental Divide. The significant scenic, natural, historic, and cultural resources along the trail corridor are conserved. The trail provides users with expansive views of the surrounding landscapes.
FW-CDNST-DC-02	This DC ensures that foreground views, up to ½ mile either side of the trail, are natural-appearing and generally appear unaltered by human activities. Middleground and background views consider the effects on scenic integrity and trail experience as seen from trail segments.
FW-CDNST-DC-03	This DC ensures that the trail corridor provides primitive and/or semiprimitive nonmotorized ROS settings. The trail may pass through more developed settings to provide a continuous route.
FW-CDNST-DC-04	This DC ensures a variety of access points along the trail.
FW-CDNST-DC-05	User conflicts along the trail corridor are managed so that they are infrequent.
FW-CDNST-DC-06	This DC ensures that the trail is maintained, signed, and passable and that alternate routes are established when portions of the trail are temporarily closed due to natural events or for public safety purposes.
FW-CDNST-DC-07	Interpretation along the trail enhances visitor experiences and increases awareness of the cultural and historic features along the trail.
FW-CDNST-GO-01	This component promotes working collaboratively with partners, volunteers, communities, and federal, tribal, and state land and wildlife managers to conserve the valuable natural, wild land, scenic, historic and cultural resources along the trail and within the trail corridor.
FW-CDNST-OBJ-01	This objective works to maintain the entire length of the trail and to reroute selected portions in order to improve scenic viewing opportunities, reconstruct trail to standard, and/or provide nonmotorized experiences.
FW-CDNST-STD-01; 02	These STDs prohibit surface occupancy for oil and gas or geothermal energy leasing activities and common variety mineral extraction within the Continental Divide National Scenic Trail corridor.
FW-CDNST-STD-03	This STD prohibits new motorized recreation events on the trail, thereby supporting the primitive and semiprimitive settings within the trail corridor but does provide for exceptions in sections that are currently along motorized routes.
FW-CDNST-GDL-01	This guideline provides direction for the retention or promotion of the primitive and/or semiprimitive nonmotorized ROS settings within the trail corridor.
FW-CDNST-GDL-02; 03; and 06	These GDLs protect and enhance the scenic quality of the Continental Divide National Scenic Trail and trail corridor by being consistent or making progress toward achieving the SIOs of high and/or very high within the foreground of the trail (up to 1/2 mile either side of the trail within the trail corridor).
FW-CDNST-GDL-04	This GDL ensures that the Continental Divide National Scenic Trail is not located on routes open to motorized recreation uses.
FW-CDNST-GDL-05; 07	These GDLs promote natural-appearing settings by providing direction for minimal facility development along the trail and within the trail corridor and by ensuring that linear utilities and rights-of-way are limited to a single crossing of the trail unless additional crossings are documented as the only prudent and feasible alternative.
FW-CDNST-GDL-08	This GDL provides direction for the construction of new or temporary roads or motorized trails across or adjacent to the trail.

Plan component	Summary of plan components for the CDNST and trail corridor
FW-CDNST-GDL-09	This GDL restricts the use of the trail as a landing or temporary road during vegetative management activities and limits the hauling or skidding of logs along or across the Continental Divide National Scenic Trail.
FW-CDNST-GDL-10	This GDL ensures that minimum fire suppression tactics are used with unplanned fires in the foreground (up to ½ mile either side) of the trail.

*Effects from forest plan components associated with:*

**Aquatic ecosystems and soil management**

Plan components and activities related to aquatic ecosystems and soil management would generally have little effect to the CDNST and trail corridor, because the trail most often follows ridgetops rather than stream bottoms. Where the trail corridor does cross or parallel streams, plan components related to RMZs would help maintain the scenic quality of those areas, and therefore complement the management of the trail.

East of the Continental Divide (the majority of the HLC NF), RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. West of the Continental Divide, the area influenced by riparian plan components is the same across all alternatives because RMZs would be defined the same way as riparian habitat conservation zones are in the no-action alternative.

**Fire and fuels management**

Plan components for fire and fuels management would encourage an appropriate management response to wildfires that may occur near the CDNST and within the corridor and provide opportunities for natural fire to alter the vegetation condition of the landscape. When fire does occur, whether natural or management-ignited, it could change the scenery visible from the trail, including charred vegetation in the short term as well as regrowth in the longer term. Fire on the landscape would generally complement the scenic quality objectives for the trail and trail corridor. Plan components are in place to ensure that minimum impact suppression tactics or other tactics appropriate for the protection of the trail values are used.

**Timber and vegetation management**

Many stretches of the trail corridor lie within designated wilderness, where timber harvest is prohibited. Other stretches are in IRAs, where timber harvest is largely constrained. However, some stretches of this trail are in areas where harvest could occur, including both areas that are suitable for timber production and those unsuitable for timber production where harvest can occur for other purposes. Alternative D would have the least amount of overlap with the trail corridor in both lands suitable for timber production and unsuitable lands where harvest could occur for other purposes, largely as a function of RWAs. Alternative A has the most overlap of lands suitable for timber production, while alternative E has the most overlap of unsuitable lands where harvest may occur for other purposes.

Where harvest does occur, it could impact the scenic values visible from the trail, including more open vegetation and stumps, as well as soil disturbance in the short term. Conversely, harvest could be used to improve the scenic quality by creating vistas, mimic vegetation structures that would be created by natural disturbance and promote healthy vegetation. Vegetation plan components would help define the objectives for treatments that may occur near the trail. In addition to harvest, plan components would allow for other vegetation treatments such as tree planting and weed spraying, which could further enhance the scenic quality of the trail and trail corridor.

While harvest could have the potential to degrade the scenic quality along the trail and within the trail corridor, such effects are unlikely to occur because of plan components to maintain a high or very high SIO within ½ mile of either side of the trail (FW-CDNST-GDL-02, 03). Guidelines also limit harvest-related activities such as temporary roads, skidding, hauling, and log landings (FW-CDNST-GDL-08, 09, 10).

### **Livestock grazing and management**

Livestock grazing allotments could occur along the trail or within the trail corridor; therefore, plan components for livestock grazing would have an effect. Evidence of grazing, including cows, cow patties, grazed vegetation, and weeds could occur. However, plan components for livestock grazing emphasize the maintenance of resilient native plant communities as well as desirable riparian area conditions. These components should help protect the scenic quality of the trail, to a greater degree with the action alternatives as compared to the no-action alternative.

### **Recreation and scenery management**

Where possible, the CDNST is located within primitive and semiprimitive nonmotorized ROS settings. Much of the route across the forest is within the Bob Marshall Wilderness Complex. However, there are areas where the CDNST traverses intermittently through more developed ROS settings on the HLC NF to provide a continuous route across the forest.

Recreation and scenery management plan components would complement the management of the CDNST and trail corridor by specifying ROS settings (primitive and semiprimitive nonmotorized) and scenic quality objectives (high or very high) that are consistent with maintaining or moving toward the desired conditions of the trail and trail corridor, along with providing the facilities and infrastructure (such as signs) needed for the public to access and use the trail system.

### **Cultural, historic, and tribal resource management**

Plan components for cultural, historic, and tribal resources would complement the management of the CDNST and within the trail corridor.

### **Road access and infrastructure**

Plan components for the CDNST include objectives and guidelines that encourage nonmotorized use. To the extent that the trail itself or motorized routes in proximity to the trail may be maintained, reconstructed, or relocated, the plan components for access and infrastructure would ensure that this work is done in a manner that has minimal impacts to other resources. These components would therefore complement the management of the trail.

### **Minerals management**

Plan components for minerals management would have little to no effect on the CDNST because components are in place that preclude surface occupancy and mineral material extraction within the trail corridor.

### **Alternative A, no action**

Under alternative A, the CDNST and trail corridor would continue to be managed under direction provided in the 1986 Helena and Lewis and Clark Forest Plans, the programmatic requirements of the National Trails System Act, as amended, the 2009 CDNST Comprehensive Plan, and FS Handbook direction.

Table 226 describes the plan components in the 1986 plans that provide direction for the CDNST.

**Table 226. Summary of 1986 Plan components for the CDNST**

<b>Plan component</b>	<b>Summary of the 1986 Plan components for the CDNST</b>
1986 Helena NF Plan Forest-wide Standard, Recreation 4, Page II/15	This standard defers to the direction provided in the 2009 Comprehensive Management Plan for the Continental Divide National Scenic Trail.
1986 Helena NF Plan Forest-wide Standard, Visual 1, Page II/15	The visual quality along the Continental Divide National Scenic trail will be the same as those identified for the management areas through which the trail passes.

Plan component	Summary of the 1986 Plan components for the CDNST
1986 Helena NF Plan Management Areas H-1 and H-2, Pages III/17 and III/20	Mentions Continental Divide National Scenic Trail but does not provide any trail-specific direction.
1986 Lewis and Clark NF Plan, Forest-wide Management Standard L-3 (1) and (2), Page 2-65	(1) These standards refer to the management direction along the trail provided in the National Trails System Act. (2) The management of the trail will be done in coordination with the Glacier National Park, especially in regard to developments along Marias Pass.
Lewis and Clark NF Management Area P, Page 3-83	This management area provides direction for the Continental Divide National Scenic Trail in the Bob Marshall and Scapegoat wilderness areas. The specific route locations were identified once the 2009 Comprehensive Management Plan was developed. Individual inquiries regarding the trail would be handled on a case-by-case basis and an assigned trail coordinator would be responsible for any inquiries.

## Alternatives B- F

See Effects common to all action alternatives, above. The CDNST corridor map may be found in appendix A.

## Conclusions

In alternative A, the no-action alternative, the CDNST would continue to be managed as per guidance found in the 1986 Helena and Lewis and Clark NF Plans, the Continental Divide National Scenic Trail Act of 1978, the 2009 Continental Divide National Scenic Trail Comprehensive Plan, and FS Handbook direction. In the 1986 Helena NF Plan, the visual quality along the trail would be the same as the visual quality identified for the management areas through which the trail passes.

Alternatives B-F would provide for the nature and purposes of the CDNST by providing specific plan components for the trail and trail corridor. These plan components would remain the same in all action alternatives and are compatible with the programmatic requirements of the National Trails System Act, as amended, and the 2009 Continental Divide National Scenic Trail Comprehensive Plan. No updates to the 2009 Continental Divide National Scenic Trail Comprehensive Plan would be needed as a result of the 2021 Land Management Plan.

All alternatives would also carry forward the need for rehabilitation of any impacted sites along the trail, education and interpretation along the trail, and the implementation of CDNST management plans.

The scenic quality along the CDNST would be consistent with or make progress toward achieving the SIOs of high and/or very high within the foreground of the trail (up to 1/2 mile either side of the trail). The CDNST corridor map may be found in appendix A.

### 3.22.11 Lewis and Clark National Historic Trail, affected environment

The Lewis and Clark National Historic Trail “commemorates the 1804-1806 ‘Corps of Discovery’ expedition, an epic journey of exploration of the Louisiana Purchase and beyond. The trail travel through 11 states and is approximately 3,700 miles long, extending from Wood River, Illinois, to the mouth of the Columbia River in Oregon encompassing many tribal, federal, state, county, and local jurisdictions, as well as private lands.” (Belote, Cooper, & Daniels, 2017)

Approximately 12.9 miles of the 3,700-mile-long trail are in the HLC NF. Recreation sites within the planning area that specifically tie to the Lewis and Clark National Historic Trail include the Lewis and Clark National Historic Trail Interpretive Center in Great Falls, Montana, as well as Lewis and Clark Pass in Alice Creek in the Upper Blackfoot GA, and Meriwether Day Use site within the Big Belts GA.

While on the HLC NF, the Lewis and Clark National Historic Trail crosses into both grizzly bear habitat and inventoried roadless areas within the Alice Creek Watershed” (Belote et al., 2017) in the Blackfoot River



drainage at Lewis and Clark Pass. This area is one of “the only mountainous sections along the route where modern visitors can experience the landscape in a roadless and relatively wild condition.” (Belote et al., 2017)

### 3.22.12 Lewis and Clark National Historic Trail, environmental consequences

#### Effects common to all alternatives

Since the trail is established by law, all the alternatives would continue to manage the trail as outlined in that legislation. Additionally, all alternatives would carry forward the need for continued education and interpretation along the trail and the need to work with partner groups.

#### Effects common to all action alternatives

Plan components developed for the Lewis and Clark National Historic Trail remain the same in all action alternatives. Table 227 summarizes the expected effects of each of these plan components.

**Table 227. Summary of plan components for the Lewis and Clark National Historic Trail**

Plan component	Summary of plan components for the Lewis and Clark National Historic Trail
FW-LCNHT-DC-01	This DC promotes the opportunity to for forest visitors to learn about the 1805-1806 journey of the Lewis and Clark expedition through the HLC NF.
FW-LCNHT-DC-02	This DC ensures that the Lewis and Clark National Historic Trail is clearly marked and identified.
FW-LCNHT-DC-03	This DC provides direction for the accuracy and delivery of interpretive and education themes along the Lewis and Clark National Historic Trail.
FW-LCNHT-GO-01	This plan component promotes working collaboratively with partners and volunteers to maintain the trail and deliver accurate and quality education and interpretation along the Lewis and Clark National Historic Trail.
FW-LCNHT-GDL-01	This GDL provides direction for the protection of the natural and cultural resources along the Lewis and Clark National Historic Trail.
FW-LCNHT-GDL-02	This guideline directs that vegetative management activities along the trail should only occur when consistent with the enhancement, protection, and/or interpretation of the Lewis and Clark National Historic Trail.

#### *Effects from forest plan components associated with:*

##### **Aquatic ecosystems and soil management**

Plan components and activities related to aquatic ecosystems and soil management would generally have little effect to the Lewis and Clark National Historic Trail. Where the trail crosses or parallel streams, plan components related to RMZs would help maintain the scenic quality of those areas, and therefore complement the management of the trail.

East of the Continental Divide (the majority of the HLC NF), RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. West of the Continental Divide, the area influenced by riparian plan components is the same across all alternatives because RMZs would be defined the same way as riparian habitat conservation zones are in the no-action alternative.

##### **Fire and fuels management**

Plan components for fire and fuels management would encourage an appropriate management response to wildfires that may occur near the Lewis and Clark National Historic Trail and provide opportunities for natural fire to alter the vegetation condition of the landscape. When fire does occur, whether natural or management-ignited, it could change the scenery visible from the trail, including charred vegetation in the short term as well

as regrowth in the longer term. Fire on the landscape would generally complement the scenic quality objectives for the trail.

### **Timber and vegetation management**

Relatively little of the Lewis and Clark National Historic Trail lies on NFS lands within HLC NF, and for the most part it is within or adjacent to designated wilderness areas. Further, plan components are in place stating that areas within ¼ mile of the trail are unsuitable for timber production. Therefore, plan components associated with timber harvest and vegetation management would have little effect to the management of the trail. Timber harvest could be visible in the distance from some parts of the trail. While harvest could have the potential to degrade scenic quality, such effects are unlikely to occur because of plan components to maintain a high or very high SIO.

### **Livestock grazing and management**

Livestock grazing allotments could occur along or in proximity to the trail. Evidence of grazing, including cows, cow patties, grazed vegetation, and permit administration could be observed. However, plan components for livestock grazing emphasize the maintenance of resilient native plant communities as well as desirable riparian area conditions. These components should help protect the scenic quality of the trail, to a greater degree with the action alternatives as compared to the no-action alternative.

### **Recreation and scenery management**

Recreation and scenery management plan components would complement the management of the Lewis and Clark National Historic trail by specifying ROS settings and scenic quality objectives that are consistent with maintaining or moving toward the desired conditions of the trail, along with providing the facilities and infrastructure (such as signs) needed for the public to access and use the trail system.

### **Cultural, historic, and tribal resource management**

Plan components for cultural, historic, and tribal resources would complement the management of the Lewis and Clark National Historic Trail by further protecting the resources that are integral to the value and purpose of the trail.

### **Road access and infrastructure**

The Lewis and Clark National Historic Trail generally lies in nonmotorized areas. To the extent that routes in proximity to the trail may be maintained, reconstructed, or relocated, the plan components for access and infrastructure would ensure that this work is done in a manner that has minimal impacts to other resources. These components would therefore complement the management of the trail.

### **Minerals management**

Areas along the Lewis and Clark National Historic Trail may be discretionarily unavailable for saleable mineral activity but still open to locatable mineral prospecting, exploration, and development.

### **Alternative A, no action**

In the no-action alternative, the Lewis and Clark National Historic trail would continue to be managed as per guidance under the National Parks and Recreation Act of 1978 and the direction provided for this trail in the 1986 Helena Forest Plans. The 1986 Lewis and Clark Forest Plan does not make any mention of the Lewis and Clark National Historic Trail as most of the route is located off-forest in the Lewis and Clark portion of the HLC NF. Table 228 describes the plan components in the 1986 Helena Forest Plans that provide direction for the Lewis and Clark National Historic Trail.

**Table 228. Summary of 1986 Helena Plan components for the Lewis and Clark National Historic Trail**

Plan component	Summary of the 1986 Helena Plan components for the Lewis and Clark National Historic Trail
1986 Helena NF Plan Goals 1 and 2, Page II/1	These plan components provide for a range of outdoor recreation opportunities, including motorized and nonmotorized recreation opportunities.
1986 Helena NF Plan, Forest-wide Standards, Cultural Resources, Page II/16	Provides direction for minimal disturbance along the Lewis and Clark National Historic Trail and interpretive sites during normal management practices.
1986 Helena NF Plan appendix B, Sensitive Viewing Areas, Page B/1	The Missouri River is identified as a Sensitivity Level 1 viewpoint and would be managed for the Retention Visual Quality Objectives in the foreground and Partial Retention Visual Quality Objectives in the middleground and background viewing distances.

### Alternative B-F

See effects common to all action alternatives, above.

### Conclusions

In alternative A, the no-action alternative, the Lewis and Clark National Historic Trail would continue to be managed as per guidance found in the National Parks and Recreation Act of 1978 and the 1986 Helena Forest Plan. The 1986 Lewis and Clark Forest Plan does not make any mention of the Lewis and Clark National Historic Trail as most of the route is located off-forest in the Lewis and Clark portion of the HLC NF. Alternatives B-F meet the purpose and need by providing plan components for the Lewis and Clark National Historic Trail. These plan components would remain the same in all action alternatives and support the National Parks and Recreation Act of 1978 by establishing guidance and direction for the trail within the 2021 Land Management Plan.

#### ***3.22.13 Lewis and Clark National Historic Trail Interpretive Center, affected environment***

The Lewis and Clark Interpretive Center opened its doors to the public on May 5, 1998. The building is approximately 25,000 square feet and includes a 158-seat theater, a 6000 square foot exhibit hall, and a 1500 square foot resource center that is used for education programming, training center, and reception area. It was established to further the public's understanding and provide appropriate interpretation of the scope and accomplishments of the Lewis and Clark Expedition, within the State of Montana and along the Lewis and Clark National Historic Trail. As an economic driver and top-rated attraction, the Lewis and Clark Interpretive Center serves not only Great Falls, but the community at large by educating visitors to the Great Falls area and the HLC NF. It also continues to be a resource for providing school programs to schools throughout Montana.

#### ***3.22.14 Lewis and Clark National Historic Trail Interpretive Center, environmental consequences***

##### Effects common to all alternatives

Since the Lewis and Clark National Historic Trail Interpretive Center was established by public law, all the alternatives would continue to manage the center as outlined in that legislation. Additionally, all alternatives would carry forward the need for continued education and interpretation at the interpretive center and the need and desire to work with partner groups to strengthen those interpretive and educational messages. These activities are common to all alternatives.

**Effects common to all action alternatives**

The plan components developed for the Lewis and Clark National Historic Trail Interpretive Center remain the same in all action alternatives. Table 229 summarizes the expected effects of each plan component related to the interpretive center.

**Table 229. Summary of plan components for the Lewis and Clark National Historic Trail Interpretive Center**

Plan component	Summary of plan components for the Lewis and Clark National Historic Trail Interpretive Center
FW-LCIC-DC-01; 02; 03	These desired conditions provide direction for the interpretive and education themes and exhibits at the Lewis and Clark Interpretive Center.
FW-LCIC-GO-01	This component promotes working collaboratively with partners and volunteers to operate, maintain, and deliver education and interpretation at the Lewis and Clark Interpretive Center.
FW-LCIC-GO-02	This goal focuses on the economic contributions of the Lewis and Clark Interpretive Center to the local community and the State of Montana.

*Effects from forest plan components associated with:*

Forest plan components associated with other resource management such as aquatic resources, soil, fire and fuels, timber and vegetation management, livestock grazing, wildlife management, recreation and scenery, cultural and historic resources, and road access and infrastructure would not have an effect to the Lewis and Clark National Historic Trail Interpretive Center due to its location.

**Minerals Management**

While the land that the Lewis and Clark National Historic Trail Interpretive Center is located on has not been withdrawn from mineral entry, it is not likely that this area would be affected by future minerals management.

**Alternative A, no action**

In the no-action alternative, the Lewis and Clark National Historic Trail Interpretive Center would continue to be managed as per guidance under Public Law 100-552 and the general direction provided in the 1986 Lewis and Clark NF Plan. There is no specific direction for the interpretive center provided by the 1986 Lewis and Clark Forest Plan. Table 230 describes the goals in the 1986 Lewis and Clark Forest Plan that provide general direction for the Lewis and Clark National Historic Trail Interpretive Center.

**Table 230. Summary of 1986 Lewis and Clark Plan goals that provide general direction for the Lewis and Clark National Historic Trail Interpretive Center**

Plan component	Summary of the 1986 Lewis and Clark Plan goals that provide direction for the Lewis and Clark National Historic Trail Interpretive Center
1986 Lewis and Clark NF Plan Goals 8 and 9, Page 2-2	Goals 8 and 9 mention the development of closer ties with local communities, governments, local Indian tribes, individuals and private groups for continued resource management and economic development.
1986 Lewis and Clark NF Plan Goal 10, Page 2-3	Goal 10 recognizes the need for public education programs in all FS planning to develop cooperative and mutually supportive relationships that will benefit both community and agency futures.

**Alternative B-F**

See effects common to all action alternatives, above.

**Conclusions**

In alternative A, the Lewis and Clark National Historic Trail Interpretive Center would continue to be managed as per guidance under Public Law 100-552 and the general direction provided in the 1986 Lewis and Clark NF

Plan. There is no specific direction for the interpretive center provided by the 1986 Lewis and Clark Forest Plan. Alternatives B-F meet the purpose and need by providing plan components for the Lewis and Clark National Historic Trail Interpretive Center. These plan components remain the same in all action alternatives and support Public Law 100-552 by establishing specific guidance and direction for the interpretive center within the 2021 Land Management Plan.

**3.22.15 Rocky Mountain Front Conservation Management Area, affected environment**

On December 19, 2014, President Obama signed into effect Public Law 113-291. Language within this law established the Rocky Mountain Front Conservation Management Area. The conservation management area includes approximately 195,073 acres of NFS lands and approximately 13,087 acres of federal land managed by the BLM. Under Public Law 113-291, the purpose for the conservation management area is to “conserve, protect, and enhance for the benefit and enjoyment of present and future generations the recreational, scenic, historical, cultural, fish, wildlife, roadless, and ecological values of the Conservation Management Area”. The law also directs the management of motorized vehicles on roads and trails, decommissioning of temporary roads, grazing, vegetation management, noxious weed management, and nonmotorized recreation opportunities.

**3.22.16 Rocky Mountain Front Conservation Management Area, environmental consequences**

**Effects common to all alternatives**

Since the conservation management area is established by Public Law 113-291, all the alternatives would continue to manage the area as outlined in that legislation. There is currently no direction provided for this area in the 1986 Lewis and Clark NF Plan.

**Effects common to all action alternatives**

The plan components developed for the conservation management area remain the same in all action alternatives. Table 231 summarizes the expected effects of each plan component related to the conservation management area.

**Table 231. Summary of plan components for the Rocky Mountain Front Conservation Management Area**

Plan component	Summary of plan components for the Rocky Mountain Front Conservation Management Area
FW-CMA-DC-01	This DC ensures the conservation management area conserves, protects, and enhances the recreational, scenic, historic, cultural, fish, wildlife, roadless, and ecological values of the area for the benefit and enjoyment of present and future generations.
FW-CMA-DC-02	This DC provides direction for the management of vegetation for the public health and safety, ROS settings and user experiences, enhanced scenic values, and the protection of facilities and infrastructure.
FW-CMA-DC-03	This DC provides access to nonmotorized trail opportunities in primitive and semiprimitive ROS settings.
FW-CMA-STD-01; 02	These STD provide direction for the construction of new or temporary roads, and the restoration of these roads after vegetation management along these roads has occurred.
FW-CMA-GDL-01	This GDL provides for the control, prevention, and eradication of invasive species with the conservation management area.
FW-CMA-SUIT-01	This plan component provides for the suitability of timber production. Specifically, lands within the conservation management area are not suitable for timber production. However, timber harvest may be used to meet other resource objectives.

Plan component	Summary of plan components for the Rocky Mountain Front Conservation Management Area
FW-CMA-SUIT-02	This suitability plan component allows for grazing to continue within conservation management areas on the forest.

*Effects from forest plan components associated with:*

**Aquatic ecosystems and soil management**

Plan components and management activities for aquatic ecosystems and soil management would complement the overall management of the Rocky Mountain Front Conservation Management Area by promoting the ecological integrity of watersheds, soil, and aquatic habitats.

East of the Continental Divide (where the conservation management area occurs), RMZs would be adopted and result in more acres being subject to riparian area plan components as compared to the no-action alternative, in which SMZs would be used. Potential vegetation treatments such as prescribed fire that may occur in the conservation management area may be limited within RMZs or modified to comply with plan components for those areas. The area on which these components apply is greater with the action alternatives than with the no-action alternative.

**Fire and fuels management**

Plan components for fire and fuels management would encourage an appropriate management response to wildfires that may occur within the conservation management area and provide opportunities for natural fire to promote the desired condition.

**Timber and vegetation management**

The Rocky Mountain Front Conservation Management Area is unsuitable for timber production. Timber harvest could occur for other purposes, although opportunities would be limited due to other regulations such as those specified for IRAs. Where it does occur, harvest may be used to help meet the desired conditions for the area, including enhancing public health and safety, scenic values, and protecting facilities and infrastructure (for example, mitigating hazardous fuels). Plan components for harvest would ensure that it is conducted in a manner that protects other resources. Plan components related to desired vegetation conditions could influence whether harvest or other treatments (such as management-ignited fires) are conducted and help define the objectives for those treatments.

**Livestock grazing and management**

The plan components for the action alternatives allow for livestock grazing. While mis-managed livestock grazing could degrade plant communities through factors such as invasive plant spread and damage to riparian areas, plan components emphasize the maintenance of resilient native plant communities as well as desirable riparian area conditions. These components should help protect the ecological values of the conservation management area, to a greater degree with the action alternatives as compared to the no-action alternative.

**Recreation and scenery management**

Plan components for recreation settings, opportunities, and access along with scenery management would complement the management of the Rocky Mountain Front Conservation Management area.

**Cultural, historic, and tribal resource management**

Plan components related to cultural, historic, and tribal resource would complement the management of the Rocky Mountain Front Conservation Management area.

**Road Access and infrastructure**

New or temporary road construction within the Rocky Mountain Front Conservation Management area would generally not occur, with a few specific exceptions (RM-CMA-STD-01). To the extent that relocation,

decommissioning, or road construction occurs, the plan components for road access and infrastructure would ensure that other resource values are protected.

**Minerals management**

In 2006, Public Law 109-432 withdrew the lands in the Rocky Mountain Range GA from mineral entry. The conservation management areas fall within these lands that have been withdrawn. Locatable mineral activities may still occur within the areas that have been withdrawn as long as a proponent has demonstrated they have a valid existing right.

**Alternative A, no action**

In the no-action alternative, the conservation management area would continue to be managed as per guidance under Public Law 113-291. There is currently no direction provided for this area in the 1986 Lewis and Clark NF Plan.

**Alternative B-F**

See effects common to all action alternatives, above.

**Conclusions**

In alternative A, the conservation management area would continue to be managed as per guidance under Public Law 113-291. There is currently no direction provided for the conservation management area in the 1986 Lewis and Clark NF Plan. Alternatives B-F would meet the purpose and need by providing plan components for the conservation management area. These plan components would remain the same in all action alternatives and support the legislation by establishing guidance and direction for the conservation management area within the forest plan.

**3.22.17 Cumulative Effects for Congressionally Designated Areas**

Land management plans may include additional plan components for the protection of congressionally designated areas within the planning area. There are several congressionally designated areas across the HLC NF. Plan components for the management of these areas have been identified in the Plan. In many instances congressionally designated areas extend beyond the administrative boundary of the HLC NF. Examples include designated wilderness boundaries, the Continental Divide National Scenic Trail, and the Lewis and Clark National Historic Trail.

Portions of the HLC NF adjoin other national forests, each of which have their own forest plans. The HLC NF is also intermixed with lands of other ownerships, including private lands, other federal, state, and tribal lands. Some adjacent lands are subject to their own resource management plans. The land management plans for adjacent federal, state, and tribal lands would generally be complementary to the 2021 Land Management Plan. The cumulative effects to congressionally designated areas from these other resource management plans with the 2021 Land Management Plan are summarized in Table 232.

**Table 232. Summary of cumulative effects to congressionally designated areas from other resource management plans**

Resource plan	Description and summary of effects
Blackfeet Nation: Wildland Fire Management Plan	The Blackfeet Nation’s Wildland Fire Management Plan is a strategic document that contains operational direction designed to guide a full range of fire management activities on a unit or area supported by land management plans. While not directly related to congressionally designated areas, this direction would generally be complementary to the plan components in the 2021 Land Management Plan.

Resource plan	Description and summary of effects
Bureau of Land Management (BLM): Resource Management Plans	BLM lands near the HLC NF are managed by the Butte, Missoula, and Lewistown field offices. All three plans have undergone recent revisions. These plans contain components related to wilderness and wild and scenic rivers and would therefore be complementary to the plan components found within the 2021 Land Management Plan.
Bureau of Reclamation (BOR): Resource Management Plans, * Canyon Ferry RMP * Canyon Ferry Reservoir Shoreline RMP	These documents describe the measures the BOR will take toward the restoration and management of BOR lands surrounding the Canyon Ferry Reservoir. While these plans do not specifically address congressionally designated areas, such as the Lewis and Clark National Historic Trail, the direction within them is generally consistent with the plan components in the 2021 Land Management Plan.
City of Helena: * Comprehensive Park Plan *Parks, Recreation, and Open Space Plan	The Parks, Recreation, and Open Space Plan (2010) includes goals and recommendations for open lands associated with the city which are immediately adjacent to NFS lands in the Divide GA. These measures would be consistent with the plan components in the 2021 Land Management Plan for congressionally designated areas.
County Growth Policies	These plans are integrated documents that focus on growth management and economic development strategies. These plans generally do not address congressionally designated areas. However, the Fergus County growth plan states that it will not endorse any state or federal monument, wilderness, or wildland designation, without the support of county constituents and commissioners. The 2021 Land Management Plan would not preclude meeting this requirement.
County Wildfire Protection Plans	The overall effect of these county wildfire protection plans would be to influence where treatments occur to contribute to desired vegetation conditions. Some county wildfire protection plans map and/or define the WUI. These plans mention, but do not address, congressionally designated areas.
Forest Service: Land Management Plans	The forest plans for NFS lands adjacent to the HLC NF include the Lolo, Flathead, Beaverhead-Deerlodge NFs and Custer-Gallatin NFs. The Flathead NF plan was revised in 2018 and the Custer-Gallatin NF plan is undergoing revision at the time this report was prepared. These plans address congressionally designated areas. Management of these congressionally designated areas is consistent across all NFs due to law, regulation, and policy. The management of designated areas in these other plans is consistent with direction in the 2021 Land Management Plan.
Montana State - DNRC: *Statewide Forest Resource Strategy *Habitat Conservation Plan *Water Plan	These plans guide resource management on state lands. They include many concepts that are complementary to plan components in the 2021 Land Management Plan. These plans do not address congressionally designated areas.
Montana State - FWP: Conservation Management Plans *Wildlife Action Plan *Big Horn Sheep Conservation *Elk Management Plan *Fish Management Program	These conservation management plans provide specific direction for the management for wildlife, and fish on Montana State lands. These plans do not address congressionally designated areas.
Montana State – State Parks: * Montana State Parks Strategic Plan (2020) *Statewide Comprehensive Outdoor Recreation Plan (SCORP)	The MT State Parks Strategy provides guidance to the state park program and addresses a strategic framework to strengthen the park system in Montana. The SCORP is a Montana statewide comprehensive outdoor recreation plan that serves as a guiding document to promote integrated outdoor recreation management and service provision in a more holistic and effective manner. These plans do not address congressionally designated areas.



Resource plan	Description and summary of effects
Montana State - MFAAC: Montana Forest Action Advisory Council (MFAAC) (2020) *Assessment of Forest Condition *Forest Action Plan	These plans aim to take a seamless and coordinated cross-boundary approach to address the pressing concerns of forest health and wildfire risk across all lands in Montana. Wilderness and wilderness study areas were mentioned in these documents and the recommendations are consistent with direction in the 2021 Land Management Plan.
Montana Army National Guard: Integrated Natural Resources Plan, Lime Hills Training Area	This natural resource management plan provides direction for the Lime Hills Training Area in the Elkhorns GA and was designed to support and accommodate military missions while providing for natural resource stewardship and management. The document focuses on native ecosystems, wildlife, fire, noxious weeds, livestock grazing, cultural resources, and road upgrades and maintenance. This plan does not address congressionally designated areas.
National Park Service (NPS): Glacier National Park, *General Management Plan (1999) *National Park Bear Mgmt. Plan	The general management plan for Glacier National Park calls for preserving natural vegetation, landscapes, and disturbance processes. Broadly, the wilderness characteristics in this area are likely like wilderness areas in the adjacent Rocky Mountain Range GA and would likely complement these conditions. This plan is consistent with the 2021 Land Management Plan direction for administratively designated areas. The National Park Bear Mgmt Plan outlines goals and objectives for the management of grizzly bears within the park. This plan does not address congressionally designated areas.
Natural Resources Conservation Service (NRCS): Strategic Plans *MT Soil Health Strategy * MT Sage Grouse Initiative Strategy	These plans do not address congressionally designated areas.

### 3.23 Cultural, Historical, and Tribal Resources

#### 3.23.1 Introduction

##### Cultural and historical resources

Cultural resources are defined by the National Historic Preservation Act and by FS Manual 2200, section 2360, as objects or definite locations of human activity, occupation, or use identifiable through field survey, historical documentation, or oral evidence. Cultural resources can be prehistoric, historic, or archaeological sites, structures, places, or objects and traditional cultural properties.

##### Areas of tribal importance

The FS has obligations under the American Indian Religious Freedom Act of 1978 to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian (Public Law 95-341). Executive Order 13007 of 1996 further directs federal agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting such sites. Consultation with recognized tribal governments is further defined and required by the Native American Graves Protection and Repatriation Act of 1990 (Public Law 101-601), the 1992 amendments to the National Historic Preservation Act, and the 1999 revisions to the implementing regulations in 36 CFR Part 800; Protection of Historic Properties. These obligations are applicable to all management actions no matter where they occur on the forest.

## Indicators

Key indicators used to measure the effects of alternatives are:

- Potential ground disturbance: management activities and natural disturbances can both pose a threat to sacred sites and other cultural and historical resources.
- Ease of access: the ability to access sacred sites is important to local Tribes. At the same time, greater access to some cultural and historical resources could lead to detrimental effects such as vandalism and looting.

These measurement indicators were identified and defined through consultation with Tribes. Consultation provides the opportunity for Tribes to identify potential effects to tribal interests, including to native knowledge, tribally affiliated cultural resources, sacred sites, treaty rights, and religious freedom. Ground disturbance is a key consideration for effects, as ground disturbance may negatively impact sacred sites and areas. These impacts can be further exacerbated by interactions with fire, weather events, human actions, and environmental change. Access to sacred areas to exercise religious ceremonies and freedoms is another key consideration for effects. Management actions that change access could either beneficially or negatively impact the exercise of treaty rights and expression of religious freedom.

## Changes between draft and final

No significant changes were made between draft and final. The only change was the removal of standard 2 from the Badger Two Medicine section. This was removed because that standard was already covered under established laws, regulations, and policies. It is important to remember that the Plan in no way changes our obligations under laws, regulations, and policies regarding cultural, historic, and tribal resources and those will be followed regardless of the decision. This means any desired conditions, objectives, standards, and guidelines in the Plan are in addition to all applicable laws, regulations, and policies.

### 3.23.2 Regulatory framework

#### Laws and executive orders

**American Indian Religious Freedom Act of 1978** (Public Law 95-341 as amended and Public Law 103-344): The Act states that “...it shall be the policy of the United States to protect and preserve for American Indians their inherent right for freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to site, use and possession of sacred objects, and the freedom to worship through ceremonies and traditional rites.”

Agencies must make a good faith effort to understand how Indian religious practices may come into conflict with other forest uses and consider any adverse impacts on these practices in their decision-making practices. The consideration of intangible, religious, ceremonial, or traditional cultural values and concerns which cannot be tied to specific cultural sites/properties could be considered under American Indian Religious Freedom Act.

**Archaeological and Historic Preservation Act of 1974** (16 USC 469) amends the 1960 Reservoir Salvage Act by providing for the preservation of significant scientific, prehistoric, historic and archaeological materials and data that might be lost or destroyed as a result of flooding, the construction of access roads, relocation of railroads and highways, or any other federally funded activity that is associated with the construction of a dam or reservoir.

**Archaeological Resources Protection Act of 1979** (Public Law 96-95) and Regulations 43 CFR Part 7 establish a permit process for the management of cultural sites on federal lands which provides for consultation with affected tribal governments.

**Executive Order 12866 of 1993, Regulatory Planning and Review:** Enhances planning and coordination with respect to both new and existing regulations. Makes process more accessible and open to the public. Agencies shall seek views of tribal officials before imposing regulatory requirements that might affect them.

**Executive Order 13287 of 2003, Preserve America** reinforces the federal government policy for “protection and enhancement of America’s historic treasures, and to recognize and treat cultural resources as assets. Federal agencies shall advance this policy through the protection of, continued use of, and reinvestment in, the federal government’s historic buildings and sites and by conforming to the highest standards of care for, and consideration of, the unique cultural heritage of communities, and of the Nation.” Each agency is directed to: (a) review its regulations, management policies, and general operating procedures for compliance with Section 110 of the National Historic Preservation Act, and (b) develop annual goals and measures as part of their compliance with the Government Performance and Results Act (P.L. 103-62) and report annually on the protection of historic and archeological properties within its care. The order also encourages the formation of partnerships with Indian tribes, state and local governments, and the private sector to promote public understanding of the preservation and use of historic properties.

**Executive Order 13007 of 1996, Indian Sacred Sites** directs federal agencies to, to the extent practicable, accommodate access to and ceremonial use of sacred sites by Indian religious practitioners while avoiding adversely affecting the sites and maintaining the confidentiality of the sites.

**Executive Order 12898 of 1994: Environmental Justice in Minority Populations and Low- Income Populations** directs federal agencies to focus on the human health and environmental conditions in minority and low-income communities, especially in instances where decisions may adversely impact these populations.

**Executive Order 13175 of 2000, Consultation and Coordination with Indian Tribal Governments:** Provides direction for consultation with tribal governments for formulating or implementing policies that have tribal implications. Also provides direction regarding consultation and coordination with Indian Tribes relative to fee waivers. Calls upon agencies to use a flexible policy with tribes in cases where proposed waivers are consistent with applicable federal policy objectives. It directs agencies to grant waivers in areas where the agency has the discretion to do so, when a tribal government makes a request. When a request is denied, the agency must respond to the tribe in writing with the rationale for denial.

**Executive Order 11593 of 1971, Protection and Enhancement of the Cultural Environment,** states that the federal government will provide leadership on preserving, restoring, and maintaining the historic and cultural environment of the Nation. It directs federal agencies through federal plans and programs to preserve cultural resources and contribute to the preservation and enhancement of nonfederally owned sites, structures, and objects of historic, architectural, or archaeological significance. It orders federal agencies to locate, inventory, and nominate to the National Register all properties under their control or jurisdiction that meets the criteria for nomination. It also directs federal agencies to exercise caution during the interim period to ensure cultural resources under their control are not inadvertently damaged, destroyed, or transferred.

**Historic Sites Act of 1935** (16 USC 461-467) declares that it is a national policy to preserve for public use historic sites, buildings, and objects of national significance for the benefit of the people of the U.S.

**National Historic Preservation Act of 1966** (public laws 89-665, as amended, 91-243, 94-422, 94-458 and 96-515) establishes a program for the preservation of historic properties throughout the United States. It created the National Register of Historic Places, State Historic Preservation Offices and the Section 106 review process.

- Section 106 requires each agency to take into account the effects of its actions on historic properties, prior to approving expenditure of federal funds on an undertaking or prior to issuing any license. Furthermore, an agency must afford the Advisory Council on Historic Preservation (an independent federal agency created by the National Historic Preservation Act) an opportunity to comment on any of the agency’s undertaking that could affect historic properties.

- Section 101(a) (8) gives the Secretary of Interior the responsibility and authority to assess “significant threats” to properties included in, or eligible for inclusion in, the National Register in order to: determine the kinds of properties that may be threatened, ascertain the causes of the threats, and develop and submit to the President and Congress recommendations for appropriate action.
- Section 110 (a) (2) (A) directs federal agencies to establish “a preservation program for the identification, evaluation, and nomination to the National Register of Historic Places, and protection of historic properties” to “ensure that such properties under the jurisdiction or control of the agency are identified, evaluated, and nominated to the National Register.” This requires development of a schedule for the identification, evaluation, and nomination of unrecorded sites.
- Section 111 encourages Federal Agencies to out-lease historic properties and retain the proceeds to fund preservation activities. If an agency determines the historic real property isn’t needed for current or projected agency purposes, under National Historic Preservation Act Section 111, they may lease (or exchange with comparable historic property) the property with any person or organization, if the agency determines that the lease or exchange will adequately ensure the preservation of the historic property.
- Section 470ii (c) states that “Each federal land manager shall establish a program to increase public awareness of the significance of the archaeological resources located on public lands and Indian lands and the need to protect such resources.” It further directs that an annual report of such progress will be submitted to Congress.
- Section 470mm directs federal agencies to:
  - Develop plans for surveying lands under their control to determine the nature and extent of archaeological resources on those lands;
  - Prepare a schedule for surveying lands that are likely to contain the most scientifically valuable archaeological resources; and
  - Develop documents for the report of suspected violations of this act and establish when and how those documents are to be completed by officers, employees, and agents of their respective agencies.
- Subdivision 1, Chapter 3001 directs the federal government to assist in the establishment of preservation programs on Indian lands. This directive emphasizes the use of partnerships to expand and accelerate preservation programs.

**Native American Graves Protection and Repatriation Act of 1990** (public law 101-601, 25 United States Code 3001-3013) **and Regulations 43 CFR Part 10** addresses the rights of lineal descendants and members of Indian tribes and Alaska Native and native Hawaiian organizations to certain human remains and precisely defined cultural items. It covers items currently in federal repositories as well as future discoveries. The law requires federal agencies and museums to provide an inventory and summary of human remains and associative funerary objects. The law also provides for criminal penalties in the illegal trafficking in Native American human remains and cultural items.

**Religious Freedom Restoration Act of 1993** (Public Law 103-141): Established a higher standard for justifying government actions that may impact religious liberties.

### Other regulation, policy, and guidance

**36 CFR 800** implements regulations for National Historic Preservation Act, Section 106. It provides explicit direction for the identification of sites, the determination of project effects on sites, requirements for consultation with state historic preservation offices, and the Advisory Council on Historic Preservation; and how to develop agreements.

**36 CFR 60** sets forth basic procedures of evaluation and nomination of sites to the National Register of Historic Places, procedures for the operations of state historic preservation officers, and minimum qualification standards for cultural resource professionals.

**36 CFR 79** establishes standards, procedures, and guidelines to be followed by federal agencies to preserve collections of prehistoric and historic material remains and associated records that are recovered in conjunction with federal projects and programs under certain federal statutes. This action should ensure that federally-owned and administered collections of prehistoric and historic materials remains and associated records are deposited in repositories that have the capability to provide adequate long-term curatorial services.

**36 CFR 261 Prohibitions in Areas Designated by Order; Closure of National Forest System Lands to Protect Privacy of Tribal Activities (2011):** “provides regulations regarding special closures to provide for closure of NFS lands to protect the privacy of tribal activities for traditional and cultural purposes to ensure access to NFS land, to the maximum extent practicable, by Indian and Indian tribes for traditional and cultural purposes”.

**36 CFR 223.239 and .240 Sale and Disposal of National Forest System Timber, Special Forest Products, and Forest Botanical Products:** Section 223.239 provides regulations for free-use without a permit for members of Tribes with treaty or other reserved rights related to special forest products. Also, free-use without a permit upon the request of the governing body of a Tribe. Section 223.240 provides regulations regarding harvest of special forest products by Tribes with treaty or other reserved rights.

The following elements authorize and guide cultural resource management activities on the HLC NF.

- Heritage Program Managed to Standard Performance Measures, 2011
- National Historic Preservation Act Programmatic Agreement regarding the Maintenance of Historic Buildings by the Region 1 Historic Preservation Team, 1992, as amended, and protocols
- National Historic Preservation Act Programmatic Agreement regarding the Management of Cultural Resource on National Forests in Montana, Programmatic, 2015, as amended, and protocols (Eastside Site Identification Strategy, travel management, bark beetle-hazard tree)
- Northern Region Historic Structure Assessment and Historic Preservation Plan
- Preserving Montana, The Montana Historic Preservation Plan, 2013-2017
- Historical Overview of the Helena and Deerlodge National Forest (Springer Beck, 1989)
- Overview: Ecological and Cultural Prehistory of the Helena and Deerlodge NF (Knight 1989)
- Ethnographic Overview of Selected Portions of the LCNF and Adjacent BLM lands (Deaver 1995)
- Lewis and Clark Trail on the Helena NF Preservation Plan (Scott 2001)
- Charter Oak Mine and Mill Preservation Plan (Davis 2003)
- Mann Gulch Fire Historic Landscape Preservation Plan (Randall 2014)

### **3.23.3 Assumptions**

- Only ~10% of the HLC NF has been inventoried for cultural resources. It is likely that additional cultural resources exist in areas that have not yet been inventoried.
- Increases in access can have a negative impact on cultural and historical resources due to unauthorized use, vandalism, and looting.

### **3.23.4 Best available scientific information used**

Heritage specialists determine whether existing cultural resource data is adequate to complete the environmental analysis and disclose potential effects on cultural resources. If the information is insufficient, additional research and inventory is undertaken as needed. Where additional inventory is needed, heritage personnel design a survey strategy to locate all historic properties within the area of potential effect. This strategy is designed in accordance with the criteria defined in “Site Identification Strategy Prepared for the East Side Forest”. If a survey discovers previously unknown cultural resources, those resources are recorded and their National Register eligibility status determined in consultation with the Montana State Historic

Preservation Office. Both background research and fieldwork are documented in a Section 106 report submitted to the State Historic Preservation Office. The Heritage Specialist consults with the State Historic Preservation Office to determine the nature of the project's effects on significant properties. If needed, the Heritage Specialist and the State Historic Preservation Office work together to determine appropriate project redesign, restrictions, designation of sensitive areas, or mitigation measures. The heritage specialist coordinates recommendations, actions, and monitoring with the project leader, the State Historic Preservation Office, and interested Tribal preservation officials.

Tribal knowledge and perspectives on cultural resources also represent a valuable source of information that can complement formal resource surveys and research. Their different systems of knowledge and belief are increasingly being accommodated in agency cultural resource management practices. Traditional cultural knowledge, sacred sites, and other places of tribal importance are now part of agency government-to-government and National Historic Preservation Act dialogue and interaction with tribes, and the HLC NF's heritage program will continue to consider traditional knowledge as an important source of information.

### ***3.23.5 Affected environment***

Central Montana was once a kaleidoscope of indigenous (American Indian) cultures. The planning area is the ancestral homeland and travel way of native bands now referred to as the Blackfeet, Chippewa Cree, Confederated Salish and Kootenai, Crow, Eastern Shoshone, Gros Ventre, Assiniboine, Sioux, Nez Perce, Northern Arapahoe, Northern Cheyenne, Shoshone-Bannock and the Little Shell Tribes (Aaberg et al 2007; Deaver 1995; Knight, 1989). Most prominent among the groups found in the planning area were those historically known as the Blackfeet, Gros Ventre, Salish, Kootenai and Metis. Today, these groups retain an active culture with an unbroken tie to the greater planning area.

Aboriginal use of the planning area over the centuries is thus manifest in hundreds of archaeological sites in addition to sacred sites and other areas of traditional cultural importance. The arrival of the Lewis and Clark and the Corps of Discovery to the planning area in 1805 marks the beginning of the historic period for central Montana. Following the Corps of Discovery's eastward departure from the planning area in 1806, a slow trickle and then a tide of trappers and explorers entered central Montana. The discovery of gold in and around Helena ushered in a wave of settlement and land use that transformed the planning area's natural and political landscape (Springer Beck, 1989). The first farming of the planning area began in the fertile river valleys adjacent to the mining camps (ibid). The entry of the railroads into the area boosted the agricultural industry considerably. Not only did railroad access provide transport for produce, it sought out and attracted farmers to Montana. The late 1910s and early 1920s brought severe drought and depression. The cattle industry in the planning area began with the use of the Oregon Trail in the 1840s. Continued mining and small-scale lumbering, ranching and homesteading typified the use of the planning area during the 1870s and 1880s. The first several decades of Forest administration saw each forest following similar trends as other NFs in the interior Northwest. Mapping of the forest occurred along with the establishment of initial communication lines, fire lookout locations and administrative sites.

The history of the planning area left behind hundreds of cultural and historic resources, and their condition varies by resource class, location, and age. Site monitoring and condition assessments of historic properties show a range of condition from "excellent" to "destroyed". Taken as a whole, historic properties across the planning area exist in fair condition.

### ***3.23.6 Environmental consequences***

#### **Effects common to all alternatives**

Compliance with the National Historic Preservation Act Section 106, and all other applicable federal laws and regulations, are required for all FS undertakings, regardless of the chosen alternative. The identification, evaluation, nomination, protection, and interpretation of cultural and historic resources would occur under all

alternatives. Coordination and consultation with interested parties would also continue in accordance with federal laws and regulations. Sites eligible for listing in the National Register of Historic Places would be evaluated and formally nominated to the Register. Protection protocols and mitigation measures would be used to preserve resources that are inadvertently discovered. All alternatives thus provide protection for cultural resources consistent with National Historic Preservation Act.

The effects to tribal interests are defined by tribes during consultation. Current management direction and requirements for consultation have been designed to ensure that areas on NFS lands that are important to Native Americans are not inadvertently impacted by the FS. Because management direction is required to follow all federal laws and regulations in respect to American Indian Rights and Interests, related effects are the same across all alternatives.

### Effects common to all action alternatives

All action alternatives contain plan components that explicitly state the desired conditions for cultural, historical, and tribal resources and provide guidance for achieving these desired conditions (See Table 233). Collectively, these plan components serve to ensure that potential adverse effects from land management and visitor use are avoided or minimized. The action alternatives also contain plan components designed to ensure that tribal knowledge and values are considered in management decisions and to provide access to the forest for traditional and ceremonial uses.

**Table 233. Summary of plan components for cultural, historic, and tribal resources**

Plan component	Intent and expected effects
FW-CR-DC-01, 03, 04	These DCs would help ensure that the public has the opportunity to visit and learn about cultural and historical sites as well as participate in conservation activities through volunteer programs.
FW-CR-DC-02; FW-RSUP-DC-04	These DCs are designed to ensure that historic buildings continue to provide for functional use while also reflecting local history and identity.
FW-CR-GO-01 and 02	These goals outline a process for supporting cultural resource inventories, research, management, and preservation through the use of cooperative agreements and partnerships as well as consultation with Native American tribes and traditional cultural practitioners.
FW-CR-GDL-01	This GDL is designed to ensure that maintenance of significant sites is designed in a way that includes conservation and preservation measures.
FW-CONNECT-DC-02, 03; FW-CONNECT-DC-GO-08, 09; FW-CONNECT-OBJ-02, 03; FW-CONNECT-GDL-01	Collectively, these plan components help to ensure that cultural and historic resources are conserved and appreciated through the provision of high-quality interpretive and educational programming that promotes conservation and stewardship. The guideline stresses that education should emphasize stewardship principles such as “Leave no Trace” to help minimize potential visitor impacts to natural and cultural resources.
BB-MISCOR-DC-03,04, 05	These components apply to the historically and culturally significant Missouri River Corridor and are designed to protect its unique cultural values and enhance appreciation of its history through education. DC-05 ensures that the historical and cultural resources are not degraded by potential increases in visitor use.
RM-BTM-DC-01	These components apply to the Badger Two Medicine Area, which has significant traditional and cultural value to the Blackfeet people. Plan components are designed to protect the cultural values of this area and ensure access for tribal members for ceremonial and cultural activities.
FW-TRIBAL-DC-01 and 02	These desired conditions recognize the importance of accommodating traditional, cultural, and religious uses of the forest that are essential to sustaining the way of life and cultural integrity of local tribes. Together, they ensure that sustainable populations of culturally significant flora and fauna remain available for harvest and that access to the Forest for the exercise of treaty rights is accommodated.

Plan component	Intent and expected effects
FW-TRIBAL-GO-01 and 02	These goals are designed to ensure that consultation with tribal members and the development of collaborative relationships enhances both knowledge and conservation efforts.
FW-REC-DC-04, 07; FW-RSUP-DC-02	These DCs are designed to ensure that recreation facilities, infrastructure, and their use do not harm cultural sites and resources.

*Effects from forest plan components associated with:*

**Infrastructure and access**

All action alternatives include plan components designed to provide public access to key cultural and historical resources while also ensuring adequate protection for these resources. While development and maintenance of infrastructure, such as roads and trails, have the potential to affect cultural and historical resources through ground disturbance, both plan components and legal direction ensure that any potential effects are considered and mitigated. Roads, trails, camping areas, and other infrastructure would be designed in such a way as to minimize any negative impacts associated with their construction and use.

Ease of access affects the degree of visitor use, and visitors have the potential to harm cultural and historical resources either inadvertently via trampling, which could expose sites and adversely affect their physical integrity, or through vandalism and looting, which result in the degradation or loss of cultural and historical artefacts. The proximity of sensitive cultural resources, such as rock art, rock shelters, historic structures, and Traditional Cultural Properties, to designated routes or areas is important when determining where resources could be susceptible to greater threats or risks. To minimize potential adverse effects, plan components associated with recreation infrastructure direct the construction of trails and barriers where needed to protect sensitive resources. Plan direction associated with visitor education can also help to minimize impacts from visitor use. Increased access may also have a positive impact on cultural and historical resources if it increases the rate of discovery of new cultural or historical sites.

Motorized vehicle use can be particularly harmful due to the potential for increases in both ground disturbance and ease of access. Unauthorized, user-created routes and areas can negatively affect historical and cultural resources. Direct effects of motorized use include physical damage resulting in or from erosion, down-cutting, rutting, or displacement of cultural features. Because adverse effects on cultural resources have been observed where motorized users have gone off road, the action alternatives provide direction to close and rehabilitate unauthorized recreation routes (FW-ACCESS-DC-01, GDL-01) in an effort to minimize future damage. Indirect effects associated with motorized vehicle uses include vandalism and looting, and can occur outside of designated routes and areas, such as at adjacent dispersed camping areas. Any adverse effects can be mitigated through compliance with plan direction and Section 106 of the National Historic Preservation Act.

The action alternatives also emphasize collaborating with tribal partners to ensure continued access to culturally significant areas. While tribes may traditionally have reached these places by foot or horseback, today, motorized vehicles are essential for reaching some locations, especially for elders who can no longer walk long distances. The Forest would consult with tribes when access and recreation management activities may impact treaty rights and/or cultural sites and cultural use. There is some potential risk to sacred sites where American Indians conduct ceremonies that require privacy. If a road were built to or near such a site, the associated increase in visitation could make it difficult to conduct ceremonies there, undermining the important cultural practice. A tribe could request the HLC NF to temporarily close the site to nontribal members for a short period under the 2008 Farm Bill Authority.

Sacred sites are likely to be in these areas. There is still a potential that landscape integrity and sacred sites may be affected because of the activities that are permitted under the action alternatives. However, prior to implementing resource management activities impacts on Tribal government and Tribal practices would be assessed and consultation requirements fulfilled.



### **Recreation management**

Recreation can potentially affect cultural, historical, and tribal resources through its effects on both ground disturbance and visitor use. Ground disturbance may occur either directly, through the construction and management of recreation sites, or indirectly, through the use of motor vehicles for recreation. All action alternatives contain plan components designed to avoid or mitigate these effects. As described above, new roads, campsites, trails, and other recreation infrastructure would be designed in a way that minimizes any adverse effects from construction and protects cultural and historical resources from the effects of future visitor use.

Recreation plan components emphasize providing opportunities for visitors to connect with and learn about both the natural *and cultural* environment. These opportunities could help to instill a sense of stewardship in forest visitors, potentially minimizing impacts to cultural and historical sites through careless use or direct vandalism.

The HLC NF manages portions of both the Continental Divide National Scenic Trail and the Lewis and Clark National Historic Trail, both of which have significant cultural and historical value. Plan components associated with management of these trails ensure that they conserve important cultural and historical resources while allowing visitors an opportunity to learn about the local history. The action alternatives all emphasize the use of partnerships to help protect cultural resources along these trails and enhance visitor experiences through the development of interpretive materials and programs.

### **Eligible wild and scenic rivers**

Several of the river segments that are identified as eligible to become WSRs are eligible at least in part due to their outstanding cultural value. Eligible WSRs must be managed to maintain the outstanding remarkable values for which they have been identified, which could result in greater protection for these river segments. Plan direction further specifies that any recreation facilities “must be located and designed to harmonize with the natural and cultural settings” (FW-WSR-GDL-01), which would ensure that any development would not detract from the cultural value.

Recreational use does have the potential to affect cultural and historic resources near eligible rivers, but the recreation plan components described above would also apply near eligible WSRs and would serve to avoid or mitigate any adverse effects associated with visitor use.

### **Vegetation management**

The plan components for vegetation management, including timber harvest and planned or unplanned ignitions, have the potential for adverse effects to cultural resources. The adverse effects can be caused by machinery and vehicles, including tree felling, skidding, and burning of slash piles and construction or reconstruction of roads. Any adverse effects can be mitigated through compliance with Section 106 of the National Historic Preservation Act.

All action alternatives include plan components that would help to restore vegetation to its natural condition and maintain resilient forests, which may provide protection to cultural and historical resources that could be negatively impacted by severe wildfires or other disturbances. Maintaining the integrity of ecosystems and associated plants and wildlife may also enhance the ability of tribes to harvest native species with cultural value and ensure that vegetation at sacred sites resembles what it would have historically.

### **Minerals**

Mineral activities such as mining and oil and gas exploration can have adverse effects on tribal resources and culturally important landscapes, but the action alternatives include plan components designed to avoid or mitigate these effects. The Forest would consult with tribes when mineral management activities may impact treaty rights, cultural sites, or traditional uses. The action alternatives place a greater emphasis on ongoing communication and collaboration with tribal stakeholders compared to alternative A.

### Alternative A, no action

The 1986 Forest Plans are focused on Section 106 compliance and do not consider a balance between compliance, stewardship, and protection of cultural and historical resources. However, numerous federal laws and regulations exist for the protection and enhancement of these resources regardless of any forest plan direction. Compliance with federal laws and regulations would continue.

Alternative A does not include identified traditional/cultural special areas. Therefore, it does not provide the Forest with specific direction for the management of these areas. Alternative A does have a forestwide standard for cultural resources that requires the Forest to consult with Native American traditional religious leaders on any project having the potential to affect Native American cultural sites and practices.

### Alternatives B - F

Protection of cultural and historic resources is expected to be higher under all action alternatives, compared to alternative A, due to more specific and actionable plan components and collaborative management approaches. For alternatives B - F the Plan directions are the same and only the size and location of the land allocations change, resulting in differences in the potential for active management, motorized recreation, and public access.

#### *Differences in the potential for ground disturbance*

More management can mean more potential for harm related to ground disturbance. At the same time, an increase in projects may result in the discovery of new cultural resources and would provide the heritage program an opportunity to conduct National Historic Preservation Act Section 106 inventories, which in turn creates a more complete picture of how people have used the landscape. More motorized recreation could also increase the possibility of disturbance to sensitive cultural and historical resources.

All action alternatives have some level of treatment and that amount does not differ greatly between alternatives, so they would have a similar possibility of ground disturbance from management. Any impacts from land management would be small and could be avoided or mitigated by following plan direction and complying with applicable laws and regulations. Alternative F has the greatest projected acres of timber harvest in the first decade, thus has the greatest potential for ground disturbance from timber harvesting activities. However, across the next 5 decades alternative F is projected to harvest fewer acres than A, B, C, or D, given a constrained budget.

Alternative E has the greatest number of roads and trails open to motorized recreation. Alternative E thus has the greatest potential for ground disturbance from motorized recreation while alternative D has the least due to its emphasis on RWAs. These impacts are also expected to be small and would be further minimized by following plan direction in the action alternatives.

#### *Differences in public access and associated impacts*

Greater public access can also mean more potential harm to cultural and historical resources due to trampling, vandalism, and looting. Different alternatives propose different amounts of RWAs or differences in motorized and mechanized access within them, which can affect ease of access and visitor use. Alternative D would provide the most RWAs, and therefore, the greatest protection to cultural, historical, and tribal resources through limited use. Alternative E does not recommend any RWAs, and so provides the least protection from visitor use and active land management. While alternatives B, C and F recommend the similar amount of wilderness, alternative C allows existing motorized and mechanized recreation to continue, which would potentially result in greater access and greater impacts due to ground disturbance from motorized vehicles.

#### *Differences in tribal access for traditional and ceremonial uses*

While roads can increase access and consequently the potential for harm from visitor use, they also provide access for managing cultural sites and visiting areas of tribal importance. Those alternatives with the least

motorized access (alternatives D and B) could have a negative effect on tribal access, even though lack of access may also help to preserve and protect tribal resources from use and vandalism by nontribal members. All action alternatives would rely on forestwide elements specific to American Indian Rights and Interests to recognize impacts that may result from wilderness and primitive management.

**Cumulative Effects**

Cumulative effects, over time, can include loss and damage to cultural, historical, and tribal resources. The effects that past activities have had on cultural, historical, and tribal resources are reflected in the current condition of these resources as described in the affected environment section.

Cultural, historical, and tribal resources on many of the lands surrounding the HLC NF are also protected by law. All federal land management agencies must follow the same federal laws and regulations in regard to cultural resources. All state-owned land must follow the Montana State Antiquities Act as amended 1995 or the administrative rules written by the State Historic Preservation Office in 1999. Private land owners are not required to follow any laws or regulations in regard to cultural resources, with the exception of human skeletal remains. If human skeletal remains are found on public or private land, the Montana Human Skeletal Remains and Burial Site Protection Act (1999) applies, or applicable federal laws. The cumulative effects to cultural, historical and tribal resources from these other resource management plans with the 2021 Land Management Plan are summarized in Table 234.

**Table 234. Summary of cumulative effects to cultural, historical and tribal resources from other resource management plans**

Resource plan	Summary of effects
Blackfeet Wildland Fire Mgt. Plan	Tribal lands have their own laws and regulation in regard to cultural resources, however these are consistent with cultural, historical and tribal resource plan components.
Federal Government Agencies: Bureau of Land Management, Bureau of Reclamation, USDA Forest Service, Natural Resource Conservation Service and Glacier National Park	All federal land management agencies must follow the same federal laws and regulations in regard to cultural resources. The plan components for cultural, historical, and tribal resources are consistent with these other plans.
County Growth Policies and County Wildlife Protection Plans	All county-owned land must follow the Montana State Antiquities Act or administrative rules written by the State Historic Preservation Office. The plan components for cultural, historical, and tribal resources are consistent with these other plans, when these resources are mentioned. Private lands is not required to follow any laws or regulations in regard to cultural, historical, or tribal resources, with the exception of human skeletal remains.
Montana State	All state-owned land must follow the Montana State Antiquities Act or administrative rules written by the State Historic Preservation Office. The plan components for cultural, historical, and tribal resources are consistent with these other plans when these resources are mentioned.
City Plans	All city-owned land must follow the Montana State Antiquities Act or administrative rules written by the State Historic Preservation Office. The plan components for cultural, historical, and tribal resources are consistent with these other plans when these resources are mentioned.

**Conclusions**

Management actions that result in ground or structural disturbance have the potential for effects to cultural resources and sacred sites, but all action alternatives include components designed to avoid or minimize any adverse effects. Furthermore, potential effects are identified, detailed, and disclosed during site-specific

analysis, which gives the FS the opportunity to determine appropriate mitigation, avoidance, and protection measures. Thus, the consequences to cultural resources from actions associated with other programs such as fire and fuels management, access and recreation, vegetation management and nonnative invasive plant management programs are estimated to be minimal or avoidable under all alternatives.

Visitor use also has the potential to harm cultural and historical resources, and so differences in access can affect the potential for harm and associated mitigation measures. All action alternatives contain components designed to minimize this risk using education and strategic placement of recreation infrastructure to protect sensitive resources. Access to sacred sites is also a key issue for local Tribes. While some alternatives do provide fewer restrictions on access, the Forest would collaborate with Tribes to accommodate access to and ceremonial use of sacred sites under all alternatives.

## 3.24 Lands and Land Uses

### 3.24.1 Introduction

This section addresses land ownership administration, adjustments, and special uses of NFS lands on the Forest. Management of NFS land includes surveying, marking, and posting of ownership boundaries, acquisition, conveyance and exchange of lands and interests in lands, disposition of title claims and encroachments, acquisition of rights-of-way, and authorization and management of land use authorizations to protect resource values and interest of the public managed by the FS.

Land ownership status on National Forest lands can change over time through land adjustments. Land adjustments involve transfer of fee title and result in a change of legal ownership. Adjustments of land ownership occur through land exchange, land purchase, land donation and conservation easements. There may also be congressionally mandated landownership adjustments.

Land occupancy and use by private parties and other government entities is managed through the issuance of special use authorizations. Authorized special uses on the HLC NF include industrial or commercial uses, private uses, and a variety of recreational uses.

All occupancy, use, or improvements on NFS lands that are not directly related to timber harvest/forest products, grazing, mining activities, and recreation are referred to as ‘lands special uses.’ The most common lands special uses include: roads, utilities, storage facilities, communications sites, research, water transmission, and commercial filming. Recreation special uses and events include: resorts, ski areas, outfitter and guides, and a variety of uses that provide access and use of NFS lands by commercial ventures. For more information see the Recreation Special Uses section.

#### Changes between draft and final

Edits and corrections were made to the analysis provided in the DEIS to address public comments. Consideration and analysis of alternative F was also added to this section.

Wording in the Land Status and Ownership, and Land Uses section was changed in a number of places for clarification and ease of reading.

The following changes to plan components were made:

- Desired Condition FW-LAND-DC 05 was added.
- Goal FW-LAND-GO 01 was added.
- Guideline FW-LAND-GDL 02 was changed.
- Desired Condition FW-LAND USE-DC 02 was changed.
- Desired Condition FW-LAND USE-DC 03 was added.

- Goals FW-LAND USE-GO 02 was changed.
- Goal FW-LAND USE-GO 03 was added.
- Guideline FW-LAND USE-GDL 01, 02, 03, 04, 05, and 06 were changed.

Vegetation Management of Utilities in March 23, 2018 Omnibus Bill, Cabin Fee Act, December 19, 2014, and 36 CFR 212 – Travel Management and Reciprocity were added to Regulatory Framework.

### **3.24.2 Regulatory framework**

The following is a select set of statutory authorities that govern landownership adjustments and the issuance and administration of special use authorizations on the HLC NF. They are briefly identified/described below to provide context to the management and evaluation of these resources. There are multiple other laws, regulations and policies not described below that also guide the management of these programs; see FSM 2700, 5400, and 5500 for a comprehensive listing.

#### **Law and executive orders**

**Act of November 16, 1973** (30 U.S.C. 185): This act, amending Section 28 of the 1920 Mineral Leasing Act, authorizes the FS to issue authorizations for oil and gas pipelines and related facilities located wholly on NFS land. When the lands are under the jurisdiction of two or more federal agencies, authority for issuance is reserved to the USDI, BLM, subject to approval by the agencies involved.

**Act of May 26, 2000** (16 U.S.C. 4061-6d): This act supplements the authority of the Secretary of Agriculture to regulate commercial filming and still photography on NFS lands. It also authorizes the Secretary to retain and spend land use fees collected for commercial filming and still photography without further appropriation and provides for recovery of administrative and personnel costs in addition to the collection of the land use fee.

**Alaska National Interest Lands Conservation Act of 1980** (16 U.S.C 3210): provides numerous authorities related to access that are specific to national forests in Alaska (except for sec. 1323(a), which applies to all NFS lands; see the following paragraph b). The provisions of section 1323(a) (16 U.S.C. 3210) apply to all NFS lands. This section provides that, subject to terms and conditions established by the Secretary of Agriculture, the owners of nonfederal land within the NFS shall be provided adequate access for the reasonable use and enjoyment of the non-federal lands, as determined by the authorized officer. Regulations implementing section 1323(a) are set forth at Title 36, Code of Federal Regulations, Part 251, and Subpart D -Access to Non-federal Lands. See FSM 2701.3, paragraph 3, for the summary of the provisions of 36 CFR 251, Subpart D.

**Cabin Fee Act, December 19, 2014.** This act established a new method for determining special use fees for the Recreation Residence Program by using a fee table and institutes a transfer fee in the event that a cabin changes ownership. Section (k) of the CFA repeals the former law that governed the fees - the Cabin User Fee Fairness Act of 2000 (CUFFA).

**Energy Policy Act of 2005, August 8, 2005,** Section 1211(c), Access Approvals by Federal Agencies (Public Law 109-58), states “Federal agencies responsible for approving access to transmission and distribution facilities located in the U.S. shall expedite any Federal agency approvals that are necessary to allow the owners or operators of such facilities to comply with reliability standards regarding vegetation management, electric service restoration, or resolution of situations that imminently endanger the reliability or safety of the facilities.”

**Executive Order 13212, May 18, 2001,** Actions to Expedite Energy-Related Projects, orders executive departments and agencies to take appropriate actions, to the extent consistent with applicable law, to expedite projects that will increase the production, transmission, or conservation of energy. Code of Federal Regulations (CFR).

**Executive Order 13604, March 22, 2012**, Improving Performance of Federal Permitting and Review of Infrastructure Projects, states that “it is critical that executive departments and agencies take all steps within their authority, consistent with available resources, to execute Federal permitting and review processes with maximum efficiency and effectiveness...”

**General Exchange Act of March 20, 1922** (16 U.S.C. 485, 486): This act authorized the FS to consolidate its holdings in NFs where a large percentage of private lands were intermingled with NFS lands. It made possible the exchange of inholdings within NFs for private lands of equal value and within the same state.

**Highway Act of August 27, 1958** (23 U.S.C. 317), supplemented by the Act of October 15, 1966 (49 U.S.C. 1651): This act authorizes the Federal Highway Administration to grant easements to States or counties for highways that are part of the federal-aid system or that are constructed under the provision of chapter 2 of the Highway Act. The FS consents to the grant of these easements in a form agreed upon by the two agencies and upon the public road management agency's execution of stipulations. This is the only authority for granting rights-of-way for projects on the federal-aid system or projects constructed under the provisions of chapter 2 of the Highway Act (FSM 2731).

**Occupancy Permits Act of March 4, 1915** (16 U.S.C. § 497 et seq.) as amended: This act authorizes use and occupancy on NFS land for recreational purposes including resorts and recreation residences.

**Organic Act of August 3, 1956** authorizes acquisition of lands and interests in lands. This act authorizes the Forest Service to acquire lands or interests in lands as necessary to carry out its authorized work.

**Small Tracts Act of January 12, 1983** (16U.S.C. 521c-521i): This act authorizes the sale, exchange, or interchange of certain parcels of minimal size as amended.

**Vegetation Management of Utilities in March 23, 2018 Omnibus Bill** amends Title V of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1761 et seq.) to add the following: Vegetation Management, Facility Inspection, and Operation and Maintenance relating to electric transmission and distribution facility rights of way.

### Code of Federal Regulations (CFR)

The following regulations provide direction for special uses management on NFS lands:

36 CFR 212 – Travel Management and Reciprocity

36 CFR 251 – Land Uses

36 CFR 254 – Landownership Adjustments

### 3.24.3 Assumptions

As population increases, expected trends include a greater use of NFS lands by the recreating public, particularly those areas close to population centers. There is also expected to be more development of private lands adjacent to forest and on private inholdings within the forest boundary. Private access needs will likely increase. This may also result in challenges from other landowners to existing and perceived access to NFS lands, as private landowners are becoming more reluctant to grant easements. Reciprocity shall be applied when granting authorizations to ensure that any needed access rights across non-NFS lands are obtained in the process. Access in general across all NFS lands, and existing easements, is becoming more difficult to obtain. This is expected to continue into the future.

### 3.24.4 Best available scientific information used

The Forest used the best available data and scientific information relevant to inform the analysis for the draft plan components for lands and land uses. Data sources included information stored in the corporate data base and site-specific knowledge from forest personnel.

### 3.24.5 Affected environment

#### Lands

The total acres of NFS lands that are the administrative responsibility of the Forest are a result of the original Congressionally designated lands and the conveyances (acquisitions, disposals, and exchanges) that have occurred to date. The HLC NF landownership pattern varies with location. The pattern can be characterized as:

- Large blocks of uninterrupted, contiguous NFS lands;
- NFS lands surrounding isolated tracts of private lands;
- NFS lands surrounded by isolated tracts of private lands;

#### Ownership

In 1986 when the current forest plans went into effect, the HLC NF included 2,825,580 acres of NFS lands. Since 1986, NFS ownership has increased by 20,906 acres on the Lewis and Clark NF portion and increased by 5,257 acres on the Helena NF portion of the forests.

There have been other land acquisitions across the Forest using appropriated funds, typically through the Land and Water Conservation Fund. Additionally, the Forest periodically exchanges lands for the mutual benefit of each party and the public. While there are still some areas of the HLC NF that have intermingled ownerships of land, there are no notable acquisitions or exchanges of lands in process, partly due to decreased lands funding.

#### Special uses

Some uses of NFS lands are covered by special use authorizations, including permits, leases, and easements that allow occupancy, use, rights, or privileges on the HLC NF.

The HLC NF currently administers 295 lands special use authorizations that are issued within the planning area (Table 235). These include current authorizations and authorizations that have expired. In the instances of authorizations that have expired, the use is still occurring, and annual fees are being collected.

**Table 235. Special use authorizations**

Type of use	Number of authorizations
Agriculture	82
Community and Public Information	11
Feasibility, Research, Training, Cultural Resources and Historical	12
Industry	2
Energy and Gas Transmission	22
Transportation	115
Communication Uses	41
Water Transmission/Storage	7
Military Training and Facilities	3
Total	295

Lands special uses range from permits for individuals to use NFS land for their driveways, to more extensive uses such as powerlines, fiber optic cable, telephone lines, and oil and gas pipelines that cover many miles of NFS lands providing critical infrastructure to support the health, safety and well-being of the American public. Other land uses include communications towers, research studies, fences, signs, and service buildings.

The majority of the land use authorizations are for transportation-related uses and the majority of recreation uses are for recreation residences. There are a large number of unauthorized transportation uses in the planning area. With recent travel plan decisions, roads accessing private land that were open to the public in the past have been closed to public use. Use of these roads by private landowners requires a special use authorization. At present, the FS lacks the resources it needs to manage the special uses program (Harden, 2011). For this reason, the HLC NF special use program has not had the resources to process the large number of special use road authorizations which would allow legal use of these roads by private landowners.

In the 1986 Forest Plans, utility rights of way and communication sites are not identified. Each forest plan should include three basic elements to identify areas designated for suitable for utility uses: 1) text or reference in the plan itself, 2) maps, and 3) tables. For communication sites, the forest plan should identify areas that are not suitable (e.g. wilderness).

### Access

In this section, access refers to the easements held by the U.S. government and administered by the FS across non-NFS land for the management of NFS lands. This generally and preferably includes access by the public across these lands. There will likely be more challenges to historic access that currently exists and a greater need to perfect access to NFS lands. The FS will continue to pursue reciprocal right of way opportunities in an effort to continue securing access.

There is a need to identify those areas where there are access issues and to continue pursuing access in these areas.

## 3.24.6 Environmental consequences

### Effects common to all alternatives

None of the alternatives propose to make any site-specific changes to the existing landownership on the HLC NF. No conveyances (acquisitions, disposals, or exchanges) are proposed. Any of these actions would only be considered at the project level. Until an external entity presents a proposal there would be no changes to the existing landownership pattern.

Since no changes in landownership are proposed, the number of acres of NFS lands remains the same for all four alternatives. None of the alternatives propose to make any site-specific changes to existing special use authorizations or rights-of-way on the HLC NF.

Due to differences in RWAs and lands suitable for timber production between alternatives, there could be an effect on the number of new access proposals that would be submitted resulting in a larger workload for land uses staff. Vegetation management also creates the need for easements to be acquired by the Forest Service, and reciprocal right-of-way opportunities. All alternatives include plan components that allow for vegetation management. These effects are described below in each alternative.

### Effects common to all action alternatives

The expected effects of each Lands and Land Uses plan component for the action alternatives is summarized in Table 236.

**Table 236. Summary of plan components for lands and land uses**

Plan component	Intent and expected effects
FW-LAND-DC-01, 03, 04; FW-LAND-GO-01; FW-LAND-GDL-02	These plan components would help ensure that land ownership within the planning area is managed to enhance and protect resources. The protection of the land, title and resources of the public estate managed by the Forest Service is essential to ensure the conservation of the public estate for current and future generations.
FW-LAND-DC-02;	These plan components would ensure legal access to NFS lands is secure.



<b>Plan component</b>	<b>Intent and expected effects</b>
FW-LAND-OBJ-01; FW-LAND-GDL-01	
FW-LAND-DC-05; FW-LAND-OBJ-02	Development in the wild-land-urban-interface adjoining NFS lands threatens public land and resources where property boundaries are not clearly marked. Unmarked boundaries create situations for trespass, encroachments, title claims and unauthorized use. These plan components help to ensure NFS property lines are surveyed, identified, and marked.
FW-LAND USE-DC-01, 02, 03; FW-LAND USE-GDL 01	These plan components are designed to ensure for the use of NFS lands that provide a benefit to the general public.
FW-LAND USE-GO-01, 02; FW-LAND USE-GDL-01	These plan components ensure road use is managed in a way that provides for reasonable access to private and other lands within the planning area.
FW-LAND USE-GO-03; FW-LAND USE-GDL-02, 03, 04, 05, 06, 07	These plan components were designed to ensure that land uses are managed in a manner that provides for public safety and protection of natural resources.

Effects from forest plan components associated with:

#### **Fire and fuels management**

Unplanned and prescribed fires would continue to affect the long-term ecological processes across recreation settings and may impact the location and availability of recreation opportunities on the Forest. Fire could create a temporary loss of vegetation, reduction in water quality due to sedimentation, and air pollution which could cause displacement of some forest visitors to other areas on the forest or to other forests in the region. There is a need to increase landownership consolidation of non-NFS and NFS lands to facilitate fire and fuels management.

#### **Vegetation management**

Vegetation management creates the need for easements to be acquired by the Forest Service, and reciprocal right-of-way opportunities. There would be an increased need for boundary management which likely would daylight encroachments that were not previously known.

#### **Recreation management**

NFS lands with developed recreation sites (e.g., campgrounds) are less likely to be considered for conveyance or exchange. This effect would be common to all alternatives.

#### **Wildlife habitat management**

NFS lands that provide secure habitat or contribute as linkage areas are less likely to be considered for disposal or exchange. The impact is the same for all alternatives since the lands where these conditions exist does not vary between the alternatives.

#### **Road access and infrastructure**

For those areas with high development and use of FS roads by private landowners, the HLC NF would cooperate with counties to obtain a Forest Roads and Trails Act easement from the FS transferring jurisdiction to the counties. Forest roads are maintained at a level suitable for FS administrative purposes not for access to private. They were not designated or maintained for residential development, only for NF management. Counties manage roads for commercial and residential access as part of their fundamental management objective. Counties produce effective public services expected by their constituents, including police and fire protection, school bus routes, plowing snow, and the overall regulation of traffic.

### **Riparian management zone management**

NFS lands that contain RMZs would be less likely to be considered for disposal or exchange. These areas would be avoided for new land uses and RMZs that have existing uses would have protection measures in place through permit terms and conditions.

### **Alternative A, no action**

The RWAs included in this alternative include the three areas designated in the 1986 Forest Plans. Motorized and mechanized means of transportation remain suitable in these areas in this alternative; there would be little to no impact relative to authorizing access to private land inholdings.

This alternative includes lands suitable for timber production; the amount in this alternative is greater than all other alternatives. Managing lands for timber production could affect land values; and increase the need for Forest Service requiring access across private lands to timber management areas.

The 1986 Forest Plans include standards for elk security. Due to their specificity, these standards can limit or preclude vegetation management that is needed to maintain utility corridors. This alternative includes plan components to seek land adjustments and acquire easements to support long-term forest goals and objectives. The Plan also provides for special uses that private land cannot reasonably support and uses that support forest goals and objectives.

### **Alternative B**

This alternative includes nine RWAs; the amount of RWAs in this alternative is greater than alternatives A, F, and E; and the same as alternative C. Under this alternative, motorized and mechanized means of transportation would be unsuitable in RWAs. Therefore, this alternative could have an effect on new access proposals in RWAs and increase the workload related to authorizing access to private land inholdings.

This alternative includes lands suitable for timber production; the amount in this alternative is similar to C, D, and F, and less than E and A. Managing lands for timber production could affect land values; and increase the need for Forest Service requiring access across private lands to timber management areas.

This alternative includes big game plan components that are designed to influence big game distribution to provide big game hunting opportunities on NFS lands during both the archery and rifle hunting seasons. These components are included in B, E, and F and are not included in alternatives C and D. These components are more flexible than the elk security plan components in alternative A; therefore, the potential constraints to utility corridor management are less than alternative A; but greater than the alternatives that do not include any big game plan components (C and D).

### **Alternative C**

This alternative includes nine RWAs; the amount of RWAs in this alternative is greater than alternatives A, F, and E; and the same as alternative B. In contrast to alternative B, under this alternative motorized and mechanized means of transportation would remain suitable in RWAs. Therefore, while this alternative could have an effect on new access proposals in RWAs, it would not impact the workload related to authorizing private land inholdings as compared to alternatives B, D, and F.

This alternative includes lands suitable for timber production; the amount in this alternative is similar to B, D, and F, and less than E and A. Managing lands for timber production could affect land values; and increase the need for Forest Service requiring access across private lands to timber management areas.

This alternative does not include plan components specific to big game, and therefore would not limit or preclude vegetation management along utility corridors.

## Alternative D

This alternative includes sixteen RWAs; the amount of RWAs in this alternative is greater than all other alternatives. Under this alternative, motorized and mechanized means of transportation would not be suitable in RWAs. This alternative could have an effect on new access proposals in RWAs. It would potentially create the largest workload relative to special uses because it would not allow mechanized uses and would change to nonmotorized use during the winter, which could increase the workload for authorizing access to private inholdings.

This alternative includes lands suitable for timber production; the amount is similar to B, C, and F; and less than E and A. Managing lands for timber production could affect land values; and increase the need for Forest Service requiring access across private lands to timber management areas.

This alternative does not include plan components specific to big game, and therefore would not limit or preclude vegetation management along utility corridors.

## Alternative E

This alternative includes no RWAs, and therefore would have no impacts related to new access proposals or the workload associated with authorizing access to private inholdings.

This alternative includes lands suitable for timber production; the amount is the greatest of the action alternatives, but still less than alternative A. Managing lands for timber production could affect land values to the greatest degree; and increase the need for Forest Service requiring access across private lands to timber management areas.

This alternative includes big game plan components that are designed to influence big game distribution to provide big game hunting opportunities on NFS lands during both the archery and rifle hunting seasons. These components are included in B, E, and F and are not included in alternatives C and D. These components are more flexible than the elk security plan components in alternative A; therefore, the potential constraints to utility corridor management are less than alternative A; but greater than the alternatives that do not include any big game plan components (C and D).

## Alternative F

This alternative provides a mix of RWAs; it has more RWAs than alternatives A and E, but less than B, C, and D.

This alternative includes lands suitable for timber production; the amount in this alternative is similar to B, C, and D, and less than E and A. Managing lands for timber production could affect land values and increase the need for Forest Service requiring access across private lands to timber treatment areas.

This alternative includes big game plan components that are designed to influence big game distribution to provide big game hunting opportunities on NFS lands during both the archery and rifle hunting seasons. These components are included in B, E, and F and are not included in alternatives C and D. These components are more flexible than the elk security plan components in alternative A; therefore, the potential constraints to utility corridor management are less than alternative A; but greater than the alternatives that do not include any big game plan components (C and D).

## Cumulative Effects

At this time the HLC NF is not actively pursuing any adjustments in landownership. But, in recent years, external entities have made land acquisitions and have transferred ownership to the NFs; and there is some likelihood that these types of actions may continue. Any change (increase or decrease in total NFS lands) is dependent on what actions might be approved. Outright purchase and transfer would most likely result in an increase in the acres of NFS lands. Land exchanges, on the other hand, may result in a decrease in the acres of

NFS lands. There are some small community-based conveyances occurring on the forest. There may be an increase in the number of these conveyances.

The Forest can expect requests for special use authorizations to continue. As more private land is subdivided there is usually an associated increase in requests for road special use permits and utility easements. Requests for modification of existing authorized communication sites and designation of new communication sites can reasonably be expected as technological advances (e.g., cell phones) are made. On the HLC NF these sites typically occupy small acreages (1 to 2 acres).

Boundary survey and marking would increase with vegetation management and fire programs. Along with this, more encroachments are likely to be discovered.

Activities on adjacent lands under private ownership and from other land management agencies such as state, city, county and private may have an effect on land management in the planning area. An example would be the Black Butte mine project in the Sheep Creek area of the Little Belts, which may potentially impact adjacent land and management of NFS lands in the area. The cumulative effects to lands and land uses from these other resource management plans with the 2021 Land Management Plan are summarized in Table 237.

**Table 237. Summary of cumulative effects to lands and land uses from other resource management plans**

Resource plan	Description and summary of effects
Adjacent National Forest Plans	The forest plans for NFS lands adjacent to the HLC NF include the Custer-Gallatin, Lolo, Flathead, and Beaverhead-Deerlodge NFs. Management of vegetation is consistent across NFs due to law, regulation, and policy. The cumulative effect would be that lands and land uses management is consistent across these forests. This includes GAs that cross Forest boundaries, such as the Upper Blackfoot, Divide, Elkhorns, Crazies, and the Rocky Mountain Range.
Bureau of Land Management Resource Management Plans (RMP)	Bureau of Land Management lands near the HLC NF are managed by the Butte, Missoula, and Lewistown field offices. The Butte and Lewistown plans were recently revised, while the existing plans for the Missoula area is under revision. The Bureau of Land Management follows a screening and authorization process similar to the Forest Service for land special uses. The BLM plans would be complementary to the plan components for the HLC NF.

## Conclusions

Land adjustment activities would not vary in any of the alternatives, including alternative A. However, the action alternatives would include plan components that would provide additional direction for approval of land uses in riparian areas, and there could be differences in access needs by alternative.

By providing the plan components outlined in the action alternatives, the HLC NF meets the purpose and need of the Plan because there are no notable impacts to land adjustments, access, ownership or special uses which provide for multiple uses.

## 3.25 Infrastructure

### 3.25.1 Introduction

Broadly, the infrastructure on the HLC NF includes roads, trails, bridges, facilities, and dams. The programmatic effects analysis focuses on the transportation system. The transportation system for the HLC NF is defined as the system of NFS roads, NFS trails, and airfields on NFS lands (36 CFR 212.1). Please see the recreation and access section for discussion on access and effects to NFS trails and motorized over-snow vehicle use, as well as airfields.

The HLC NF expects to maintain an appropriately sized and environmentally sustainable road system that is responsive to ecological, economic, and social concerns. The NF road system of the future would continue to provide access for recreation and resource management, as well as support watershed restoration and resource protection to sustain healthy ecosystems.

Effects to the NF road system are measured by the miles of open road within RWAs.

### Analysis area

The geographic scope of the analysis includes NFS lands administered by the Forest. All lands within the Forest boundary form the geographic scope for cumulative effects. The temporal scope of the analysis is the life of the plan (15 years).

### Changes between draft and final

Minor additions were made to the analysis provided in the DEIS to clarify items brought up from public comment. Consideration and analysis of alternative F was also added to this section.

### 3.25.2 Regulatory Framework

**Federal Aid Highway Act of 1968, as amended** (23 U.S.C. 109(a) and (h), 144, 151, 319, and 351):

Establishes the National Bridge Inspection Standards (23 CFR Part 650, Subpart C) and the requirement that each state have a current inventory of bridges on all public roads, including NFS roads open to public travel (FSM 1535.11).

**Highway Safety Act of September 9, 1966** (Pub. L. 89-564, 80 Stat. 731, as amended): This act authorizes state and local governments and participating federal agencies to identify and survey accident locations; to design, construct, and maintain roads in accordance with safety standards; to apply sound traffic control principles and standards; and to promote pedestrian safety.

**Moving Ahead for Progress in the 21st-Century Act of July 6, 2012** (Pub. L. 112-141): Replaces the Federal Lands Highway Program with the Federal Lands Transportation Program and Federal Lands Access Program. This act authorizes funding for federal lands transportation facilities and federal lands access transportation facilities under a unified program with policy similar to federal-aid highways and other public transportation facilities. It requires federal land management agencies to identify a comprehensive inventory of public federal lands transportation facilities that, at a minimum, includes the transportation facilities that provide access to high-use federal recreation sites or federal economic generators.

**National Best Management Practices for Water Quality Management on National Forest System Lands, Volume 1: National Core BMP Technical Guide, April 2012**: The first volume of guidance for the FS, U.S. Department of Agriculture, and National Best Management Practices Program. The National BMP Program was developed to improve agency performance and accountability in managing water quality consistent with the Federal Clean Water Act and state water quality programs. Current FS policy directs compliance with required Federal Clean Water Act permits and state regulations and requires the use of National BMP Program to control nonpoint source pollution to meet applicable water quality standards and other Federal Clean Water Act requirements. It includes road management activity National BMP Program for construction, operation, and maintenance for roads and motorized trails.

**Surface Transportation Assistance Act of 1978** (Pub. L. 95-599, as amended). Supersedes the Forest Highway Act of 1958: Authorizes appropriations for forest highways and public lands highways. Establishes criteria for forest highways; defines forest roads, forest development roads, and forest development trails (referred to as “NFS roads” and “NFS trails” in FS regulations and directives); and limits the size of projects performed by FS employees on forest roads. Establishes the Federal Lands Highway Program.

**Term Permit Act of March 4, 1915** (Pub. L. 63-293, Ch. 144, 38 Stat. 1101, as amended; 16 U.S.C. 497): This act provides direction to the NFS lands to authorize occupancy for a wide variety of uses through permits not exceeding 30 years.

**The Fixing America’s Surface Transportation (FAST) Act (Pub. L. No. 114-94)**: Provides long-term funding certainty for surface transportation infrastructure planning and investment. The FAST Act authorizes \$305 billion over fiscal years 2016 through 2020 for highway, highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs. The FAST Act maintains our focus on safety, keeps intact the established structure of the various highway-related programs we manage, continues efforts to streamline project delivery and, for the first time, provides a dedicated source of federal dollars for freight projects. With the enactment of the FAST Act, states and local governments are now moving forward with critical transportation projects with the confidence that they will have a federal partner over the long term.

**Travel Management (36 CFR Part 212, Subparts A, B, and C)**. Subpart A of these regulations establishes requirements for administration of the forest transportation system, including roads, trails, and airfields, and contains provisions for acquisition of rights-of-way. Subpart A also requires identification of the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of NFS lands and use of a science-based roads analysis at the appropriate scale in determining the minimum road system. Subpart B describes the requirements for designating roads, trails, and areas for motor vehicle use and for identifying designated roads, trails, and areas on a motor vehicle use map (MVUM). Subpart C provides for regulation of use of over-snow vehicles on NFS roads, on NFS trails, and in areas on NFS lands.

### **3.25.3 Assumptions**

Due to the extensive evaluation of RWAs and the effort to identify areas with the least amount of infrastructure, facilities and bridges would be minimally impacted across all alternatives and therefore only motorized access will be compared between alternatives.

### **3.25.4 Best available scientific information used**

The FS uses the best available scientific information when implementing construction and maintenance activities. Please see the regulatory framework section for more information.

### **3.25.5 Affected environment**

#### **Forest system roads**

NFS roads are under the jurisdiction of the FS. They are wholly or partly within or adjacent to NFS lands. The FS determines the necessity of these roads for the protection, administration, and utilization of NFS lands and the use and development of its resources. Roads managed by public agencies (such as states, counties, and municipalities) that provide access to NFS lands are also informally considered part of the overall regional transportation system, but do not fall under the jurisdiction or direction of the NFS. These roads are not included in this evaluation.

In 2015 the Forest completed a travel analysis report. This broad-scale analysis encompassed all existing NFS roads on the Forest. The report provides an assessment of the road infrastructure and a set of findings and opportunities for change to the forest transportation system. This report provides information to forest managers regarding the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of NFS lands.

The travel analysis report is used by the Forest to prioritize maintenance needs and identify opportunities for decommissioning roads, or putting them in intermittent stored service as the Forest works to identify the minimum number of routes needed for an efficient transportation system as directed in 36 CFR 212 subpart A.

The travel analysis report identified NFS roads as “not likely needed for future use”. These roads may be considered candidates for conversion to another use, storage for future use, or removal through decommissioning. Other roads that were rated as “high risk” were identified as candidates for storage for future use, reconstruction or relocation, or additional road maintenance. Roads considered as “low risk” are the first to be considered for reduced road maintenance (i.e., change to a lower maintenance level).

Neither the travel analysis report nor the draft plan makes travel management decisions. Site-specific, project level analysis is required to make travel management decisions, including road closure, storage, or decommissioning.

NFS roads are designated by design (vehicle classifications and use) and maintenance standards for each road. Roads are generally constructed and maintained wide enough (>12 feet) for typical cars and trucks. Since many of the roads were initially constructed for vegetation management objectives, the design vehicles were lowboys or logging trucks. Roads are constructed to grades usually less than 12 percent to allow grade-ability for most highway vehicles. The FS uses five maintenance levels to define the general design standards, use, and associated type of maintenance required. These five maintenance levels are:

- Maintenance level 1. These are roads that have been placed in storage between intermittent uses. The period of storage must exceed one year. Basic custodial maintenance is performed to prevent damage to adjacent resources and to perpetuate the road for future resource management needs. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur. Roads managed at this maintenance level are in basic custodial care.
- Maintenance level 2. These roads are open for use by high clearance vehicles. Passenger car traffic, user comfort, and user convenience are not considerations. Warning signs and traffic control devices are generally not provided. Motorists should have no expectations of being alerted to potential hazards while driving these roads. Traffic is normally minor, usually consisting of one or more of a combination of administrative, permitted, dispersed recreation, or other specialized uses. Roads managed at this maintenance level are described as high clearance vehicle roads.
- Maintenance level 3. These roads are open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not priorities. Roads in this maintenance level are typically low speed with single lanes and turnouts and are included in the term “passenger car” roads. These roads are maintained for travel by a prudent driver in a standard passenger car.
- Maintenance level 4. These roads provide a moderate degree of user comfort and convenience at slow to moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated. Maintenance level 4 roads are collectively maintained for travel by a prudent driver in a standard passenger car.
- Maintenance level 5. These roads provide a high level of user comfort and convenience at slow to moderate travel speeds. The roads are normally double lane, paved facilities. Some may be aggregate surfaced and dust abated. Maintenance level 5 roads are collectively maintained for travel by a prudent driver in a standard passenger car.

These roads fall under the requirements of the National Highway Safety Act and the Manual of Uniform Traffic Control Devices. Warning signs and traffic control devices are provided to alert motorists of situations that may violate expectations.

Forestwide, there are approximately 2,569 miles of road that are open for public use either seasonally or year-round. Roughly 1,593 miles of these roads are open for high clearance vehicles and 976 miles are open for passenger cars. Additionally, there are 1,082 miles of NFS roads within the planning area that are currently in custodial care (closed to public motorized use).

Table 238 provides information related to the distribution of roads by maintenance level and GAs within the planning area. Some roads under the jurisdiction of the FS fall outside of the GA boundaries. These roads are owned and/or maintained by the FS on private lands, have easements in place with private landowners, or are situations where necessary easements are being pursued by the FS.

**Table 238. Miles of NFS roads by maintenance level**

Geographic Area	ML 1	ML 2	ML 3	ML 4	ML 5	Total
Outside GA <sup>1</sup>	21	33	69	37	3	163
Big Belts	333	205	142	26	0	706
Castles	3	50	21	3	0	77
Crazies	7	26	11	0	0	44
Divide	216	201	97	38	1	553
Elkhorns	114	123	35	15	0	287
Highwoods	1	9	2	0	0	12
Little Belts	166	562	235	58	0	1021
Rocky Mountain Range	14	53	33	26	8	134
Snowies	14	48	16	1	6	85
Upper Blackfoot	193	283	86	9	1	572
Total Miles	1,082	1,593	747	213	19	3,651

<sup>1</sup>Areas where roads under NF jurisdiction are not located in NFS land.

The total number of miles of NFS roads within the planning area has steadily been declining over the past ten years. Miles of road decommissioning has become an assigned accomplishment target.

### Road maintenance practices and policies

The maintenance level of roads, as well as the amount of attention the roads receive annually, varies widely. Some of the roads are in poor locations, which increases maintenance needs and the risk that sediment from the road surface could enter the adjacent streams. The FS works to prioritize road maintenance in annual maintenance plans. These plans are based on projected budgets, the amount of traffic individual roads receive, and damage created by environmental factors such as flooding and erosion.

Routine road and bridge maintenance work (brushing, blading, ditch, culvert cleaning, deck cleaning, etc.) is periodically performed on approximately 2,500 miles of maintenance level 2, 3, 4, and 5 roads as funding allows and in most cases they are kept in a drivable condition for their designed use. There are approximately 1,100 miles in maintenance level 1 (which includes roads treated for intermittent stored service). However, they do not receive routine maintenance work.

Table 239 provides a summary of the road maintenance accomplishments from 2016 and 2019. The decommissioning of not needed roads for specific resource concerns has averaged between 20-50 miles annually for the last four years and is expected to continue as funding allows.

**Table 239. 2016-2019 road maintenance accomplishments (miles)**

Accomplishment Item		FY 2016	FY 2017	FY 2018	FY 2019
Road Maintenance	High clearance roads	29	40	12	61
	Passenger car roads	85	252	155	117
Road Reconstruction/Improvements	High clearance roads	6	15	0	0
	Passenger car roads	0	13	0	1



## Administrative facilities

The management of buildings and other structures is held under FSM 7310. Forests are mandated to develop a facilities master plan as a guide to facilities planning. These documents are continuously updated.

Administrative facilities are typically buildings and their appurtenances necessary to support the employees, equipment, and activities necessary for the management of the NFs. These are commonly called fire, administrative, and other. Administrative facilities are separate from recreation facilities. Administrative facilities include fire stations, offices, warehouses, and shops as well as living quarters such as barrack and individual residences. Living quarters are partially supported by rental receipts, while administrative and other facilities are financially supported through annual budget appropriations.

There are two supervisor offices which serve the HLC NF planning area; one is located in Helena, MT and the other one is located in Great Falls, MT. Both of these administrated offices are leased facilities. There are eight ranger district offices dispersed throughout the forests as well as the Lewis and Clark Interpretive Center and the Augusta Information Station. The Helena Ranger District, which is co-located with the Helena NF Supervisor's Office and the Townsend Ranger District Office and Warehouse, the Judith Ranger Station, the Musselshell Ranger District, the Rocky Mountain Ranger District and Augusta Information Station are leased facilities. The Lincoln Ranger District, Belt Creek Ranger District, White Sulfur Spring Ranger District, and the Lewis and Clark Interpretive Center are NFS facilities.

There are approximately 245 FS-owned fire administrative and operations buildings. The rehabilitation or replacement of existing forest facilities that do not meet current operational standards and the disposal of those facilities that are considered surplus to the forest operational needs is a focus for the Forest program. There are actions underway to remove these facilities from the forest and from the inventory. There are approximately 20 structures that have been identified as excess across the HLC NF.

## Road bridges

There are approximately 138 road bridges under the jurisdiction of the FS within the HLC NF planning area. The majority of these structures meet or exceed the minimum criteria for bridge condition. Approximately 11 are at an intolerable or minimum tolerable limit for condition.

FS policy requires two-year inspections on every bridge under FS jurisdiction. Bridges must be repaired and replaced with road maintenance funding, with a small number of structures being replaced through the capital investment program.

Many bridges within the planning area were constructed to support the timber program and are over 30 years old. Older bridges were often built with the abutments at the very edge of streams and often encroach on the stream and are no longer in compliance with BMPs. Table 240 describes the number of bridges within the planning area, the GA in which they are located, and information concerning the condition of these structures.

**Table 240. Road bridge location and condition in the HLC NF planning area**

GA	Intolerable: requires high priority replacement	Meets minimum tolerable limit	Somewhat better than minimum adequacy	Equal to minimum criteria	Better than minimum criteria	Equal to desirable criteria	Superior to desirable criteria	Totals
Big Belts			1	4	1	7		13
Castles			2		1			3
Crazies				3	1			4
Divide		1	1	4	3	4		13

GA	Intolerable: requires high priority replacement	Meets minimum tolerable limit	Somewhat better than minimum adequacy	Equal to minimum criteria	Better than minimum criteria	Equal to desirable criteria	Superior to desirable criteria	Totals
Elkhorns				1	1	3		5
Highwoods		1	1	1	1	2		6
Little Belts	1	6	13	16	5	5		46
Rocky Mountain		2	5	2	11	2		22
Snowies			1	2				3
Upper Blackfoot			2	4	9	6	2	23
Totals	1	10	26	37	33	29	2	138

### Facilities, Dams

There are six dams in the HLC NF planning area that have been identified by the infrastructure database. These dams are inspected by the FS or by private contractor. Table 241 shows the list of dams that are located within the HLC NF planning area. The records for these dams are held at the supervisor's office and in the infrastructure database. These dams are maintained and operated by the FS, the City of Helena, or private entities. The Teague dam is privately owned and located in the Big Belt GA. This dam has not been inspected recently because it falls below the FS capacity requirements of retaining greater than 13 acre-feet of water.

**Table 241. Dams by GA**

GA	Dam name	Operation condition	Owner/operator	Hazard classification
Big Belts	Gipsy Lake Dam	Limited Operations	FS	Low
Big Belts	Teague	Fully Operational	Private	Low (<12 acre feet)
Divide	Chessman Dam	Fully Operational	City of Helena	Medium
Divide	Park Lake Dam	Fully Operational	FS	High
Rocky Mountain	Wood Lake Dam	Fully Operational	FS	Low
Upper Blackfoot	Mike Horse Dam	Fully Operational	FS	Low

The following information about these dams shows the relative condition of each of them. More specific information is located in the infrastructure database and in files at district offices:

- Gipsy Lake Dam is in poor condition with an under designed spillway and substantial vegetation growing over 100% of the structure. There is substantial leakage around the outlet works.
- Teague Dam is a private dam that holds back less than 13 acre-feet.
- Park Lake dam is in very good condition, having been recently rebuilt. There is an early warning system in place for this structure.
- Chessman Dam, located within the Divide GA, is operated by the City of Helena.
- Park Lake Dam has an early warning system in place which is inspected and monitored by a private engineering firm located in Helena.
- Wood Lake Dam is in good condition with maintenance required on the gate controls and brushing of the embankments needed.
- Mike Horse Dam holds back mine tailings and will be removed as soon as the tailings are removed from behind the dam.

### 3.25.6 Environmental consequences

#### Effects common to all alternatives

Road, bridge, and facility maintenance (both recurrent and deferred) would continue to occur, as funding allows. Physical conditions would continue to be addressed through maintenance activities and be based on public health and safety, resource protection, and mission priorities. Annual operating budgets and supplemental funding would likely fluctuate, resulting in varying maintenance accomplishments from year to year. The potential impacts to the road system from climate change are uncertain in timing and magnitude, and that plan components are in place to allow for appropriate responses. Please see the carbon and climate section for more information.

The drivability of maintenance level 1 roads can be expected to continue to diminish as roads revegetate.

#### *Effects from forest plan components associated with:*

##### **Fire and fuels management**

Fuels management activities (e.g., prescribed burning) and fire suppression actions are likely to continue under all alternatives. Administrative use of gated roads that normally prohibit motor vehicle use yearlong is likely when these management activities occur.

Fire suppression actions are also likely to continue and could result in the use of gated roads. In some cases, roads in storage (maintenance level 1) that are impassible to motor vehicle use (due to revegetation or other restrictive condition) may be opened to facilitate suppression actions. These roads would probably be used for the duration of suppression efforts and post-fire work then returned to their previous status. Bridge load ratings are required for all road bridges and due to the age of many of the bridges, may limit the capacity of the bridge, requiring overload permits for the equipment used for fire suppression activities.

##### **Wildlife habitat management**

Habitat security requirements and other mitigation measures for grizzly bear can be expected to affect motorized access under all alternatives. Where roads and the access they provide are necessary, limitations on road construction and operating seasons can be expected to affect public access. Areas most affected would be bear management units in the Northern Continental Divide Ecosystem primary conservation area. The standards and guidelines from the 2018 Forest Plan Amendments to Incorporate Habitat Management Direction for the Northern Continental Divide Ecosystem Grizzly Bear Population would be retained in all alternatives.

##### **Minerals management**

The FS does not initiate exploration or development of mineral or energy resources. Proposals for exploration and development are regulated by existing mining law. Access and road development (long-term or temporary) are often associated with mineral exploration and development, but a site-specific analysis would be required prior to any approval for exploration or development activities.

If any mine reclamation activities occur, they would likely, but not always, use existing roads. These may be roads that are not currently designated for motor vehicle use. They would likely be used for the duration of the reclamation work and then returned to their previous status. New roads, trails or other types of access may be approved for a proposed mining operation as long as the proposal is incident to mining and within the scope of the next logical phase of mining development and subject to a site-specific analysis.

##### **Aquatic ecosystems management**

Watershed improvement activities are likely to continue under all alternatives. The consequences to motor vehicle access to implement watershed improvements are expected to be minimal. Activity that would occur on roads that are generally not designated for motor vehicle use are treatments to reduce sediment production

and transport sediment to surface waters or to provide for aquatic organism passage. Actions taken might include culvert removal, out-sloping of road prisms, or the removal of unstable fills.

Watershed treatments would continue to be completed on roads that are designated for motor vehicle use and may result in traffic delays or temporary road closure of open roads while construction occurs.

### Effects common to all action alternatives

Table 242 describes the effects common to all action alternatives, based on plan components.

**Table 242. Summary of plan components and their effects to infrastructure**

Plan component	Expected effects
FW-WTR-GDL-02	Installation of drainage features would increase the stability of the road and reduce its deterioration for long-term storage.
FW-CWN-OBJ-01	Repairing stream crossings would protect the road and avoid future road failure during high water event.
FW-CWN-GDL-02	Due to limited funding allocations for road maintenance, prioritizing road maintenance and obliteration to travel routes that directly affect streams verses roads that are ecologically disconnected from streams, may result in roads with higher public use not receiving road maintenance, reducing their drivability.
FW-RMZ-GDL-04 & FW-RMZ-STD-01	Avoiding construction of roads in RMZs may reduce access or increase cost of construction.
FW-VEGT-GDL-01	User safety and facility protection need to be considered when limiting vegetation removal.
FW-WL-GDL-10	Due to high deferred maintenance costs and national direction to reduce excess infrastructure, removal of buildings housing bats may be necessary and mitigation measures may be required.
FW-RECWILD-SUIT-08-09, FW-WSA-GDL-05-06	New administration facilities may be required for management activities due to travel time.
FW-CR-DC-02	Maintaining cultural and historic characteristics of existing buildings may result in increased costs for building materials and the use of less maintenance free products.
FW-RT-OBJ-01-03	The number of miles decommissioned, maintained, reconstructed or improved varies on available funding and the number vegetation management projects contributing to road management activities.
FW-RT-STD-02	Requiring all new, reconstructed and replaced crossings to meet the 100-year flow event would increase the cost and limit the number completed each year but provide increased road protection during high water events.
FW-RT-GDL-01	May reduce access or increase cost of construction.
FW-RT-GDL-02 & 04	Installation of drainage features would increase the stability of the road and reduce its deterioration for long-term storage.
FW-RT-GDL-05 & 07	Not locating roads on lands with high mass wasting potential or wetlands and unsuitable areas would increase the stability and longevity of the road but may result in increased construction costs to avoid those areas.
FW-RT-GDL-10	Requiring annual operating plans on all new, reconstructed and replaced crossings in fish bearing streams would increase the cost and limit the number completed each year but provide increased road protection during high water events.
FW-BRDGE-DC-01, 02	These DCs would ensure that bridges and culverts are managed to provide safe access while protecting natural and cultural resources and providing for aquatic organism passage.
FW-BRDG-GDL-01	No effect.

Plan component	Expected effects
DI-FAH-STD-01	Requiring all new crossings to meet the 100-year flow event would increase the cost and limit the number completed each year but provide increased road protection during high water events.

*Effects of plan components associated with:*

**Aquatic ecosystems management**

Under all action alternatives, FW-RMZ-STD-01, delineating the size of riparian areas, would now limit road construction activities according to Categories 1-4, on both sides of the Continental Divide, which may result in reduced access and/or increased construction costs.

There are numerous plan components in infrastructure (FW-RT-STD-01 through 04; FW-RT-GDL-01 through 12) that are designed to minimize sediment from roads to waterbodies. Generally, these plan components would not affect the public use of roads except for decommissioned roads which would be more difficult to travel on but would improve road conditions through proper BMPs and maintenance.

**Alternative A, no action**

The no-action alternative is represented by the existing 1986 Forest Plans, as amended (see Table 243). There are three RWAs in this alternative, where mechanized means of transport and limited motorized uses are suitable. About 4.0 miles of open roads that are currently within the RWAs, within the Big Belts and Divide GA, would continue to be used as open motorized routes.

Under the no-action alternative, the 1986 Forest Plans would continue to apply national BMPs and west of the continental divide directions from INFISH would be carried forward. The 1986 Forest Plans were developed to provide guidance and objectives to build the infrastructure that was needed to support land management activities for the future and those objectives have been achieved and continued growth in infrastructure is no longer needed at the rate laid out in the 1986 plans.

**Table 243. Summary of 1986 Plan components and their effects to infrastructure**

Plan component	Expected effects
Facilities, Objective Lewis and Clark NF	Increasing the existing road system by an average 17 miles/year for the next 50 years is not sustainable or needed.
Facilities, Objective Helena NF	Increasing the existing road system by an average 22 miles/year over the next decade is not sustainable or needed.
Facilities, Road Standard 3	Not locating roads, trails and other linear features on lands with high mass wasting potential would increase the stability and longevity of the roads but may result in increased construction costs to avoid those areas.
INFISH RF-2f	Requires minimizing side casting into or adjacent to waterbodies when blading roads and plowing snow. This only applies to INFISH priority watersheds. No effect.
INFISH RF-4	Requires installation of a 100-year crossing structure where “a substantial risk to riparian conditions” may exist. This is less stringent than the plan component which requires all new, reconstructed and replaced crossings to meet the 100-year flow event.

**Effects that vary by alternative**

Alternative B was scoped as the proposed action and contains nine RWAs. Motorized and mechanized means of transport in RWAs would not be suitable. About 13.6 miles of open roads that are currently within the RWA, the Snowies GA would need to be removed from the system after site-specific analysis. In addition, about 57 miles of closed roads (maintenance level 1) that are currently within the RWAs would need to be removed from the system after site-specific analysis.

Under alternative C, the RWAs are the same as alternative B, but existing motorized and mechanized means of transport would be suitable. About 13.6 miles of open roads that are currently within the RWA, within the Snowies GA, would continue to be used as open motorized routes.

Alternative D represents more undeveloped recreation areas, has the greatest number of RWAs, and includes the least amount of lands suitable for timber production. Motorized and mechanized means of transport in RWAs would not be suitable. About 23 miles of open roads that are currently within the RWAs, within the Big Belts, Castles, Little Belts, Snowies and Divide GA, would need to be removed from the system after site-specific analysis. In addition, about 130 miles of closed roads (maintenance level 1) that are currently within the RWAs would need to be removed from the system after site-specific analysis.

Alternative E represents the most motorized use on NFS lands and would require no removal of open roads as a result of not identifying RWAs.

Alternative F is the preferred alternative. There are seven RWAs in this alternative. Motorized and mechanized means of transport in RWAs would not be suitable. About 13.6 miles of open roads that are currently within the RWA, in the Snowies GA, would need to be removed from the system after site-specific analysis. In addition, about 23 miles of closed roads (maintenance level 1) that are currently within the RWAs would need to be removed from the system after site-specific analysis.

#### *Effects from forest plan components associated with:*

##### **Vegetation management**

Commercial timber harvest activities would generally result in road maintenance, reconstruction and continued application of BMPs on existing NFS roads. New road construction is likely to be limited and temporary road construction used as a more common method for short-term access needs.

Administrative use of gated roads that normally prohibit motor vehicle use yearlong would be likely when management activities such as precommercial thinning, invasive weed treatments, or other noncommercial silvicultural treatments are planned.

Bridge load ratings are required for all road bridges and due to the age of many of the bridges and may limit the capacity of the bridge, requiring overload permits for the equipment used for commercial timber harvest activities.

Alternative E would generally be expected to result in the least amount of vegetation management activities and result in a lower amount of road use compared (respectively) to alternatives A, B, C, D and F. Consequently, reduced traffic (i.e., number of vehicles on roads), both commercial and administrative, can be expected for alternative E. Associated with reduced commercial use is the reduction of road reconstruction to standard and BMPs work. Road and bridge maintenance activities done in conjunction with commercial use would also occur less often since this work is only required commensurate with use.

##### **Cumulative effects**

The Forest is likely to be influenced by a variety of factors. Given the mixed land ownership (state lands, corporate timberlands) in and around the Forest, and the continuing management actions taken on these lands, there may be options for new access opportunities through cooperative and cost-share agreements.

Commercial traffic (timber hauling) can be expected to fluctuate to some degree, relative to vegetation management activities. Market conditions and other external factors can often influence activity levels. These traffic conditions are usually limited to relatively small GAs and short periods of time. Hauling occurs more often during the summer months but is not uncommon during the winter months as well.

Change in ownership of private lands can result in continued requests for road access across NFS lands. Depending on the circumstances, these may be requests for forest or private road special use authorization.

Depending on the terms and conditions written into any new authorizations, opportunities for access to NFS lands may be created.

State and local government agencies with road management authority can be expected to continue to maintain their existing road network across the Forest. Some changes such as widening, resurfacing, and bridge replacements are probable but are dependent on budgets and funding allocations. The likelihood of jurisdiction of NFS roads being passed to other public road agencies is low.

Some adjacent lands are subject to their own management plans. The cumulative effects of these plans in conjunction with the 2021 Land Management Plan are summarized in Table 244, for those plans applicable to roads and bridges.

**Table 244. Summary of cumulative effects to infrastructure from other resource management plans**

Resource plan	Summary of effects
Blackfeet Wildland Fire Mgt. Plan (2018)	This resource did not affect nor was affected by infrastructure section of the plan.
Forest Plans of Adjacent National Forests	The Flathead, Lolo, Beaverhead-Deerlodge, and Custer-Gallatin NFs are adjacent to the HLC NF and share boundaries on specific GAs (Rocky Mountain Range, Upper Blackfoot, Divide, Elkhorns, and Crazyes). The Flathead and Custer-Gallatin are currently in forest plan revision under the 2012 Planning Rule. The Beaverhead-Deerlodge is guided by a recent forest plan (2009) developed under the 1982 rule. The Lolo is guided by a 1986 forest plan and is expected to undergo revision relatively soon. Generally speaking, management of infrastructure is consistent across NFs due to consistency in law, regulation, and policy. The management of the specific areas that are adjacent would be complementary across boundaries.
BLM Resource Management Plans	The Butte, Missoula, and Lewistown field offices manage lands that are intermixed with the HLC NF. The Missoula area is currently in revision. The Butte and Lewistown areas are guided by recent plans (2009 and 2019 respectively). At a broad scale, the themes of the plans are similar to the HLC NF; infrastructure would be generally be managed in a similar manner and with similar results.
National Park Service - Glacier National Park Plans	These resources did not affect nor were they affected by infrastructure section of the plan.
Montana Army National Guard – Integrated Natural Resources Management Plan for the Limestone Hills Training Area 2014	This resource did not affect nor was affected by infrastructure section of the plan.
Montana State Parks and Recreation Strategic Plan 2015-2020	This resource did not affect nor was affected by infrastructure section of the plan.
Montana’s State Action Plans	These resources did not affect nor were they affected by infrastructure section of the plan.
County wildfire protection plans	These resources did not affect nor were they affected by infrastructure section of the plan.
City of Helena Montana Parks, Recreation and Open Space Plan (2010)	This resource did not affect nor was affected by infrastructure section of the plan.
County Growth Plans	Many of the county growth plans associated with the HLC NF planning area emphasize an interest in recreational uses and access, water quality and wildfire protection which are consistent with the infrastructure plan components.

## Conclusions

Under the no-action alternative, the 1986 Forest Plans would continue to apply national BMPs. West of the continental divide, directions from INFISH would be carried forward. In all action alternatives, plan components developed to support and improve watershed and aquatic management areas, including creation of RMZs, which would increase the GA where road construction limitations are applied. This change would likely result in a decrease in possible motorized access in those areas and an increase in construction costs to avoid RMZs.

RWAs would have a direct effect on motorized use across the GAs and would vary across all action alternatives as well as the no-action alternative. Alternative D proposes the most RWAs and contains the most open road within those areas followed by alternatives F, B, C, A and E where there are no RWAs and therefore no effect to open roads. In all alternatives, the total number of miles of open road that would be affected by RWAs would be minor compared to the total number of miles of open roads across the Forest.

Road, bridge and facility maintenance (both recurrent and deferred) would continue to occur, as funding allows. Physical conditions would continue to be addressed through maintenance activities and be based on public health and safety, resource protection, and mission priorities. Road and bridge maintenance would continue under all alternatives, but maintenance activities would tend to be greater in the alternatives that allow for more commercial timber harvest activities, alternatives D, C, B, F, A and E respectively.

Plan components in the draft plan that would require all new, reconstructed and replaced crossings to meet the 100-year flow event would increase the cost and limit the number completed each year but would provide increased road protection during high water events.

Under all alternatives, administration facilities would continue to be repaired or replaced to meet current operational standards. They would be disposed of if they are considered surplus to the forest operational needs. Action plan components that maintain cultural and historic characteristics of existing buildings may result in increased costs for building materials and the use of less maintenance free products.

Under all alternatives, the FS would continue to maintain dams in working condition and would continue to work with other agencies regarding their operations. The FS would continue to inspect these structures in compliance with the designated frequency.

## 3.26 Social and Economics

### 3.26.1 Introduction

The mission of the FS is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations. The HLC NFS lands both influence, and are influenced by, local and national publics. Local communities, particularly those adjacent to NFS lands, benefit from a multitude of goods and services provided by the Forest and the FS. These societal benefits are often referred to as ecosystem services, which are defined "as goods and services provided wholly or in part by ecosystems and that are of value to people" (Olander et al., 2015). The Forest's ecosystem services, alongside infrastructure and operations, are the main ways that public lands contribute to social and economic sustainability. Many local communities were formed based on availability of roads and ecosystem goods and services such as timber, minerals, grazing lands, and other natural resources. Historically, individuals in these communities have benefited from a host of services such as recreation, scenery, employment and opportunities to connect with nature. The general public across the U.S. also benefit from the HLC NF. The key benefits the Forest and the FS provide include: recreation, income, jobs, scenery, clean water, cultural, historic and tribal resources, designated areas (e.g. wilderness), fire suppression, fish and wildlife, grazing, infrastructure, timber, other forest products and wood for fuel, energy and minerals, public information, interpretation and education and carbon storage and sequestration.



The 2012 Planning Rule states that plans are to guide management so that forests and grasslands contribute to social and economic sustainability, providing communities with ecosystem services and multiple uses that deliver a range of social, economic, and ecological benefits in the present and into the future. Specifically, plan components must include standards or guidelines to guide the planning area's contribution to social and economic sustainability, taking into account ecosystem services as well as multiple uses that contribute to local, regional, and national economies and communities in a sustainable manner. Furthermore, reasonably foreseeable risks to societal benefits shall be considered when developing the forest plan.

This section, therefore, (1) describes the social and economic conditions of the affected environment using key indicators of social and economic sustainability; (2) describes how key benefits of the Forest currently contribute to social and economic sustainability of beneficiaries, both locally and at a broader scale (3) evaluates the impacts of the forest plan and alternatives on the benefits the Forest provides to local beneficiaries and the general public.

The Assessment identified an analysis area for the social analysis of 13 primary area counties and seven secondary areas counties. The factors for determining the social analysis area include recreational visitation, travel corridors, and social and cultural identity. The counties in which the HLC NF is located and that meet most of these factors are considered "primary analysis area counties", or primary areas. The counties that do not meet most of these factors and do not contain HLC NFS land are considered "secondary analysis area counties", or secondary areas.

The 13 primary counties are grouped into four areas:

- West: Broadwater, Jefferson, Lewis and Clark, Powell Counties
- North: Glacier, Pondera, Teton Counties
- Central: Cascade, Chouteau Counties
- East: Meagher, Judith Basin, Wheatland, Fergus Counties

Secondary area counties include:

- Missoula County
- Deerlodge County
- Gallatin and Park Counties
- Golden Valley and Sweet Grass Counties
- Yellowstone County

It is important to note that the social area of influence is distinct from the economic area of influence. Each GA is defined by a separate methodology. In the case of the economic area of influence for the HLC NF, there are 16 counties.

Ordered by population from highest to lowest, these 16 counties include: Gallatin, Cascade, Lewis and Clark, Park, Glacier, Jefferson, Fergus, Deer Lodge, Powell, Pondera, Teton, Chouteau, Broadwater, Wheatland, Judith Basin, and Meagher County. A visual display of these adjacent and overlapping areas is provided below in Figure 26. Details on the selection process for counties is found in appendix B.

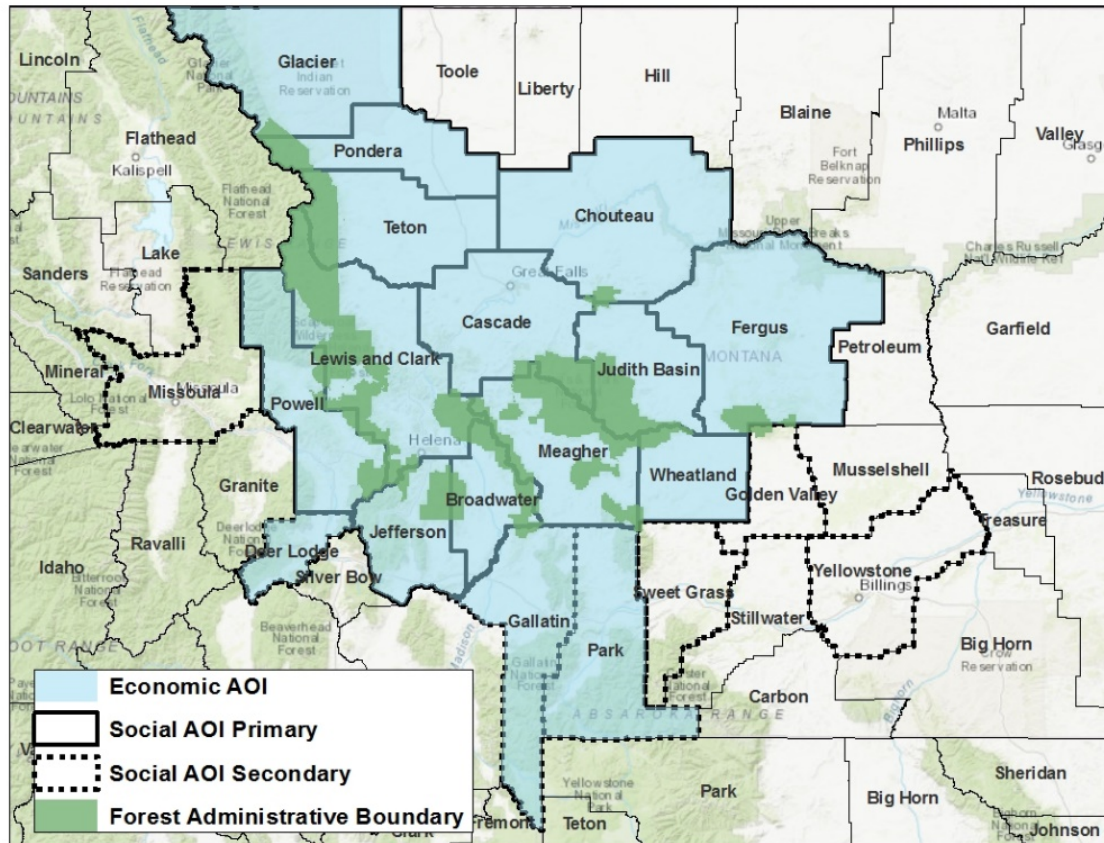


Figure 26. Map of the economic and social areas of influence for the HLC NF

## Key indicators

### *Economic conditions*

The economic conditions of the area of influence are assessed using the following indicators: employment (jobs and unemployment levels), income (labor and nonlabor), Federal Land payments, and economic diversification. Existing conditions are accessed through the Economic Profile System – Human Dimensions Toolkit (EPS-HDT) (<http://headwaterseconomics.org/tools/eps-hdt>), and report data are sourced from the U.S. Department of Commerce, and other Federal sources.

### *Social conditions*

The social conditions of the area of influence are assessed using the following indicators: demographic characteristics and trends (population size, change and composition), land ownership and development patterns, percent of land within the WUI, and county health levels. County health rankings data are sourced from the Population Health Institute at University of Wisconsin. For an in-depth description of health metrics, please see the Assessment. Population, land ownership and WUI data are provided by the Economic Profile System – Human Dimensions Toolkit.

### *Societal benefits*

The indicators of contributions to social and economic sustainability are the key societal benefits the Forest provides to beneficiaries. These societal benefits contribute to the social and economic sustainability of the area of influence (i.e. affected communities and beneficiaries) by enhancing the quality of life of the public. Quality of life is defined as the general level of wellbeing of individuals and society. The concept of quality of

life encompasses all aspects of life including employment and health. For the purposes of this analysis, income, jobs, health, safety and well-being are often discussed separately to emphasize the specific ways the Forest enhances quality of life.

The Forest benefits include ecosystem services, multiple uses, infrastructure and contributions from management operations such as educational programs and fire suppression. The key benefits were identified through interdisciplinary discussions with Forest staff and comments from the public.

The key benefits to society provided by the forest include:

- Carbon storage and sequestration
- Clean water
- Cultural, historic, and tribal resources (including spiritual experiences and nonuse values)
- Designated areas (including solitude, inspiration, nonuse values and research)
- Direct income and jobs
- Energy and minerals
- Fire suppression (and mitigation)
- Fish and wildlife (including nonuse values)
- Grazing (including nonuse values)
- Ecosystem integrity (including erosion control, flood protection, and nonuse values)
- Infrastructure
- Other forest products and wood for fuel
- Other income and jobs
- Public information, interpretation, and education
- Recreation (including solitude, spiritual experiences, and inspiration)
- Scenery (including aesthetics and nonuse values)
- Timber

### Changes between draft and final

There were no substantial changes between the draft and final social sustainability analysis, aside from the inclusion of Alt F in the effect analysis.

The economic contribution model was updated in this FEIS to include Alt F, and additionally, some of the input data for the economic model was updated, mainly the wood sale quantity estimates which are further discussed in the Timber section.

### ***3.26.2 Regulatory framework***

The following is a select set of statutory authorities that govern the evaluation of social and economic resources in the planning area. There are multiple other laws, regulations, and policies - including those at the beginning of chapter three - that also guide the management of this resource.

**Executive Order No. 12898 on Environmental Justice** (issued February 11, 1994): Mandates federal agencies to make achieving environmental justice part of their mission. This includes identification and response to disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.

**National Forest Revenue Act** (amended 1908): Requires 25 percent of revenues generated by NFS lands to be paid to the States for use by the counties in which the lands are situated for the benefit of public schools and roads.

**Office of Management and Budget Circular A-116** (issued August 16, 1978): Requires executive branch agencies to conduct long range planning and impact analysis associated with major initiatives.

### ***3.26.3 Assumptions***

This analysis assumes that social conditions in the planning area will continue to follow observed trends. Population trends are expected to follow a similar trajectory as observed between 2000 and 2010.

### ***3.26.4 Best available scientific information used***

Data describing the social environment are taken from the Assessment. Data for the Assessment were “gathered in large part from perusal of Chambers of Commerce webpages, county planning documents, economic development groups and the like”. Demographic data are sourced from government entities through the Economic Profile System – Human Dimensions Toolkit. This data platform harmonizes data from the Bureau of Economic Analysis, the Bureau of Labor Statistics, and the US Census Bureau. The 2012 Planning Rule directs analysis to be conducted based on preexisting information and does not encourage the collection of new, primary data to assess social conditions. Given these data constraints, the data used in the analysis of the social environment are the best available.

Data available for analysis of economic impacts are provided through the latest version of IMPLAN software, owned and sold by MIG, Incorporated. Data accessed through IMPLAN software originates from county business patterns of the U.S. Census bureau, and other Federal sources.

### ***3.26.5 Affected environment***

#### **Social Conditions**

Note: WUI in the social conditions analysis is identified using Headwaters Economic data. For this analysis, WUI is defined by Headwaters Economics as private forestlands that are within 500 meters of public forestlands. This differs from how WUI is defined in the Plan.

#### ***West county group***

#### **Population dynamics**

The West area is comprised of Broadwater, Jefferson, Lewis and Clark and Powell Counties. This area experienced notable population growth between 2000 and 2012, a 13 percent increase. Broadwater County experienced the most notable growth, a 27 percent increase. Powell County was the exception, losing almost 2 percent of its population during the same 2000 to 2012 period. The substantial rise in population indicates increased demand for the benefits the Forest provide as well as increased stresses on vulnerable resources. Domestic migration was the main driver of population change between 2000 and 2012, with notably more Americans moving into the West area counties than exiting. The population in the West area is slightly older than that of Montana as a whole, with median ages in the four counties ranging from 41 to 47 (compared to 39 for Montana). The population in the West area is also aging. Between 2000 and 2012, all four West area counties experienced a rise in median age, between 7 and 16 percent. This suggests that more residents may be entering retirement in the coming decades. In 2012, those aged 50 to 60 comprised the largest proportion of the West area population.

Health outcomes in the West area, as measured by the County Health Rankings composite indicator, vary by county. Broadwater, Jefferson and Lewis and Clark Counties ranked in the top half of all counties in Montana

for overall health outcomes. Powell County ranked in the bottom half, indicating that overall health outcomes in Powell County are below the Montana county average.

### **Land ownership, development patterns, and wildland-urban interface**

Almost half of all lands in the West area, 42.5 percent, are NFS lands. Thus, these four counties are heavily impacted by FS land management decisions, particularly in terms of areas available for development. Land use is also relevant as development of private lands can influence adjacent, NFS lands. Impacts to wildlife habitat and increased recreational use are primary considerations. Residential acreage in the West area increased by 58 percent between 2000 and 2010, a substantial change. Land area (mi<sup>2</sup>) in the wildland-urban interface (defined by Headwaters Economics as private forestlands that are within 500 meters of public forestlands), comprises 404 mi<sup>2</sup> of the West area. Only 5 percent of this area contains homes. This suggests that while residential acreage is increasing, residential development is occurring primarily outside of the WUI.

#### *North county group*

##### **Population dynamics**

The North area is comprised of Glacier, Pondera and Teton Counties. This area experienced a slight loss in population between 2000 and 2012, a 2 percent decrease. Teton County experienced the most notable loss, a 6 percent decrease. Glacier County had a slight uptick in population, with an increase of 1 percent. Domestic outmigration was the main driver of population change between 2000 and 2012, with substantially more Americans moving out of the North area counties than moving in. This could indicate a lack of economic opportunity in the area which is driving residents to seek employment elsewhere. The populations in Pondera and Teton Counties, similar to West area counties, are relatively older than the state average, with median ages of 43 and 46, respectively. Conversely, the Glacier County population is relatively younger, with a median age of 31 in 2012.

Health outcomes in the North area, as measured by the County Health Rankings composite indicator, vary by county. All three counties in the area ranked in the bottom half of all Montana counties, indicating that overall health and access to health services are below most other counties in the state.

### **Land ownership, development patterns, and wildland-urban interface**

Only 8 percent of all lands in the North area are owned by the FS. There is substantial variation in NFS land ownership by county. Teton County has the greatest percentage of total area under FS management, at 16 percent. Glacier County has the least, with only 2 percent. The National Park Service has a considerably larger stake in Glacier County, managing 19 percent of the area in Glacier County. Tribal lands comprise the most notable portion of Glacier County land, at 71 percent. 35 percent of all lands in the North are under tribal ownership, considerably more than in Montana overall. Considering the extent of tribal land ownership, NFS land management decisions are likely particularly relevant to tribal governments in the North area.

Residential acreage in the North area increased by 19 percent between 2000 and 2010. Teton County experienced the greatest change, with an increase of 24 percent. Land area (mi<sup>2</sup>) in the wildland-urban interface comprises 21 mi<sup>2</sup> of the North area. Only 3 percent of this area contains homes. The North area has considerably fewer homes in the WUI, compared to Montana overall.

#### *Central county group*

##### **Population dynamics**

The Central area is comprised of Cascade and Chouteau Counties. While Cascade County experienced a slight increase in population between 2000 and 2012 (1 percent), Chouteau County saw a 3 percent decrease. Both counties experienced substantial outmigration. However, the higher number of births in Cascade County accounted for the slight net population increase. Similar to the North area counties, the observed outmigration could indicate a lack of economic opportunity in the area. Given the higher birth rate, it is not surprising that the median age in Cascade County is lower than that of Chouteau County (38.7 vs. 41.5). Both counties

experienced an aging of their populations between 2000 and 2012. Median ages increased by approximately 5 percent.

Health outcomes in the Central area, as measured by the County Health Rankings composite indicator, for both Cascade and Chouteau Counties, ranked in the bottom half of all Montana counties. Cascade County ranked 27<sup>th</sup> and Chouteau County ranked 20<sup>th</sup>, out of 46 ranked Montana counties.

### **Land ownership, development patterns, and wildland-urban interface**

81 percent of total acres in the Central area are privately owned. The FS manages a total of just 5 percent of lands in Cascade and Chouteau Counties. State trust lands comprise 9 percent of the Central area. Considering the extent of private and state land ownership, FS land management decisions are likely particularly relevant to state and private forestry managers.

The Central area experienced a notable uptick in residential acres between 2000 and 2010, an increase of 52 percent. Cascade County had considerably more development in the ten-year period than Chouteau County. Residential acreage increased by 22.5 mi<sup>2</sup> in Cascade County and only 0.4 mi<sup>2</sup> in Chouteau County. Land area (mi<sup>2</sup>) in the wildland-urban interface, comprises 78 mi<sup>2</sup> of the Central area. The vast majority, 71mi<sup>2</sup>, of the WUI in the Central area is located in Cascade County. 12 percent of the WUI in Cascade County contains homes. The percent of homes in the WUI in Cascade County is higher than the state average of 9 percent.

### *East county group*

#### **Population dynamics**

The East area is comprised of Meagher, Judith Basin, Wheatland, and Fergus Counties. This area experienced substantial population loss between 2000 and 2012, a 4 percent decrease. The largest population losses, on a percentage basis, occurred in Judith Basin County, where population declined by 12 percent between 2000 and 2012. Similar to counties in the North and Central areas, counties in the East lost population due mainly to net outmigration, save Meagher County, which had a very slight increase in net migration over the same period.

The population in the East area is considerably older than that of Montana, with median ages in the four counties ranging from 47 to 51 (compared to 39 for Montana). The population in the East area is also aging more rapidly than the state as a whole. Between 2000 and 2012, all four East area counties experienced a rise in median age, between 10 and 22 percent.

Health outcomes in the East area, as measured by the County Health Rankings composite indicator, vary considerably by county. Fergus County (ranked 5<sup>th</sup>) and Judith Basin County (ranked 13<sup>th</sup>), have some of the best health outcomes in the state. Conversely, Meagher County (ranked 38<sup>th</sup>) and Wheatland County (ranked 28<sup>th</sup>) had outcomes far below the state average.

### **Land ownership, development patterns, and wildland-urban interface**

Similar to the Central area, the bulk of lands in the East are privately owned (71 percent). While the FS manages just 16 percent of East area lands overall, there is considerable variation across counties. The FS manages 33 percent of Meagher County lands and just 6 percent of Fergus County lands. The BLM manages 11 percent of Fergus County lands, suggesting that FS land management decisions are highly relevant to the managers of that agency. In Judith Basin County, state trust lands account for 8 percent of total lands, suggesting a need for the FS to work closely with state trust land managers when implementing decisions that may affect East area lands.

The East area is sparsely populated. While residential acres increased by 75 percent between 2000 and 2010, the vast majority of lands are still undeveloped. Less than half of one percent of private lands are developed residential acres in the East area. Fergus County had the most developed acres, with 9.3 mi<sup>2</sup> in 2010. Wheatland County has the least, with only 1.9 mi<sup>2</sup>. Land area (mi<sup>2</sup>) in the wildland-urban interface, comprises 168mi<sup>2</sup> of the East area. Less than one percent of the WUI area contains homes.

## Summary

Table 245 summarizes the key social conditions across the HLC NF counties.

**Table 245. Summary of key social conditions by county areas**

	West	North	Central	East
Population trend	Increasing	Declining	Stable	Declining
Percent of WUI lands with homes	5	3	12	<1
Health outcome	Above average	Below average	Below average	Varies by county

## Economic conditions

The area of influence described in the section is different from the social analysis area. The economic area of influence is comprised of 16 counties, an area identified with the most recently available data through methods detailed in the USDA FS Protocols for Delineation of Economic Impact Analysis Areas (METI Corp/Economic Insights of Colorado, 2010).

The Assessment provided details on the economic characteristics and trends including sector and industry presence (jobs), employment (unemployment rate), income (labor and nonlabor), and economic diversification (Shannon-Weaver index). The data in the Assessment were reviewed to determine which economic conditions may be relevant for analyzing the effects of the proposed action and alternatives on economic sustainability. With this lens in mind, the “affected environment” section provides a more focused summation of the economic conditions in the analysis area. Relevant economic conditions are summarized by characteristic.

Total population, employment, and personal income trends since 1970 fluctuate widely across the area of influence counties. Population change since 1970 ranges from 219 percent to negative 42 percent, a measurement for Gallatin and Deer Lodge counties, respectively. Employment change since 1970 ranges from 510 percent to negative 26 percent, a measurement again for Gallatin, and Deer Lodge counties, respectively. Lastly, personal income changes since 1970 ranges from 664 percent to negative 11.4 percent, a measurement for Gallatin and Chouteau counties, respectively.

Unemployment and industry presence fluctuate across counties. Unemployment rate ranges from 8.6 percent to 2.8 percent, a measurement for Glacier and Gallatin counties, respectively. Timber industry presence in private employment ranges from 0-25 percent, a measurement for Powell, and many other counties, respectively. Mining industry presence in private employment ranges from 0-10 percent, a measurement for Jefferson and many other counties, respectively. Agriculture industry presence in private employment ranges from 32 percent to 1.6 percent, a measurement for Judith Basin, and Lewis and Clark and Gallatin counties, respectively. Lastly, travel and tourism industry presence in private employment ranges from 33 percent to 14.3 percent, a measurement for Meagher, and Wheatland counties, respectively.

For most primary counties, timber industries do not represent substantial employment. The exceptions are Powell and Broadwater County, which collectively have more timber jobs than the rest of the area of influence. Table 246 provides the most current data on timber industry employment in the multi-county area, as observed by the U.S. Census Bureau County Business Patterns. An estimated 804 private industry timber jobs exist in this multi-county area.

**Table 246. Timber industry subsector private employment in primary counties, 2015**

County	Growing and harvesting	Sawmills and paper mills	Wood products manufacturing	Total timber	Total private employment
Powell	113	165	2	280	1119
Broadwater	0	165	0	165	854
Gallatin	21	29	63	113	43091

County	Growing and harvesting	Sawmills and paper mills	Wood products manufacturing	Total timber	Total private employment
Park	6	91	2	99	4961
Lewis and Clark	9	26	17	52	25198
Jefferson	1	46	2	49	1769
Cascade	1	14	16	31	30802
Teton	0	7	0	7	1179
Meagher	3	0	0	3	289
Chouteau	2	0	0	2	728
Deer Lodge	2	0	0	2	2758
Glacier	1	0	0	1	2164
Pondera	0	0	0	0	1334
Wheatland	0	0	0	0	364
Judith Basin	0	0	0	0	189

Benefits to society contributed by the HLC NF, including benefits directly contributing to jobs and income for communities are described in detail in the following section.

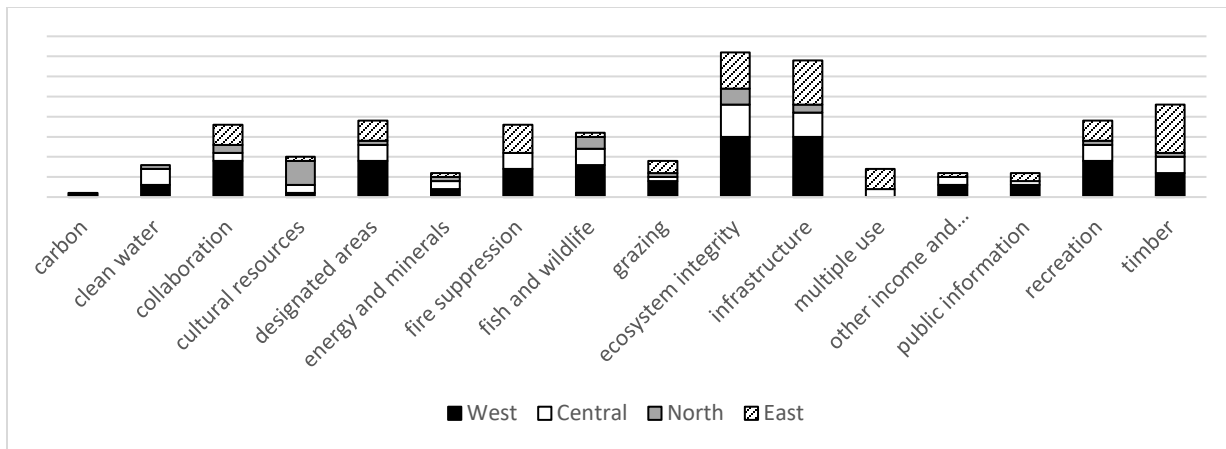
### Societal benefits

The Forest provides a suite of key benefits to local communities, national and even international publics. While some benefits may be relevant to all beneficiaries (local and global), other benefits are more localized, such as jobs maintaining roads on NFS lands. Below is a discussion of the societal benefits the Forest provides and how they contribute to social and/or economic sustainability. Specifically, benefits are described in relation to how they contribute to income and jobs, protecting health and safety or/and contributing to well-being more generally. Relevant social conditions and public comments, where data are available, are examined to determine the magnitude of the contribution provided by the given benefit. Risks and stressors that may affect the ability of the Forest and the larger landscape to continue to contribute to social or economic sustainability are also considered. To gather public input, the interdisciplinary team, in partnership with the Center for Natural Resources & Environmental Policy at the University of Montana conducted several rounds of workshops in ten key local communities. These communities, aggregated by area, are:

- West: Augusta, MT; Helena, MT; Lincoln, MT; Townsend, MT
- North: Browning, MT
- Central: Choteau, MT; Great Falls, MT
- East: Harlowton, MT; Stanford, MT White Sulphur Springs, MT

During the workshops, public input was captured by session facilitators and summarized in workshop reports. The comments are captured in the reports found in the project record. These reports do not provide a statistically significant sample of public opinion. They do provide insight, however, into the key forest benefits workshop attendees' care about most. Figure 27 summarizes the comment topics by social area. In the description of Forest benefits below, public input is sourced from the aforementioned workshop summary reports. In addition to the seventeen key benefits previously identified, workshop participants also raised concerns about managing for conflicts between user groups and the importance of collaboration in management. Stakeholders expressed a keen interest in collaboration and partnerships. Several participants expressed that the Forest should make every effort to include private landowners, tribal governments and local governments in the decision-making processes.





**Figure 27. Public workshop comments by social area<sup>1</sup>**

<sup>1</sup>Data source: CNREP 2015; CNREP 2015a; CNREP 2016; CNREP 2016a; CNREP 2016b

The following subsections describe the key societal benefits of each of the resource area. Refer to the sections for each resource for more complete information.

**Carbon storage and sequestration**

Workshop participants from West area communities noted the importance of carbon sequestration as a key benefit that protects public health by mitigating the amount of carbon dioxide released into the atmosphere. Both national and international citizens and businesses have a keen interest in reducing the amount of carbon dioxide released into the atmosphere (Center for Climate and Energy Solutions, 2017). The Paris Climate Change Accord compelled nations around the globe to reduce carbon dioxide emissions and increase carbon storage and sequestration, with a particular focus on reducing emissions from deforestation (Krupp, 2015). There is strong support, both at home and abroad, for implementing policies that reduce harmful carbon dioxide emissions (2009) .

Communities surrounding the Forest are growing and residential acres are increasing, particularly in the West and Central areas, where residential acres increased over 50 percent between 2000 and 2010. One of the primary detractors of sequestration is the conversion of land to other uses – in addition to the urban sprawl, many areas surrounding the Forest have long been converted to agriculture rather than native plant communities. These changes in land use limit the ability of surrounding landscapes to store as much carbon as they have in the past. Thus, the role public lands play in carbon storage and sequestration will become increasingly more important as residential land use trends continue.

**Clean water**

Many communities depend on ground and surface water from the Forest for both drinking water and agricultural irrigation. These include larger cities such as Helena and Great Falls, and smaller towns including Neihart and White Sulphur Springs. At least 100,000 residents, or one in ten Montanans, rely on water sourced from the Forest for their drinking water.

Workshop participants in the West, Central, and North areas all mentioned clean water as a key benefit that supports income and jobs through agriculture and protects community health by providing safe drinking water. Watershed restoration was a top priority for some local stakeholders. As populations in Helena and Great Falls continue to grow, demand for clean water will follow suit.

### *Cultural, historic, and tribal resources*

Hundreds of cultural, historic and tribal resources exist on the Forest. Stakeholders mentioned cultural, historic and tribal resources as key benefits that enhance quality of life and support income and jobs through tourism. Stakeholders expressed an interest in increasing efforts to restore historical and cultural resources. They also expressed a desire for increased interpretation and stewardship programs. Preservation of cultural resources and values was mentioned as a key benefit by workshop participants in communities across all areas of the Forest. The Badger Two Medicine area was of particular concern to workshop participants in North area communities, which are also environmental justice communities.

### *Designated areas*

The Forest has a plethora of designated areas. Some are designated by Congress while others are designated at the administrative level. Designated areas on the Forest include: IRAs, national recreation trails, a national scenic trail, a national historic trail, recreation areas, RNAs, a cultural district, experimental forests, wilderness areas, WSAs, WSRs, and a wildlife management unit. While each type of designation is unique and has a different management goal or philosophy, the overarching themes for designated areas are to protect ecological integrity and biodiversity, provide the public with opportunities to connect with, be inspired by, and learn from nature and history, and provide scientists with opportunities to study natural processes and impacts of management actions.

Designated areas may enhance the quality of life of both visitors and nonvisitors. Visitors to designated areas have opportunities to engage in a multitude of experiences which enrich their quality of life. These include but are not limited to: carrying out cultural traditions, challenging recreational pursuits, research, exercise, alleviating stress through connecting with nature, learning about history and culture, and becoming inspired by iconic scenery. Extensive literatures from the fields of public health, environmental sociology and environmental psychology document the health benefits (physical, mental and emotional) of connecting with nature and exposure to pristine landscapes (Association, 2013; Zelenski & Nisbet, 2014).

Those who never visit a designated area may also obtain benefits from the area. For example, Cordell and others (2005) find that most Americans are inspired by just knowing a wilderness or primitive area exists, even if they never visit. Cole (2005) highlights the symbolic value of wilderness areas, which serve as demonstrations of human restraint and humility. Designated areas also enhance quality of life through science. Designated areas, and particularly RNAs, provide opportunities for scientific discoveries that advance knowledge for the benefit of society.

Level of access and permitted uses vary by designated areas, and are determined by the laws, regulations, goals and management principles of the given area. Designated areas, their associated level of access, and the array of opportunities offered to the public, are described in detail in the congressionally designated areas and the administratively designated areas sections.

Stakeholders mentioned designated areas as key benefits that enhance quality of life by supporting income and jobs through tourism and supporting community health by providing opportunities to connect with nature and be inspired by wild landscapes (which enhances both physical and emotional health). Stakeholders expressed interest in identifying areas on the Forest that contain underrepresented ecosystems and in prioritizing these areas for consideration of wilderness designation. There was also concern for the health of wilderness landscapes and a desire for integrated restoration in wilderness areas. Stakeholders also expressed an interest in WSR inventory and protection. There were also a series of comments relating to preferences for additional wilderness designation. In communities across all areas of the Forest, some stakeholders expressed a desire for more lands on the Forest to be designated as wilderness while others opposed the designation of additional land as wilderness. Public comments pertaining to particular wilderness inventory areas were reviewed and discussed in more detail in the designated areas sections. Some workshop participants also expressed interest in creating new designated recreation areas. A group of medical professionals in Montana submitted comments

expressing their interest in promoting access to nature and pristine landscapes, in the context of enhancing the quality of life of the public.

In the past decade, visits to designated areas around the country have increased, particularly day visits (Bowker et al., 2006; Hjerpe, Holmes, & White, 2016). This increase in day use of designated areas is expected to continue as urban populations close to designated areas continue to grow (Rasch & Hahn, 2018). Designated areas on the Forest that are in close proximity to the growing urban areas of Helena and Great Falls will likely experience a substantial increase in visits in the coming decades. A key issue raised by the public was permitted uses of designated areas. Preferences for motorized and mechanized (incl. mountain biking) uses in designated areas vary greatly by stakeholder group.

### *Direct income and jobs*

The HLC NF multi-county area of influence has a range of per capita income, average earnings per job, and components of personal income. In 2016 all counties in the area measured lower per capita income and earnings per job than the U.S. average of \$49,246 and \$58,372, respectively. The lowest was Chouteau County at \$31,202 and 22,815 respectively. In most counties, nonlabor personal income was a higher proportion than the U.S. average of 36.8 percent. The counties with the highest nonlabor income ratio include Meagher and Chouteau County at 57.8 percent. Income-maintenance payments (welfare payments), as a component of nonlabor income, can have important implications for social and economic sustainability and environmental justice. Amongst counties in the analysis area, Glacier and Deer Lodge County have the highest proportion of transfer payments, both at approximately 30 percent of their economies.

Employment is also an important indicator of the economic health of an area. Employment (measured as recorded full and part-time jobs) in the multi-county area increased 20 percent from 2000 to 2016, over 1 percent per year, pacing faster than population growth. In 2016, the area recorded 233,070 jobs, an increase of 45,961 jobs, or 2872.6 new jobs per year.

Services-related employment (which includes a wide range of jobs, from restaurant workers and software developers to doctors) makes up the largest share of this economic area. Nearly 75 percent of all new jobs in the area are in services, rather than agricultural, manufacturing or natural resources. Approximately 16 percent of the economy is in nonservice industries, 17 percent is in government, and the remaining is in services. Within nonservice industries, the largest employment comes from farm, construction, and manufacturing, leaving less than 2 percent of the private economy working directly with natural resources.

In 2016, unemployment nation-wide had improved, and most counties in the analysis area were below the U.S. average at 5.7 percent. Unemployment was, however, particularly high in Glacier County at 8.6 percent, which is 3.7 percent higher than the U.S. average.

As observed in 2016, the multi-county area generally fell behind U.S. averages, in terms of personal income, but not necessarily for levels of employment. Increased, or sustained economic well-being could be achieved by activities that lead to increasing per capita income in the area, or increasing proportions of labor income to nonlabor income, particularly in more rural counties, such as Glacier, Chouteau and Deer Lodge County. Employment opportunities are especially needed and important in counties with higher unemployment rates, such as in Glacier County.

The primary risks and stressors to contributed employment and income in the 16 county area around the HLC NF, external of direct FS operations, includes the further loss of forest products industry capacity and infrastructure as well as pattern changes in annual travel and tourism, especially as it relates to nonlocal visitors seeking recreation opportunities.

### *Ecosystem integrity*

Forest ecosystem integrity varies considerably across the landscape. Ecosystem integrity, and particularly stable soils, can protect the public from harm by reducing the risk of flooding and landslides. Ecosystem

integrity also supports habitat for pollinators and rare and endangered species. Just knowing that these species exist is an important value to the public and referred to in the nonmarket valuation of natural resources literature as a nonuse value (Harpman, Welsch, & Bishop, 1994). Therefore, ecosystem integrity can enhance the quality of life of both users and nonuser alike that value the existence of ecosystem integrity.

Participants from communities across all areas noted ecosystem integrity as a key benefit that enhances quality of life. Some participants stressed the need to have flexibility in forest management plans to ensure critical projects can be implemented. Protection of native plants, weed management, using fire as a habitat restoration tool, and considering impacts of climate change were all mentioned as important issues the Forest should consider when planning projects that will restore and/or maintain ecosystem integrity.

### *Energy and minerals*

The Forest contains many areas previously and currently developed for mineral and energy resources. There are also many areas with potential for future energy and mineral development, including renewable energy such as geothermal resources and wind.

There are many hazardous mine openings and features which pose risks to public safety. The Forest mitigates these hazards, as resources allow, and 15 to 25 hazards are mitigated annually. There are three federal Superfund sites on the Forest that pose risks to public health. These sites are administrated by the Environmental Protection Agency. The Upper Tenmile Creek Mining Area is a Superfund site located in the Rimini district near Helena. Lewis and Clark County has relatively high health outcomes, suggesting that the Superfund site is not currently substantially impacting public health. Lewis and Clark County residents are also at risk from the State of Montana Comprehensive Environmental Cleanup and Responsibility Act superfund site, the Upper Blackfoot Mining Complex site, located near Lincoln.

The Barker-Hughesville Mining District Site is located east of Monarch. Residents in Judith Basin County have relatively high health outcomes, suggesting that the Superfund site is not currently substantially impacting their health. Residents in Cascade County have some of the lowest health outcomes in the state, suggesting they may be more vulnerable to potential health impacts from the Barker-Hughesville Mining District Site. Cascade County residents are also at risk from the Carpenter-Snow Creek Mining District site, located near Neihart.

Measured locatable, salable, and leasable mining production on the HLC NF, remains limited to small amounts. As a result, mineral activity on the Forest is not currently contributing a known number of jobs, or labor income.

Workshop participants in communities across all areas noted energy and mineral development as a key benefit that provides income and jobs. Some participants were concerned with the impacts of energy development on the ability of the Forest to provide clean water and habitat for fish species. Participants from North area communities were interested in abandoned mine reclamation projects.

### *Fire suppression (and mitigation)*

The Forest manages both fire suppression and mitigation programs. Fire mitigation and suppression efforts contribute to the safety and well-being of the public by reducing the risk of larger, catastrophic wildfire in the future and protecting communities at risk. Wildland fires impact the public through risk to life and property. Even when fires do not directly impact communities, residents may still experience emotional distress from the stress associated with their perceived risk to life and property (U.S. Department of Agriculture, Forest Service, 2007a). The health of the public is also affected when wildfire smoke reaches unhealthy levels.

Larger wildfire activity and fire mitigation efforts spur economic activity temporarily as agency resources and private service contracts are expended. Some portion of large fire incident and mitigation program spending occurs locally and can boost both employment and income temporarily for community and regional businesses. Additionally, some permanent resources and annual spending is allocated to wildfire management. These

resources contribute to jobs and income as a component of the total contribution from all budgeted operations and planned agency expenditures. Currently FS expenditures from the HLC NF contribute to an estimated 742 jobs, and \$27 million in labor income, annually.

It is important to note that simultaneous to wildfire suppression efforts, wildfire events can cause great economic costs. Large fire activity can deter travel and tourism and change travel patterns during summer and fall. This potential business impact is important to note because it can occur in peak tourism season and can offset economic benefits associated with wildfire suppression efforts. Additionally, smoke and particulate matter generated by wildfires can directly affect public health and disease management, costing individuals and health care systems.

Participants from communities in the West, East and Central areas all mentioned fire suppression and fire mitigation measures (e.g. fuels management through precommercial thinning) as key benefits that enhance community well-being and keep people and property safe from the impacts of wildfire. During listening sessions, county government officials expressed concern that funding is being directed toward suppression, rather than mitigation. There was an expressed preference to steer funding toward harvesting beetle kill timber and other fire mitigation efforts. Some were particularly concerned with fuels management in the wildland-urban interface WUI and expressed interest in increased, active management in the interface to reduce the risk of wildfire damage to their communities. Irrigation districts (particularly on the Rocky Mountain Front) have expressed great concern with wildfires in the wilderness, citing (perceptions of) negative effects to the water they use.

Active management in the WUI is of particular interest to communities in the West area as more homes in the West area are located in the interface, compared to the state overall. Fire social science research also finds that the public is generally supportive of active fire mitigation management, including prescribed burning (McCaffrey & Olsen, 2012).

Researchers have found that future climates are likely to be warm and dry, resulting in the potential for more wildfire and insect disturbances. More residential development is expected in the WUI, particularly in the West area, which may place an increasing number of homes at risk from wildfire.

### *Fish and wildlife*

The Forest provides habitat for a range of fish and wildlife including trout, bats, falcons, bighorn sheep, beavers, moose, black bears and elk. There were approximately 33,000 elk on hunting districts that overlap with the Forest and 295,011 hunter days in 2016. The Forest also provides habitat for the following at-risk species: Canada lynx, grizzly bear, flammulated owl, and Lewis's woodpecker. Consumption of, and activities associated with, fish and wildlife enhance the quality of life of the public. Fish and wildlife are consumed as food and have numerous recreational and cultural uses such as hunting for sport, trapping, viewing by recreationalists, and cultural importance to Native American populations. Fish and wildlife contribute to people's sense of place. People also benefit from just knowing fish and wildlife exist (i.e. they have nonuse value).

Close to 80,000 angler days were reported for high use waters on the Forest in 2014 (U.S. Department of Agriculture, Forest Service, Northern Region, 2015).

Participants from communities across all areas noted providing habitat for fish and wildlife as a key benefit that enhances their quality of life and provides income and jobs from tourism and recreation.

Stakeholders expressed interest in protecting wildlife corridors and increased coordination with state agencies. Some participants were concerned with connectivity and advocated for increases in fish and wildlife corridors that connect ecosystems. Others were interested in reintroduction of bison and some were concerned about conflicts between bison and cattle.

### *Grazing*

Opportunities for grazing enhance the quality of life of permittees by providing them with the opportunity to sustain their rural lifestyles and livelihoods. Opportunities for grazing also enhance to the quality of the life of local publics through contributions to sense of place and rural heritage. Grazing opportunities also enhance the quality of the life of visitors to the Forest and surrounding areas by providing opportunities to view scenic, iconic Western landscapes.

Grazing allotments provide for economic opportunities across a large number of Forest communities. Currently it estimated that grazing programs contribute to 252 jobs, and \$8.2 million in labor income, around the Forest, annually.

Workshop attendees in all areas mentioned grazing as a key benefit that provides income and jobs. Weed management and the impacts of weeds on livestock grazing was a concern for some stakeholders. Stakeholders advocated for an increased effort by the Forest to manage noxious weeds more aggressively. Agricultural interests and county government officials expressed a desire to maintain existing grazing allotments and restore grasslands through BMPs such as improvements to fencing. Some also expressed concern for overgrazing and the impacts of overgrazing on water quality. Others had concerns about conflicts between grazing and recreational uses as well as grazing impacts in wilderness areas. Current demand for forage from livestock operators with private land adjacent to the Forest is greater than the Forest can provide.

### *Infrastructure*

The Forest provides an extensive system of roads, trails and airstrips for the use and enjoyment of the public. This transportation system provides the public with access to public land and enhances the quality of life of those who use the system. Transportation infrastructure also enhances public health and safety by providing access for emergency rescue teams and firefighters.

Workshop participants from all area communities noted infrastructure as a key benefit that enhances quality of life and health by providing opportunities to access nature (which enhances both physical and emotional health). Roads, trails, trailheads and airstrips were all mentioned as important benefits. Many noted that road decommissioning would limit access for recreation and firewood collection. There was particular concern that access would be limited for the elderly, who mainly access the Forest via motorized means. Many communities around the Forest have relatively older populations, compared to Montana and the nation overall. Thus, maintaining access for the elderly is of particular concern.

### *Other forest products and wood for fuel*

Forest products enhance the quality of life of those who harvest and consume them. Some special forest and botanical products hold particular value for tribes. Forest products may also enhance the health of those who consume them for medicinal purposes.

The HLC NF timber program, which administers the sale of wood material, contributes to an estimated 119 jobs, and \$5.4 million in labor income, annually. Currently, a large proportion of the total sold and harvested wood volume from the Forest is used for fuel, and other nonsawlog forest products.

Although collection of forest products for personal use does technically require a permit, demand for most forest products is not well-known.

### *Other income and jobs*

Agency operations, in addition to the other multiple-use resources, provide income and jobs to local economies surrounding the Forest. Another economic relation between Federal land and counties are Federal revenue sharing and land payments, including Secure Rural Schools and payments in lieu of taxes. State and local governments cannot tax federally owned lands the way they can tax privately owned lands. As a result, a number of Federal programs exist to compensate county governments for the presence of Federal lands. These

programs can represent a substantial portion of local government revenue in rural counties with large Federal landholdings, such as the counties in the analysis area.

Before 1976, all Federal payments were linked directly to receipts generated on public lands. Congress funded payments in lieu of taxes, with appropriations beginning in 1977, in recognition of the volatility and inadequacy of Federal revenue-sharing programs. Payments in lieu of taxes are intended to stabilize and increase Federal land payments to county governments. More recently, the Secure Rural Schools and Community Self-Determination Act of 2000 decoupled FS payments from commercial receipts. Secure Rural Schools received broad support because it addressed several major concerns around receipt-based programs—volatility, the payment level, and the incentives provided to counties by linking Federal land payments directly to extractive uses of public lands.

Payments in lieu of taxes and Secure Rural Schools each received a substantial increase in Federal appropriations through the Emergency Economic Stabilization Act of 2008. Despite increased appropriations at times, Secure Rural Schools funding status remains in question. A number of bills presented in the 115<sup>th</sup> (2017-2018) Congress address Secure Rural Schools funding but have not yet been passed by congress or into law.

The two most substantial land payments to counties in the analysis area are payments in lieu of taxes and FS receipts. Since 2008, FS receipts have declined steadily for counties around the HLC NF, where payments in lieu of taxes have increased or stayed flat. Payments in lieu of taxes formulas are specifically based on population and acres of Federal land. Under this payment structure, Gallatin, Lewis and Clark, and Park County receive considerably higher payments in lieu of taxes (\$2-3 million annually) than the other counties in the analysis area. Conversely, Meagher and Powell Counties rely heavily on FS receipts, which make up a large percentage of their total Federal land payment.

HLC NF related payments to states and counties currently contribute to an estimated 151 jobs, and \$6.8 million in labor income, annually.

Workshop participants from the West, Central, and East area communities noted other income and jobs as key benefits the Forest provides. Some participants noted jobs and income generated from recreation as particularly important. Others noted jobs and income from range and mineral development as key benefits. County government officials expressed the need for the continuation of Secure Rural Schools and payments in lieu of taxes as county budgets rely on these funds to provide services.

The greatest risk to Federal land payments is congressional or executive branch policy changes, which at any time could dissolve or partially remove these revenue streams, which are particularly important in the western United States. A secondary risk to counties exists, if agencies were to reduce or seize management activities. FS receipts are directly tied to the level of timber sold and harvest from within a given county. For counties with a higher proportion of FS receipts, a greater fiduciary risk exists with relation to continued forest management activity.

### *Public information, interpretation and education*

The Forest provides the public with opportunities to connect with nature and learn about the history and cultural significance of the area through public information, interpretation and education services. These programs enrich the quality of life of participants. Some examples include: the Lewis and Clark National Historic Trail Interpretive Center programs, educational lectures with elementary school students, citizen science programs, day camps, star gazing nights and volunteer programs.

The Forest also provides essential safety information to communities affected by Forest conditions such as wildfires. Forest communication efforts can be effective tools for building trust with local stakeholders. Trust between agencies and communities is an essential component for achieving forest management and restoration goals (McCaffrey & Olsen, 2012).

Workshop participants from the West, Central, and East area communities noted public information, interpretation, and education as key benefits that enhance quality of life, and particularly the health and safety (e.g. hazardous smoke updates and bear safety information) of the public. Many stressed the importance of communicating Forest management actions to the public and educating the public on why certain projects are being implemented.

### *Recreation*

A multitude of recreation settings, opportunities, access and special uses exist on the Forest. Recreation activities enhance the well-being and health of those who engage in them. There is extensive literature on the physical, emotional and mental health advantages of outdoor recreation (Association, 2013; Backus, 2014; Kawashima, 2009; Ontario Federation of Trail Riders, 2019; Vella, Milligan, & Bennett, 2013; Zelenski & Nisbet, 2014). The Forest provides many different types of recreation experiences which provide opportunities to connect with nature, find spiritual inspiration, engage in physically challenging pursuits, and experience solitude in natural settings.

Recreation on the HLC NF, as is the case on many NFs, is an important component of the contribution to Forest community economic sustainability. Currently the HLC NF contributes to an estimated 238 jobs, and \$6.7 million in labor income, annually.

Participants from communities across all areas noted recreation as a key benefit which enhances well-being and community health, as well as providing jobs and income. There is concern that roads are being decommissioned and will prevent access to recreation opportunities. Many participants noted a preference for increased recreation access. Others expressed concern over user conflicts and advocated for more areas designated for particular users. Some noted a need to manage for conflicts between recreationalists and cattle grazing.

### *Scenery*

The Forest contains many scenic landscapes, beautiful vegetation, and unique geologic features that enhance the well-being and health of the public. Viewing scenery is associated with health benefits such as reduced stress levels and a sense of joy. Scenery also contributes to the sense of place people attach to a given landscape.

Scenery including forested landscapes can influence population and economic growth by encouraging migration as well as travel and tourism. Travel and tourism related industries alone, employ an estimated 22 percent of all private jobs in the economic area of influence surrounding the HLC NF. The relative degree to which scenery contributes to population growth and travel and tourism spending remains unknown, but nonetheless it remains a notable factor for community economic health.

Participants from communities across all areas noted scenery as a key benefit that contributes to their sense of place and well-being.

### *Timber*

The Forest contains valuable timber resources, including products that are in demand by the American public. Commercial timber harvest may enhance the quality of life and safety of the public by improving watershed condition, improving wildlife habitat, and/or reducing wildfire risk through reduced fuel loads.

The HLC NF timber management program, which administers the sale of timber and other wood material, currently contributes to an estimated 119 jobs, and \$5.4 million in labor income, annually.

Participants from communities across all areas noted timber as a key benefit that provides jobs and income. Local stakeholder expressed concern that timber harvest decisions take too long. Others were concerned about effects of timber harvest to water quality and wildlife habitat. County officials expressed concern that declining timber harvest negatively impacted local economies. Some stakeholders expressed a desire for



increased timber production and harvest on the Forest. Others opposed timber production on the Forest. Many noted that timber harvest should be used as a tool for wildlife habitat restoration and to improve forest health.

Market conditions present risks regarding the economic feasibility of managing forests and providing timber for forest products.

### **Environmental justice**

In the Assessment, county-level populations were analyzed, according to the Council on Environmental Quality (1997) criteria, to determine whether or not they met the definition of an environmental justice county. These determinations are summarized below. For more detail on the criteria, please see the Methodology section (appendix B).

None of the West or East area counties met the criteria for environmental justice counties under either the “minority population” test or the “low-income population” test. In the North area, both Glacier and Pondera Counties met the definition of environmental justice counties under both the “minority population” and the “low-income population” tests. In the Central area, Choteau County met the definition of an environmental justice county under the “minority population” and “low-income population” tests.

In sum, the following three counties were identified as environmental justice counties in the Assessment: Glacier County (North area), Pondera County (North area) and Choteau County (Central area). In all three environmental justice counties identified, the minority and low-income populations are Native American. For a detailed breakdown of minority and low-income populations by county, please see the Assessment. In the subsequent analysis of alternatives, effects to minority and low-income populations in Glacier, Pondera, and Choteau Counties were considered to determine whether the proposed action or alternatives would disproportionately affect populations in these environmental justice counties.

### **3.26.6 Environmental consequences**

#### **Effects common to all alternatives**

The previous sections assessed the social and economic conditions of the affected environment and the societal benefits the Forest provides. The affected environment section provides a baseline understanding of how the Forest currently contributes to social and economic sustainability, for local beneficiaries and the general public, where applicable. The key dimensions of social and economic sustainability assessed are how the Forest (and Forest management) contribute to: income and jobs, quality of life and well-being, and the health and safety of the public. The following section considers the potential impacts of alternative management scenarios on these contributions. This section provides a brief summary of the impacts to the benefits the Forest provides, and places those benefits in the context of contributions to social and economic sustainability. For more details and the complete analysis of effects to specific Forest resources, please see the relevant resource sections.

#### ***Climate and Carbon Storage and Sequestration***

Wildfires may become more severe as a result of expected hotter and drier climates in the future. The scale of wildfires, coupled with limited resources, may result in a decline in the ability of the Forest to actively mitigate wildfire risk in affected communities. All alternatives are focused on promoting forest health and would not negatively impact the Forest’s ability to store and sequester carbon in the future.

#### ***Cultural, historic and tribal resources***

All alternatives would provide protections for cultural, historic and tribal resources. Contributions from cultural resources to the well-being of the public in expected to continue under all alternatives.

### *Designated areas*

All alternatives would provide for the protection of designated areas, according to the relevant laws and regulations. Designated areas contribute to the health and well-being of the public under all alternatives. The projected increase in visits to designated areas may compromise those areas' abilities to meet management goals such as maintaining opportunities for solitude, in the case of wilderness, or maintaining sufficient elk populations for hunting, in the case of the Elkhorns Wildlife Management Unit. Climate change may also impact the ecological integrity of ecosystems within designated areas. Increases in invasive species and decreases in native species populations may occur, affecting the pristine nature of some designated areas, and thus impacting the contributions of designated areas to the quality of life of the public.

### *Ecosystem integrity*

All alternatives would provide plan components intended to preserve and restore ecosystem integrity. Ecosystem integrity would continue to contribute to the health, safety and well-being of the public under all alternatives.

### *Energy and Minerals*

All alternatives would provide opportunities for energy and mineral development. Impacts to the health and safety of the public from energy and mineral plan direction are not expected, given the legal requirements for mitigation of environmental impacts and reclamation. In communities where income and jobs are dependent on the energy and minerals industries, mining and energy development opportunities provided by the Forest would indirectly contribute to social sustainability through contributions to jobs and income, which in turn contribute to the well-being of local residents. Fluctuations in the global prices for minerals may impact demand for mineral development.

### *Fire suppression (and mitigation)*

All alternatives would promote fire mitigation programs. Fire suppression tactics are employed when deemed appropriated to protect values at risk. These programs contribute to the well-being and safety of the public by protecting life and property at risk, particularly for those wildland-urban interface communities in the West area. No substantial impacts to public health from smoke from prescribed burning are expected under any of the alternatives as all prescribed burning activities must comply with the Clean Air Act.

### *Fish and wildlife*

All alternatives would provide fish and wildlife habitat for an array of species. Opportunities to consume, and otherwise engage in fish and wildlife related activities, including fishing and hunting, would be provided and are not expected to vary substantially across alternatives at the forestwide scale. These opportunities contribute to the well-being of hunters, anglers and wildlife-viewers. Plan components designed to enhance fish and wildfire habitat also contribute to the well-being of those who are inspired by just knowing certain species (e.g. grizzly bear, bull trout) exist.

### *Grazing*

Opportunities for grazing are provided for, and would not vary by, alternative. In communities where income and jobs are dependent on the livestock and ranching industries, grazing opportunities provided by the Forest would indirectly contribute to social sustainability through contributions to jobs and income, which in turn contribute to the well-being of local residents.

### *Infrastructure*

The current system of roads, trails and airstrips would provide access to the public and contribute to the well-being of those who use the system by providing opportunities to connect with nature. No notable impacts to well-being of road users are expected, across all alternatives.

### *Other forest products and wood for fuel*

Forest products would be available to the public under all alternatives and would contribute to the well-being of those who harvest and/or consume them.

### *Public information, interpretation and education*

Opportunities to learn about and connect with nature would be provided and would contribute to the well-being, health and safety of the public.

### *Recreation*

A plethora of opportunities for recreation across all recreation settings would be provided. These opportunities would contribute to the well-being, health and safety of those who recreate on the Forest.

### *Scenery*

Scenery would contribute to the well-being and health of the public, under all alternatives.

### *Timber*

Sustainable levels of timber would be provided under all alternatives. In communities where income and jobs are dependent on the timber industry, timber provided by the Forest would indirectly contribute to social sustainability through contributions to jobs and income, which in turn contribute to the well-being of local residents.

## **Effects that vary by alternative**

The only variation in employment and labor income, across alternatives stems from known differences in wood quantities sold, and hence more or fewer jobs contributed from timber and other forest products. Alternative E would allow for the highest level of wood volume and hence would contribute more jobs and labor income than the other alternatives.

### *Jobs and income*

All alternatives would provide similar economic contributions, increasing jobs and income over the current contribution. Current contributions are measured based on data for current Forest management, operations and natural resource outputs. Alternatives, conversely, are analyzed according to their highest potential for wood sale quantities.

Results of the economic contribution analysis appear in the two tables below. In Table 247 employment refers to levels of employed individuals, full and part-time included, on an annual basis. In Table 248, labor income refers specifically to earned wage or proprietor income and does not include Social Security, Medicaid, dividends, or capital gains, i.e., government programs or investments.

Income and employment levels contributed by the Forest and FS operations do not fluctuate widely between alternatives. However, as shown in these tables, income and employment are different across alternatives due to changing assumptions regarding forest management activities under the timber program. Between alternatives A and E, job contributions range between 1502 and 2104 jobs, and labor income between \$59.8 and \$88.6 million. The preferred alternative, alternative F, has the second highest economic impacts amongst alternatives, contributing 2,000 jobs and \$83.7 million in labor income.

While not realistic, it can also be informative to look at the hypothetical economic contributions in the absence of a budget constraint. Table 249 and Table 250 below show the estimated jobs and income contributions based on higher timber harvest levels due to the lack of a budget constraint. This shows the economic contribution levels that the forest could trend towards if budgets were increased from current levels.

All alternatives would produce more jobs and income over current levels, with alternative E producing the most. Variation in employment, across alternatives stems from known differences in wood quantities sold, and

hence more or fewer jobs from timber resources. It is anticipated that recreation related visitation to the Forest will increase over time, regardless of the alternatives and so the economic impact model does not differentiate visitation levels, or the recreation impacts between alternatives. However, the Forest anticipates increased local and nonlocal visitation through enhanced recreation and wilderness areas. Nonmonetary benefits to various recreation user groups ranges between alternatives as well. For more information on recreation benefits see the recreation section.

The greatest contribution to employment and income from the HLC NF comes through FS expenditures, which includes general operations and contracted services. Ordered from higher to lower; range, recreation, Federal land payments, and timber management programs also contribute to jobs and income.

For more information regarding the following two tables, see the project record document entitled “Details of the IMPLAN economic impact analysis for the Helena Lewis and Clark Plan EIS.”

**Table 247. Employment in the analysis area by resource and alternative (direct employment contribution, estimated number of jobs)**

Resource	Current	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Recreation	238	238	238	238	238	238	238
Grazing	252	252	252	252	252	252	252
Timber	119	512	528	528	530	721	616
Minerals	0	0	0	0	0	0	0
Payments to states/counties	151	151	151	151	151	151	151
FS expenditures	742	742	742	742	742	742	742
Total management	1,502	1,896	1,911	1,911	1,913	2,104	2,000
Percent change from current	---	26.23%	27.23%	27.23%	27.36%	40.08%	33.16%

**Table 248. Labor income in the analysis area by resource and alternative (average annual labor income, in thousands of 2018 U.S. dollars)**

Resource	Current	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Recreation	\$7,309	\$7,309	\$7,309	\$7,309	\$7,309	\$7,309	\$7,309
Grazing	\$8,985	\$8,985	\$8,985	\$8,985	\$8,985	\$8,985	\$8,985
Timber	\$5,958	\$24,794	\$25,526	\$25,526	\$25,644	\$34,738	\$29,766
Minerals	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Payments to states/counties	\$7,455	\$7,455	\$7,455	\$7,455	\$7,455	\$7,455	\$7,455
FS expenditures	\$30,184	\$30,184	\$30,184	\$30,184	\$30,184	\$30,184	\$30,184
Total management	\$59,891	\$78,728	\$79,460	\$79,460	\$79,577	\$88,671	\$83,699
Percent change from current		31.45%	32.67%	32.67%	32.87%	48.05%	39.75%

**Table 249. Employment in the analysis area by resource and alternative without budget constraint (direct employment contribution, estimated number of jobs)**

Resource	Current	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Recreation	238	238	238	238	238	238	238
Grazing	252	252	252	252	252	252	252
Timber	119	773	845	845	826	929	849
Minerals	0	0	0	0	0	0	0
Payments to states/counties	151	151	151	151	151	151	151
FS expenditures	742	742	742	742	742	742	742
Total management	1,502	2,156	2,228	2,228	2,209	2,312	2,232
Percent change from current		43.5%	48.3%	48.3%	47.1%	53.9%	48.6%

**Table 250. Labor income in the analysis area by resource and alternative without budget constraint (average annual labor income, in thousands of 2018 U.S. dollars)**

Resource	Current	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Recreation	\$7,309	\$7,309	\$7,309	\$7,309	\$7,309	\$7,309	\$7,309
Grazing	\$8,986	\$8,986	\$8,986	\$8,986	\$8,986	\$8,986	\$8,986
Timber	\$5,958	\$37,220	\$40,671	\$40,671	\$39,783	\$44,681	\$40,848
Minerals	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Payments to states/counties	\$7,455	\$7,455	\$7,455	\$7,455	\$7,455	\$7,455	\$7,455
FS expenditures	\$30,184	\$30,184	\$30,184	\$30,184	\$30,184	\$30,184	\$30,184
Total management	\$59,893	\$91,154	\$94,605	\$94,605	\$93,717	\$98,616	\$94,782
Percent change from current	---	52.2%	58.0%	58.0%	56.5%	64.7%	58.3%

**Designated areas**

All action alternatives provide additional recognition for national recreation trails. This additional emphasis may lead to greater public awareness of the trails and an increase in new users. All action alternatives provide specific plan components for IRAs that enhance and/or protect those areas for present and future generations. The greater emphasis on managing designated areas for their intended purposes may result in greater contributions to the quality of life, health and well-being of the public, compared to alternative A.

Alternative D would provide the largest contribution from designated areas to the well-being of the public, as the majority of Americans value and benefit from (either directly or indirectly) the preservation of recommended wilderness landscapes. An additional RNA would be a candidate for designation under alternative D and F, which may provide more opportunities for scientific research of grassland ecosystems.

Alternative E is expected provide the smallest contributions to the well-being and health of those who use and/or value designated areas for their natural and/or wild characteristics.

### *Ecosystem integrity*

All action alternatives include plan components are designed to maintain and enhance the health of ecosystems. Under all action alternatives, explicit desired conditions for terrestrial vegetation are developed to be consistent with the NRV, with consideration for climate change vulnerabilities. Alternative A would not necessarily preclude similar goals or management opportunities but does not contain similar direction.

Alternative E is expected to result in the fewest acres treated (with a constrained budget) to restore ecosystem integrity and therefore, a landscape less resilient to insect and disease outbreak. Therefore, contributions to the well-being, health and safety of the public from ecosystem health may be lowest under alternative E, compared to all other action alternatives.

### *Energy and Minerals*

Access to locatable, leasable and salable minerals, as well as opportunities for mineral entry, mineral prospecting, exploration and development would vary by alternative. Contributions to the well-being of those who enjoy and/or base their livelihoods on mineral-related activities, are expected to be highest under alternative E, followed by A, F, C and then B. Contributions are expected to be lowest under alternative D.

### *Fire suppression (and mitigation)*

All action alternatives include plan components that incorporate the best available scientific information for fire suppression and mitigation management. These components are expected to provide a larger contribution to the well-being and safety of the public, compared to expected contributions under alternative A.

### *Fish and wildlife*

All action alternatives include plan components designed to enhance fish and wildlife habitat and connectivity, above and beyond the conditions expected under alternative A. There are also specific standards and guidelines designed to protect old growth areas, provide sufficient snags and coarse woody debris, and shield riparian areas from potential impacts of timber harvest activities. Plan components are also designed to minimize the potential for impacts to wildlife resulting from resource management activities or uses, and to reduce wildlife-human conflict. Therefore, contributions to the quality of life of the public from fish and wildlife activities are expected to be greater under all action alternatives, compared to alternative A.

Alternative D has the most land identified as RWAs. As a result, alternative D has the lowest likelihood of negative impacts to fish and wildlife habitat from motorized and mechanized use, compared to all other alternatives. Alternative D also provides the most opportunities for wildlife connectivity among island mountain ranges.

Alternative E has no RWAs and the highest expected level of motorized use, which, in turn, may result in greater impacts to fish and wildlife habitat, compared to all other alternatives. Contributions to well-being from fish and wildlife related activities are expected to be lower under alternative E, compared to B, C, D and F.

### *Grazing*

Under alternatives B, D and F, portions of allotments would be recommended for wilderness designation and motorized and mechanized uses would not be suitable. The well-being of the permit holders of these allotments may be impacted by this designation as they would be required to apply for permits to access portions of their allotments using motorized vehicles, to the greatest extent with alternative D. Under alternative C, portions of 24 allotments would be recommended for wilderness designation and motorized and mechanized uses would be permitted. The well-being of the permit holders of these allotments would not be impacted by this designation. Alternatives A and E would not impact how permittees currently access their allotments relative to RWAs.

### *Infrastructure*

Road maintenance is often required as part of timber harvest projects. Under alternative E, fewer acres are expected to be harvested, compared to all other alternatives. Therefore, contributions to the well-being and safety of those who use forest roads are expected to be smaller under alternative E, compared to alternatives B, C, D, and F.

### *Other forest products and wood for fuel*

All action alternatives include plan components designed to maintain and enhance the health of ecosystems, including conditions which enhance the production of nontimber forest products. Therefore, contributions to the quality of life of those who harvest and/or consume other forest products are expected to be greater under all action alternatives, compared to alternative A.

### *Public information, interpretation and education*

All action alternatives include plan components designed to increase opportunities for the public to learn about and connect with nature. These include components that place a greater emphasis on partnerships and volunteer opportunities, as well as goals for joint stewardship. Education programs are also expected to increase public awareness of best practices for wildfire mitigation and reduce human-wildlife conflict. Public outreach and education programs have been shown to build trust between agencies and the public (McCaffrey & Olsen, 2012), improve the quality and efficacy of wildfire mitigation and suppression planning and management efforts (Steelman & McCaffrey, 2013), and increase public safety. Therefore, contributions to the well-being, health and safety of the public are expected to be greater under all action alternatives, compared to alternative A.

### *Recreation*

All action alternatives include plan components designed to enhance recreation opportunities and access and provide safer experiences to recreationalists. Therefore, contributions to the well-being, safety and health of recreationalists are expected to be greater under all action alternatives, compared to alternative A. All action alternatives include additional direction on constructing new recreation sites within riparian areas and developing future water supplies. Alternative A does not address these issues. These plan components may curtail development of new sites in riparian areas and may have a marginal impact on the well-being of recreationalists who desire new developed sites in riparian areas.

The contributions to the well-being and health of recreationalists varies, depending on which type of recreation they prefer. Those who prefer primitive experiences would benefit the most from alternative D. Those who prefer motorized or mechanized experiences would benefit the most from alternative E. There are still ample opportunities for mechanized and motorized recreation settings and access across all alternatives.

According to the most recent survey data available (U.S. Department of Agriculture, Forest Service, 2017), eleven percent of Forest visits involved motorized uses (excluding driving for pleasure) and five percent of visits involved mechanized uses. The number of mechanized and motorized users are expected to increase with the uptick in West area populations. The limitations on mechanized uses in alternative D, amounting to a 30 percent reduction in trails open to mountain bikes, may impact contributions to the well-being and health of the growing population of mountain bikers and mechanized users in West area communities.

The minor limitations on motorized uses under alternatives B, C, D, and F, are not expected to substantially impact contributions to the well-being and health of motorized recreationalists. Only a seven percent reduction in acres open to motorized over-snow use and a seven percent reduction in motorized trails are expected under alternative D, which is the most restrictive in terms of motorized use.

Under alternatives A, C, and E, expected increases in motorized and mechanized use may impact opportunities for solitude and quiet recreation settings. These impacts may reduce contributions to the well-being and health of those who prefer primitive recreation settings.

Under alternative E, fewer acres would be treated to promote ecosystem integrity and resilience. A less resilient forest could lead to lower quality recreation experiences. Impacts could include less aesthetically pleasing scenery, fewer fish and wildlife encounters, and more area closures due to wildfire.

### *Scenery*

All action alternatives include plan components designed to enhance scenery and scenery management and planning. Plan components in all action alternatives are designed to maintain and promote old growth. Contributions to the well-being of those who value the scenery on the Forest would be greater under all action alternatives, compared to alternative A.

### *Timber*

Under alternative E, the highest amount of timber volume would be removed, compared to all other alternatives. Larger contributions to income and jobs in the forest products industry are expected. This alternative may negatively impact the quality of life of those who are opposed to timber harvest due to preservationist values. This alternative provides the largest contribution to those who benefit from income and jobs in the forest products industry.

### **Cumulative effects**

The same analysis area used to analyze the above effects to contributions to social sustainability is used to analyze cumulative effects. Present and foreseeable future conditions or activities that could affect the Forest's contributions to social and economic sustainability are described below. Cumulative effects are described in the context of social conditions and societal benefits, where data are available. Land management plans for neighboring forests are not expected to negatively affect contributions to social sustainability. For a detailed analysis of cumulative effects for a given benefit, please see the relevant resource section.

### *Population change*

The population in the communities in the West surrounding the Forest is increasing. This uptick in population has resulted in increased demand for housing, and the subsequent conversion of forested lands to residential acres, limiting the ability of lands near the Forest to store and sequester carbon. These trends in population and residential acres may result in a decline in the ability of the larger landscape to store and sequester carbon. The carbon released through natural disturbance on the Forest and residential development in neighboring landscapes combined is minuscule, compared to national carbon dioxide emissions, and should not substantially impact global public health in the long term.

Projected increases in local populations in the West area are expected to lead to increases in recreational uses on the Forest. Impacts from increased recreational uses may affect the Forest's ability to provide clean water to the public in the future. Population increases may also impact the Forest's ability to maintain wilderness character in RWAs.

Given the trends in population in communities surrounding the Forest, it is expected that use will likely increase in areas on the West side of the Forest, near the growing population center of Helena. Populations are either declining or increasing only marginally in communities in the North, Central, and East areas. Estimated visitation to the Forest is approximately 700,000 visits annually. 70 percent of visits to the Forest are from visitors within 100 miles of the Forest. Approximately ten percent of visits include a motorized or mechanized activity (U.S. Department of Agriculture, Forest Service, 2017). Given these levels of visitation, population trends and levels of motorized and mechanized use, substantial increases in motorized and mechanized uses are not expected, with the exception of areas easily accessible from Helena.



### *Environmental Protection Agency management*

The three federal superfund sites in the planning area are managed by the Environmental Protection Agency. These sites have the potential to impact the health of residents in the analysis area and the Environmental Protection Agency may have limited capacity to fully address these clean-up efforts.

### **Environmental justice, environmental consequences**

As discussed in the affected environment section, environmental justice populations exist within the planning area. Populations most at risk of experiencing disproportionately high and adverse human health or environmental effects include low-income households and Native Americans living on reservation lands. These populations are not mutually exclusive and are present in three counties: Glacier County, Pondera County and Choteau County.

Under all the alternatives, the Forest management activities would contribute to social and economic sustainability by providing key benefits to environmental justice communities. These benefits, which include the protection of cultural resources and sacred sites, provision of clean drinking water, and fire suppression activities, contribute to the quality of life, well-being and health and safety of environmental justice communities. The Forest would continue to provide access to traditional lands and areas of cultural significance.

Approximately 20 percent of jobs in Glacier and Pondera counties are in the travel and tourism sector. All action alternatives support tourism and travel employment by providing opportunities to access and recreate on Forest lands. Ecosystem protections ensure that visitors have opportunities to experience high quality, pristine landscapes. Less than one percent of employment in Glacier and Pondera counties is in the timber industry. Specific timber industry data were not available for Choteau County. However, less than four percent of employment in Choteau County is in the fishing, farming and forestry sector. The amount of lands suitable for timber production varies by alternative. Given the relatively small proportion of employment in the timber industry, the amount of lands suitable for timber production should not greatly impact employment opportunities in environmental justice counties. There are no populations in the planning area that would experience important, adverse human health impacts or environmental impacts due to management actions proposed under any of the alternatives.

### **Conclusions**

The anticipated effects of the proposed action and alternatives would meet the purpose and need because, under all alternatives, a full suite of key forest benefits would be provided and are expected to contribute to social and economic sustainability. Under all alternatives, the well-being, health and safety of affected publics would not be substantially, negatively impacted. Conversely, under all alternatives, there would be notable contributions to the well-being, health and safety of the public. The relative size and type of contributions vary by alternative.

## **3.27 Livestock Grazing**

### **3.27.1 Introduction**

This section addresses livestock grazing as well as the health of associated rangelands. The scale of the analysis is the entire HLC NF planning area, focusing on the range allotments located therein.

Public comment on livestock grazing in the HLC NF planning area generated several issues during scoping. Comments centered on providing for grazing opportunities on suitable rangelands, balancing forage use by domestic livestock with ecosystem functions, regulating grazing activities by implementing more stringent

standards and guidelines, or reducing or eliminating livestock grazing to allow for vegetation and riparian recovery.

Domestic livestock grazing has been, and continues to be, an important multiple use of NFS lands within the planning area. Livestock grazing has been a use of public lands since the inception of the FS and has become an important part of the culture of the rural western U.S. The objectives for FS management of rangelands include managing rangeland vegetation to provide ecosystem diversity and environmental quality while maintaining relationships with allotment permittees; meeting the public's needs for rangeland uses; providing for livestock forage; maintaining wildlife food and habitat; and providing opportunities for economic diversity. Rangeland management is an essential part of the FS multiple-use strategy. This strategy ensures that rangelands provide essential ecosystem services such as wildlife habitat and related recreation opportunities, watershed functions, and livestock forage.

Although rangelands provide a variety of ecosystem services, such as wildlife habitat, recreation, watershed functions, carbon sequestration, and biodiversity conservation, these lands have primarily been managed for forage production and livestock grazing. Forage is a provisioning service. Provisioning services include all tangible products from ecosystems that humans make use of for nutrition, materials, and energy. Forage is managed by the FS to be sustainable, ensuring that it will be available for future generations while still providing the other rangeland's ecosystem services required by their multiple use strategy.

Areas with suitable rangelands are divided into grazing allotments, oftentimes along watershed boundaries. Rangeland and transitory range within these allotments provide forage for grazing opportunities. Transitory range is defined as forested lands that are suitable for grazing for a limited time following a timber harvest, fire, or other landscape events (Spreitzer, 1985). Livestock grazing is considered a privilege on National Forest System lands and authorized through Forest Service term grazing permits issued to eligible commercial livestock owners.

Livestock grazing management is established through forest plans, FS grazing guidelines, and individual allotment management plans. These plans are developed to be comprehensive using sound science and incorporating public involvement. Plans are revised and updated to ensure that livestock grazing management decisions are based on existing and future ecological, social, cultural, and economic conditions.

The successful management of livestock grazing use on the HLC NF relies upon the maintenance of healthy, functioning rangelands. Please refer to the discussions for nonforested vegetation communities in the terrestrial vegetation section and the RMZ section. These sections focus on the health of those plant communities used for grazing purposes, and how the plan components would affect livestock grazing in the planning area.

### Effects indicators

The indicators and measures used to analyze effects or changes to livestock grazing opportunities on the HLC NF are:

- Expected rangeland condition and trend, measured as rangeland acres meeting, not meeting, or moving towards desired rangeland condition as a result of management actions.
- Acres of suitable rangeland analyzed as changes in suitable acreage available for livestock grazing as well as changes in forage producing capability.
- Number of permitted livestock head months (HMs), measured in changes of permitted livestock numbers over time based on the implementation of plan components, such as more intensive management of RMZs and aquatic threatened and endangered species habitat.

### Changes between draft and final

Wording of some plan components was updated, while two new components, FW-GRAZ-STD-03 and 04, were added to formalize maintaining effective separation between domestic sheep and goats and bighorn sheep

herds on NFS lands. Analysis for these two standards is found in Effects common to all action alternatives in this section. Several minor additions were made to the analysis provided in the DEIS to clarify items brought up from public comment. Consideration and analysis of alternative F was also added to this section.

### 3.27.2 Regulatory framework

#### Federal Law

**The Public Rangelands Improvement Act of 1978** recognizes the need to correct unsatisfactory conditions on public rangelands by increasing funding for maintenance and management of these lands.

**The Rescission Act of 1995** directs the FS to complete site-specific NEPA analyses and decisions for grazing allotments on a regularly scheduled basis based on the permit requirements.

#### Regulation, policies, and guidance

The following regulations and policies have been developed to support implementation of the acts and executive orders previously presented:

**National Grasslands Management - A Primer (1997)**: a document identifying and interpreting the laws and regulations applicable to the administration of the national grasslands.

**USDA Environmental Compliance, Policy on Range, Departmental Regulation, Number 9500-5, April 21, 1988**; This regulation sets forth Departmental Policy relating to range services and coordination of range activities among agencies of the USDA and other executive agencies, organizations, and individuals.

#### *Other agreements and plans*

The following agreements and plans also support the FS's rangeland management program:

**Memoranda of understanding for forage reserves.** Forage reserves are allotments under a term grazing permit but may be used by other permittees that have been temporarily displaced due to wild or prescribed fire, drought, or other situations that have made forage unavailable.

**Non-use for resource protection agreements.** These agreements may be established to provide long-term nonuse to allow rangelands to recover, provide forage on a temporary basis to allow resource recovery on other grazing units, provide temporary resolution of conflicts created by predation on livestock, or provide supplemental forage in times of drought to assist area livestock operators and lessen the resource impacts of grazing.

### 3.27.3 Assumptions

With all quantitative and qualitative analysis, the following assumptions are used to determine the degree of impacts on livestock grazing. These assumptions are based on previous assessments, professional judgment, and FS Range Management Directives.

- Livestock grazing would be managed to meet specific standards and guidelines for rangeland health, including riparian standards and guidelines. In addition, range improvements would be used to meet standards and guidelines for rangeland health and achieve rangeland management goals.
- The grazing system in each allotment would remain the same and permitted HMs for each allotment is not expected to increase or decrease unless changed through a site-specific analysis or allotment management plan update.
- Impacts on livestock grazing would be the result of activities that affect forage levels or the limiting of access to designated allotments such that livestock could no longer use rangelands.
- Mitigations for impacts to, or from, livestock would be addressed in a site-specific analysis.

### 3.27.4 Best available scientific information used

The science of assessing rangelands is evolving as certain concepts and ecological processes are becoming better understood (Pellant, Shaver, Pyke, & Herrick, 2000). General concepts for maintaining or moving towards desired rangeland condition will focus on aspects of ground cover, species composition and the presence or absence of invasive species as indicators.

Information sources include current scientific literature, FS reports and databases, and personal knowledge of Helena-Lewis and Clark NF employees. Data used to analyze the existing condition for livestock grazing and the rangeland resource came from the following sources:

- FS Natural Resource Manager Database (includes grazing allotment, permitted use, range capability, range improvement, and range vegetation plot data).
- Completed range analyses (includes range vegetation inventory and assessment data).

### 3.27.5 Affected environment

#### Permitted livestock grazing use

Grazing is widespread across the HLC NF (Table 251) and occurs in each GA, as shown in Table 252. Active grazing allotments occupy approximately 50 percent of the NFS lands on the Lewis and Clark NF, and 65 percent on the Helena NF. Grazing allotments are more prevalent in some GAs than others. The Forest annually permits approximately 24,000 cattle, 5,000 sheep, and 80 horses for over 90,000 head months of grazing use. A head month is defined as one month's use and occupancy of the range by one animal (weaned or adult cow with or without calf, bull, steer, heifer, horse, burro, or mule, or 5 sheep or goats), and is used primarily for FS grazing fee calculations.

**Table 251. HLC NF grazing allotment summary**

Allotment information	Number or acres
Number of grazing permittees (permit entities)	234
Number of active allotments	240
Number of vacant allotments (number)	12
Number of closed allotments	23
Acres (total) of active allotment acres	1,419,085
Acres of active allotment NFS	1,379,819
Acres of active allotment waived (private)	39,266

**Table 252. Grazing allotments by GA**

GA	Active allotments	2019 permitted head months	Grazing allotment acres	% of the GA
Big Belts	32	19,252	233,851	52
Castles	12	6,845	56,315	71
Crazies	11	4,620	59,539	85
Divide	23	8,501	134,425	58
Elkhorns	11	7,903	90,506	52
Highwoods	9	5,750	40,680	92
Little Belts	79	20,412	502,867	56
Rocky Mountain Range	26	6,755	175,547	22

GA	Active allotments	2019 permitted head months	Grazing allotment acres	% of the GA
Snowies	22	4,976	57,227	47
Upper Blackfoot	15	6,719	77,991	22

Commercial livestock grazing on NFS lands is considered a privilege and authorized through the issuance of a term (i.e., 10-year) grazing permit. Term permits include terms and conditions for grazing use and describe the responsibilities of the permit holder. These terms and conditions are also incorporated into an allotment management plan. The allotment management plan establishes site-specific goals and objectives and provides management strategies to maintain or move towards desired condition. Grazing management strategies may include allowable use levels, seasons of use, pasture rotations, and a schedule for implementing range-improvement projects such as fences and water developments. This plan also includes requirements for monitoring and inspections, payment of grazing fees, ownership of livestock and base property, livestock management, range improvement maintenance and construction, and other terms as appropriate. Once approved, the allotment management plan becomes a part of the permit.

The grazing management program helps to ensure a reliable and consistent level of native rangeland forage for permitted commercial livestock production. This resource helps local ranches maintain an economical operation that, in turn, maintain open space adjacent to the forest, which is integral to meeting desired resource conditions and maintaining the economic and social sustainability of local communities.

#### *Rangeland capability and suitability*

Capability is defined in the FS Manual as, “the potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and given level of management intensity.” Capability is an inventory and remains constant throughout the planning process. The NFMA of 1976 requires the identification of the suitability of lands for resource management including grazing. Suitability is defined as, “the appropriateness of applying certain resource management practices to a particular area of land as determined by an analysis of the economic and environmental consequences and alternative uses forgone. A unit of land may be suitable for a variety of individual or combined management practices” (FSM 1905). Once capability is determined, an assessment of suitability is conducted to address whether livestock grazing is or is not compatible with management direction for other uses and values in that area. The assessment also decides which, if any, other uses would be foregone with livestock grazing.

Rangeland specialists estimate that timber canopy closure and conifer encroachment have reduced forage availability by at least 10 percent over the past 60 years on some grazing allotments in the planning area. Analysis of grazing allotments within the Divide and Little Belt Mountain GAs indicates grass/forb understory is decreasing in past timber harvest units due to increasing canopy closure by conifers. In some areas this forage loss is due to the restocking of these harvest units back to lodgepole pine, while in others range managers suggest that this trend in canopy closure and the resulting loss of forage may be due to fire exclusion. In either case, as tree densities and canopy cover increase these rangelands will continue to transition from being suitable to not being suitable for livestock use due to a loss of forage production and/or access to forage.

Based on GIS analysis, 1,733,332 NFS acres were determined to be capable for cattle grazing and 2,458,980 acres were mapped as capable for sheep grazing. Approximately 483,150 acres of NFS lands within the planning area were mapped as suitable for cattle grazing. Site-specific analysis would refine these figures and mapping on a project-level scale.

The HLC NF will use the allotment management planning process to determine additional lands that are not suitable and determine the site-specific permit actions necessary to meet forest plan desired conditions, objectives, and standards. Allotment management plans will also be used to evaluate the twelve allotments

across the Forest that are vacant based on economic or other resource values. The decision whether or not to permanently close, establish a forage reserve, or reallocate these vacant allotments will be made during the allotment management planning process. Determination of rangeland suitability for livestock grazing would be made for these vacant allotments during the AMP analysis.

### *Rangeland condition and trend*

Rangelands comprise a variety of vegetation types, including many timbered plant communities, grasslands, shrublands, and riparian areas. Range condition is an assessment of the current health of the plant communities and soils, often expressed as the degree of similarity or dissimilarity of current plant composition and abundance compared to potential or natural/historic conditions. According to O'Brien et al. (2003), monitoring should document the following attributes in order to determine if range condition is moving towards desired condition at the allotment or pasture level:

- Noxious weeds are absent or are a very minor component of the existing plant community.
- Ground cover provides proper watershed and soil protection for the rangeland site, and bare ground percentages are within the spectrum of ecosystem states and processes that evolved over a long period of time from natural disturbance regimes.
- The composition of desirable shrubs, grasses, and forbs is within the natural range of variation for the rangeland site.

These general concepts were used on the HLC NF to develop an estimate of ecological status of rangeland acres based off existing information and monitoring data. Large-scale Vegetation Classification (O'Hara, Latham, Hessburg, & Smith, 1996) was completed in the 1990s to describe vegetative characteristics and their distribution to stratify herbaceous vegetation into community types and determine ecological status. Additionally, other intensive vegetation plot data was collected prior to 2015 for several range analyses across the Forest.

Analysis of this data, which typifies range conditions across the planning area, determined that approximately 87 percent of sampled areas retain high native species integrity (i.e., potential natural community or high ecological status). Grasslands that have lower amounts of natural community attributes and/or the substantial presence of invasive species (approximately 5 percent of samples) suggest that these plant communities have a low similarity to potential natural community ecological condition. A large portion of the assessment area is susceptible to invasive weeds, and a high risk of continued weed expansion exists.

Ecological status is a rating of the overall condition of the vegetation and soil protection of an ecological site in relation to the potential natural community for the site (Society for Range Management, 1989). Ecological status was rated in four categories based on similarity of the existing species composition to that of the potential natural community. To maintain forest and rangeland ecosystem health, a mix of ecological status classes is desired for dominant habitat types. The potential natural community is the plant species composition that would naturally occur if minimally disturbed. Potential natural community is equal to 76 to 100 percent similarity, high is equal to 51 to 75 percent similarity, mid is equal to 26 to 50 percent similarity, and low is equal to zero to 25 percent similarity. Ecological status may be the result of natural succession, fire, timber harvest, introduced species, grazing, or other disturbances and is in a constant state of transition across the landscape. For example, a community type with a tree overstory is predominantly influenced by the natural succession of trees and fire and grazing of the understory may have some effect on the overall similarity to the potential natural community. On the other hand, grazing may have a dominant influence on the overall similarity of a grassland community type.

Estimated ecological status of rangeland acres of NFS lands within the planning area is shown in Table 253. The table below also reflects the ecological status of rangeland acres within a portion of the Elkhorns GA administered by the Beaverhead-Deerlodge National Forest. Revision of management direction for this area is taking place within the Plan.

**Table 253. Inventoried rangeland acres by ecological status**

Forest	Potential natural community ecological status	High ecological status	Mid ecological status	Low ecological status
HLC NF	1,221,877	373,002	136,837	100,267
Beaverhead-Deerlodge	15,480	4,725	1,734	1,270

Inventoried acres by ecological status represents a snapshot in time of rangeland current conditions. To effectively implement ecosystem management, a reference or benchmark to represent the conditions that fully describe functional ecosystems needs to be developed (Cissel, Swanson, McKee, & Burditt, 1994; Laughlin et al., 2004). Livestock grazing is a major land use component and is one tool which can mimic natural disturbances such as grazing by large herbivores. Weed invasion and conifer encroachment can also rapidly change rangelands within the planning area. Additionally, some areas classified in “low” ecological status are composed primarily of introduced species such as Kentucky bluegrass and common timothy. These conditions could be evaluated against this reference to determine movement towards or departure from desired condition, and from that information, vegetation treatments may be designed or management adjusted to move rangeland vegetation towards natural or native condition (Hessburg, Smith, & Salter, 1999; Swetnam, Allen, & Betancourt, 1999).

To provide a general depiction of current rangeland condition across the planning area, allotment-specific data collected through agency approved methodologies will help determine movement towards or departure from desired rangeland conditions. Historical data and photographs and new monitoring techniques should all be considered in order to develop apparent trends and effects of management changes.

#### *Watershed condition and riparian areas*

The aquatics ecosystems section analyzes current and expected conditions of watersheds, stream habitat, fisheries and soils, as well as existing riparian conditions. The 2012 WCC Framework rated the overall watershed condition across the Forest. 103 watersheds were classified as functioning properly, 159 as functioning at risk, and 34 as impaired. One of the most important drivers of the ratings in the planning area was livestock grazing. These ratings will be reassessed in the future to assess change. Other monitoring data, including PIBO data and forest stream studies have shown livestock impacts to streams and riparian areas are occurring on many stream reaches in the planning area, which is resulting in habitats and water quality that presently do not meet desired conditions. See the aquatic ecosystems section for more discussion.

#### *Riparian areas and annual use indicators*

Grazing strategies that link uplands, riparian areas, and the stream channel can be effective and sustainable to restore riparian areas (Elmore & Kauffman, 1994). Streambank stability is largely a function of the effectiveness of riparian vegetation in filtering overland water flow, trapping sediments, and protecting streambanks from erosion (Kovalchik & Elmore, 1992). Unwise use by livestock is considered a common cause of deteriorated riparian zones in western rangelands (Knopf & Cannon, 1981). In order to address livestock use concerns and provide triggers in which to manage livestock the 1986 Plans incorporated grazing standards that contained annual use indicators. Annual forage use levels by vegetation type and grazing system were prescribed in the Helena NF Plan and total physical bank damage on key areas were set at 30 percent in the Lewis and Clark NF Plan. The 1986 Forest Plans encouraged the incorporation of new research results and management techniques in allotment management plans to help improve riparian areas.

To sustain riparian vegetation, which protects water quality, herbaceous utilization, stubble heights that vary by vegetation type, and limiting utilization of riparian shrubs are indicators to monitor (Mosley, Bunting, & Manoukian, 1999). Recommendations by Clary and Webster (1990) called for residual stubble or regrowth of at least 4 to 6 inches in height to provide plant vigor maintenance, bank protection and sediment entrapment. Utilization of streamside herbaceous forage should be an additional indicator and vary by the season of use.

Improper livestock grazing can have numerous direct and indirect effects on soil infiltration by trampling, compaction and loss of vegetation cover on both upland and riparian sites. Impacts are often greater in riparian zones because livestock seek shade, water, and succulent vegetation in which these areas provide. (Andrew, Steven, Wayne, Trlica, & Clary, 2004) Pelster et al. (2004) found that willow consumption increased as herbaceous stubble height approached 10 and 18 cm during the spring and early-summer grazing season within mountain riparian communities. Overuse by livestock in riparian zones can reduce bank stability through vegetation removal and bank trampling, increase soil compaction and sedimentation, cause stream widening or down cutting, and can change vegetation composition (Platt, 1991).

Two typically used grazing monitoring indicators are within grazing season trigger points and the end of season guidelines. Within season annual indicators are normally used to trigger or indicate when it is time to remove livestock from a given area so that end of season guidelines, usually in the form of an allowable use level, can be met. End of season annual indicators are used to determine if management for that particular unit and season has been satisfactory. End of season annual indicators may also indicate that management is not meeting or moving towards desired conditions and thus changes to management should be considered prior to the next operating season.

While no one method works for all riparian areas, stubble height has been extensively studied and is widely put in practice as a trigger for cattle movement or end of season monitoring indicator (Clary & Leininger, 2000; Clary & Webster, 1990; Goss & Roper, 2018). End of season stubble height of greenline vegetation has been shown to be a good indicator of two primary factors: 1) the effect of grazing on the physiological health of herbaceous, hydrophytic plants, and 2) the ability of the vegetation to provide streambank protection and bank building function. Stubble height criteria should be used where streambank stability is dependent upon herbaceous plants. Alternatively, woody plant utilization or streambank alteration could be used as a management guide in situations where streambank stability is controlled by substrate or the stream is deeply incised (Clary & Kinney, 2002).

According to Clary and Webster (1990) the level of forage use occurring on a site, including riparian areas, is the most important consideration to manage livestock appropriately on western rangelands. Rangelands comprised of upland plant communities and the riparian areas are complex systems with many factors contributing to their development and resiliency. Physical factors such as stream type, geology, climate, and elevation greatly influence the recovery of riparian areas. Specific management action must be made to fit local conditions (Clary & Webster, 1990), which also includes selecting annual use indicators that match the resource goals of a riparian site. Riparian grazing plans should be site-specific and based upon the best research and evidence available to maintain and enhance vegetation and protect streambanks (Mosley et al., 1999). Kovalchik and Elmore (1992) recommended carefully designed grazing systems to maintain diversity of plant associations in riparian communities along stream reaches.

### *Invasive and nonnative species*

The HLC NF faces two large challenges related to nonnative rangeland species: noxious weeds that decrease forage availability and native species diversity; and nonnative invasive forage species such as Kentucky bluegrass, smooth brome, and timothy. All three of these forage species were intentionally introduced for hay or forage production but have escaped cultivation and have out-competed native plant communities across the HLC NF. Invasive forage species can substantially affect the structure and diversity of plant communities, as well as the seasonal palatability on some grazing allotments. Maintaining intact native bunchgrass communities can be the effective biotic resistance and reduce the magnitude invasive plants (Chambers, Roundy, Blank, Meyer, & Whittaker, 2007; Prevey, Germino, & Huntly, 2010).

### *Revisions of allotment management plans*

The HLC NF is operating under a schedule to revise and update allotment management plans tied to the Rescissions Act of 1995 (Public Law 104-19) Section 504(a), which requires each NFS unit to identify all



allotments for which NEPA analysis is needed. These allotments must be included in a schedule that sets a due date for the completion of the requisite NEPA analysis. Since the 1986 Forest Plans were completed, and following the Rescissions Act (1995), 158 allotments out of the HLC NF's 240 allotments have had management plans updated. The remaining 82 allotments require allotment management plan revisions and would follow new forest plan components for livestock grazing. Allotments that have had AMPs revised under the Rescissions Act would still be subject to forest plan direction through administrative modification of the term grazing permit (FSH 2209.13, Chapter 10, Section 11), reissuance of existing term permits, issuance of new term grazing permits, and/or as AMP revisions and sufficiency reviews occur.

### ***3.27.6 Environmental consequences***

#### **Effects common to all alternatives**

Livestock that use rangelands can remove plant material, trample soils, and alter water flow patterns. However, with proper management (rest and recovery) these impacts are not substantial when compared with the natural resilience of ecosystems (Chambers, Allen, & Cushman, 2019). For the foreseeable future, management under any of the alternatives would continue to provide forage production and productive livestock grazing. Acres available for livestock grazing and permitted head months would be the same under all alternatives. None of the alternatives change existing allotment management nor do they provide any specific direction regarding current livestock management. No allotments or portions of allotments are proposed to be formally closed to grazing due to other resource needs. Under all alternatives, changes to livestock management and allowable forage use levels at the site-specific scale would be made during allotment management plan revision. Grazing use would be managed similarly in all alternatives.

#### ***Permitted livestock use***

Plan components for the protection of the aquatic resources, particularly riparian areas, have had some of the greatest impact on the Forest's grazing program. Emphasis on improving riparian conditions is expected to continue under all alternatives. Revisions of allotment management plans would continue to implement BMPs and identify allowable use levels that are expected to move riparian areas towards desired conditions. Management adjustments may result in a loss of permitted head months for some permittees. Current vacant grazing allotments would most likely be used as forage reserves for allotments affected by fire, depredation, threatened and endangered species, or riparian management issues. Increases in forage quality or quantity from transitory range or fuels projects, combined with range improvements, would most likely help redistribute grazing use away from riparian areas. Therefore, it is unlikely that permitted head months would be increased through the opening of new allotments under any alternative.

#### ***Rangeland suitability***

Conifer canopy closure, conifer/shrub encroachment into grasslands, and the spread of invasive plants all can reduce available forage for livestock. The degree to which future management actions address each of these ecological processes would influence the potential loss or increase in available forage. Fire and physical manipulation of the tree overstory may help to maintain or increase forage productivity for browsing and grazing ungulates. Development of rotation grazing systems versus season long grazing can have very positive effects on establishment of desired native vegetation. Treatment of invasive weeds can allow desired natural plant communities to flourish. Resource specialists predict that permitted livestock numbers may decline in some areas due to more stringent management constraints for riparian areas as well as the loss of forage from invasive weed spread, and encroachment of conifers into some grassland communities. However, vegetation modeling (as discussed in the terrestrial vegetation section) indicates that the extent of nonforested plant communities overall would likely remain constant under all alternatives, and further, that forest densities may decrease. This may result in increased forage in some forested areas.

No alternative proposes to change allotment boundaries, or formally close open or vacant allotments. Therefore, existing suitable acres would not change between any of the alternatives. A suitability analysis is

done during allotment management plan revision and site-specific suitability determinations would be made at that time.

### *Climate change*

Over the life of the plan certain environmental influences may negatively impact rangeland health and forage production. If climatic temperatures continue to increase, there may be changes in vegetation where there is a shifting from more mesic (moist) plant associations to more xeric (dry) communities that are better adapted to the drier sites. As a result, it is expected that bare ground would increase within these plant communities as rangeland sites become drier during extended periods of drought (Pellant, Abbey, & Karl, 2004). Elevation will play a large role in plant species composition in conjunction with predicted climate change. High elevation, alpine or other fringe type environments may see plant species composition change first (Murphy & Weiss, 1992). Invasive weeds would likely continue to spread and increase in abundance and density. Timber canopy may continue to close in areas where wildfires or other disturbances do not occur, and some grasslands/shrublands may see additional conifer encroachment and conversion to a conifer-dominated community. Conversely, there is potential that wildfire may play a larger role in shaping vegetation in some areas, perhaps promoting nonforested vegetation communities, particularly given warmer climate regimes. Transitory range acreage may fluctuate as forested stands become more open due to harvest, insects, disease, and/or fire. Over time and through succession, forest canopies would likely close in once again until the next disturbance.

Climate change affects vegetation, which in turn could affect livestock grazing. Potential effects include, but are not limited to, changes in type, amount, and distribution of precipitation, which directly affects type, abundance and distribution of vegetation. Reeves et al (2017) noted that northern regions above 39° north latitude could have periods of favorable production but could be offset by increases in heat stress and forage variability. Lower-elevation grasslands and shrubland habitat are expected to become drier and habitat zones shift upward in elevation (Finch, 2012). The result of these potential changes could be an increase in suitable cattle forage, thereby causing increased suitable forage for cattle grazing at higher elevations within an allotment. On the other hand, lower elevation rangeland and upland plant communities would be expected to senesce earlier in the season, resulting in reduced palatability earlier in the grazing season. Reduced palatability in the uplands, combined with warmer temperatures would affect livestock distribution by concentrating livestock in riparian and wetland areas. Riparian use levels would be met earlier in the season, thus forcing livestock to be removed from an allotment or pasture earlier than the permitted off date.

Increases in atmospheric carbon levels and higher temperatures would likely make invasive species, especially annual grasses, more competitive and adaptable, which may allow some species to expand to higher elevations as well as become more difficult to control due to reduced chemical efficacy (Ziska, Faulkner, & Lydon, 2004). Not only will some species become more invasive, but the array of species would continue to change (Scott, Mahalovich, Rinehart, & Krueger, 2013).

It is possible for climate change to impact resource use within a short timeframe, which could change the suitability and utilization of forage. For example, there have been periods of increased summer temperature and decreased summer precipitation over a 15- to 20-year planning period which would indicate that the potential for changes in the suitability and utilization of forage within a grazing allotment may change within a planning period. This could cause beneficial or negative impacts to the permitted use of a grazing allotment for suitability and utilization. Annual fluctuations of temperatures and precipitation would affect forage palatability under all alternatives.

With the recent history, and recurring nature of drought and its relationship to climate change, managers must understand the range of its effects on natural and managed lands, know techniques to reduce species and ecosystem vulnerability to drought, and have information available that will assist in recovering natural and managed systems from the impacts of drought (Vose, Clark, Luce, & Patel-Weyand, 2016). Although managers of rangelands are already experienced with harsh and variable conditions, they may not be prepared

for the accelerating and exacerbating impacts under future climate change (Ash, Thornton, Stokes, & Chuluun, 2012). Though the impacts to livestock grazing from climate change remain to be fully understood or experienced by permittees of the HLC NF, the FS has administrative tools to adapt to unexpected conditions as well as short and long-term changes in resource conditions. Examples of administrative changes include stocking adjustments and adjusting management practices. The impact of climate change to livestock grazing could include limited use of allotments due to less available forage and/or rapid seasonal changes in palatability. Cattle operations will most likely need to increase flexibility for uncertainty, variability, and increasing stress from individual factors in the face of changing climate. See section 3.30 Carbon and Climate for more discussion.

#### *Effects of plan components associated with:*

##### **Wildlife habitat management**

Grazing livestock share habitat resources with big game species. Big game grazing and browsing is compatible with livestock grazing and browsing. There is a large dietary overlap (40 to 80 percent) between elk and cattle and a similar though smaller dietary overlap with deer (Hansen & Reid, 1975; Wallmo, Gill, Carpenter, & Reichert, 1973). Elk grazing patterns have been shown to be strongly influenced by livestock grazing, as they seek areas of forage regrowth following grazing by livestock (Crane, Mosley, Brewer, Torstenson, & Tess, 2001). On the other hand, livestock grazing, and associated permit administration may temporarily displace wildlife, especially elk, from choice foraging areas within a pasture. Competing use for forage and wildlife displacement would be considered and possibly mitigated when developing an allotment management plan, especially in elk calving areas or areas popular for wildlife viewing or big game hunting.

Current forest plans and allotment management plans for most HLC NF allotments identify and manage for wildlife forage needs, such as crucial winter range, as well as considered effective separation between domestic sheep and bighorn sheep to avoid disease transmission. These management practices would continue under all alternatives. Allotment management plans have adjusted grazing management accordingly where allotment boundaries overlap with known big game winter range by having rest pastures in the rotation or attempting to increase livestock distribution, thus decreasing livestock use in areas of concern. In certain site-specific cases, such as localized population fluctuations or a distribution shift due to habitat loss on historic winter range, future limitations could be placed on forage use by permitted livestock through the allotment management plan revision process to assure adequate forage for the wild ungulate populations. Most allotments would have the flexibility to adjust livestock distribution if needed for adequate winter range forage. Upland use levels are rarely exceeded, let alone approached on most HLC NF allotments, as riparian areas primarily drive management actions. Plan components associated with big game habitat management may have an effect on permitted livestock grazing, primarily through encouraging management tactics to improve riparian areas.

##### **Grizzly bear habitat management**

All alternatives would retain the plan components from the 2018 Forest Plan Amendments to Incorporate Habitat Management Direction for the Northern Continental Divide Ecosystem Grizzly Bear Population. Potential for grizzly bear-livestock conflicts exist where grizzly bear habitat and livestock operations overlap on both NFS lands as well as outside the Forest boundary. Historically, grizzly bear and livestock conflicts have been rare on NFS lands under current management. The 1986 Lewis and Clark NF Plan did address livestock/grizzly bear interactions with two standards that are similar to the strategy: Management Standard D4 – livestock grazing restrictions (5) “Administer provisions of the ESA in occupied threatened and endangered species habitat will use the Interagency Wildlife Guidelines to avoid or mitigate conflicts between livestock grazing and threatened and endangered species” and (6) “Grazing which affects grizzly bears and/or their habitat will be made compatible with grizzly needs or such uses will be disallowed or eliminated.” Retention of the plan components from the 2018 Forest Plan Amendments to Incorporate Habitat Management Direction for the Northern Continental Divide Ecosystem Grizzly Bear Population would apply to allotments within the primary conservation area on both the Lincoln and Rocky Mountain Ranger Districts.

The HLC NF would continue to allow livestock grazing in the twenty-five active and two inactive allotments, but no increase would be allowed in the number of permitted cattle or sheep allotments or permitted head months within the grizzly bear primary conservation area. Within the primary conservation area, twenty-four allotments are permitted for 9,241 AUMs or 7,489 HMs of cattle grazing, with one allotment on the Lincoln Ranger District permitted for 79 AUMs or 395 HMs of sheep grazing.

Potential for grizzly bear-livestock conflicts is expected to be mitigated to the best possible extent while continuing to authorize permitted livestock grazing under the action alternatives. Mitigations include implementation of standards and guidelines found within the strategy, and BMPs such as capping permitted livestock numbers on allotments, managing livestock carcasses when found, and prohibiting boneyards on NFS lands. Implementing a range rider program and having the ability to track collared bears could be other options to be proactive at keeping separation between grizzlies and livestock. Vacant allotments could be added or used in conjunction with existing active allotments without increasing permitted numbers even though the area available to graze is greater. This would give the permittee more places to move livestock to avoid bear-livestock encounters. These strategies benefit existing permittees, even though they may not maintain AUM production.

Conflicts between grizzly bears and livestock on NFS lands within the planning area have been sporadic. However, no matter what the strategy or alternative selected, having a sustainable population of grizzlies in the same mountain ranges as permitted livestock would probably result in depredation of livestock at some point. This may increase operating costs and psychological stress for permittees, as some level of livestock death loss would be inevitable under all alternatives.

### **Northern Rockies Lynx Management Direction**

Action alternatives retain direction for managing Canada Lynx habitat from the March 2007 Record of Decision for the Northern Rockies Lynx Management Direction, which provides guidelines for grazing management. Livestock grazing may reduce or eliminate foraging habitats in areas that grow quaking aspen and willow in riparian areas, but no information indicates that grazing poses a threat to overall lynx populations (U.S. Department of Agriculture, Forest Service, 2007c). Appropriate grazing management can rejuvenate and increase forage and browse in key habitats such as riparian areas. Guidelines are designed to minimize potential adverse effects and improve habitat conditions. FWS found in the analysis in the BO for the NRLMD that application of the measures in most cases, had no effects or discountable effects to lynx (U.S. Department of the Interior, Fish and Wildlife Service, 2007).

### **Recreation management**

Recreation use of NFS lands in the planning area is expected to increase. Recreation management can alter livestock grazing in several ways. Achieving reasonably uniform livestock distribution across an allotment is one objective of livestock management because it allows the optimal use of available forage. Areas with concentrated human activity are generally avoided by livestock. Concentrated or frequent recreation use along roads and near popular areas can cause livestock to avoid grazing or passing through an area and work directly against a permittee's attempts to distribute livestock evenly. People using camping or picnic sites on the forest sometimes become concerned with livestock in and around their recreation sites. Cattle are occasionally shot by forest users, or struck and injured, or killed by vehicles, resulting in a direct economic loss.

Archery hunting has become very popular since the 1986 Plans were signed. Archery hunting season generally coincides with the last month of the grazing season (September/first half of October). Hunting pressure has and will continue to affect livestock dispersion in both upland and riparian areas under all alternatives. Livestock on public lands may be seen as a competing use to the provision of quality archery hunting opportunities on NFS lands with some member of the general public. Livestock are generally off the Forest when the general rifle season opens in late October.

Fences are a common solution to control livestock but require installation and maintenance and can be costly. Fencing of roadways may result in a safer travel way for motorists and livestock, but also result in a loss of forage available to permitted livestock. Right-of-way fence can either disrupt planned grazing management or it can increase the management flexibility by creating additional pastures. Higher levels of summer recreation could create increased levels of potential conflicts with livestock grazing, and oftentimes may complicate livestock management and make it more expensive (e.g., more gates may be left open and livestock inadvertently or purposely moved). Winter recreation and motorized over-snow vehicle use would not impact livestock grazing because the permitted grazing season would not occur during the winter months.

Increased recreational uses of NFS lands within the planning area would most likely make grazing on the Forest more expensive for permittees under any alternative. Livestock allotments are most often located within the roaded landscapes on the HLC NF. Increased traffic on roads and trails in these areas would make it more difficult to keep livestock in scheduled pastures as gates may get left open and cause livestock to stray. With expected increases in visitation to easily accessible NFS lands vehicle collisions with livestock on system roadways and vandalism to range improvement infrastructure are likely to increase. These effects from recreational use would be the same under all alternatives.

### **Cultural resources management**

Livestock can contribute to the deterioration of cultural and historical resources through physical contact (e.g., hoof action, rubbing on structures) or by contributing organic matter to a site. They can remove or alter vegetation that protects sites from erosion and make these resources more visible for unauthorized collection. In cases where the level of impact is unacceptable, the impacts can be mitigated with fencing or with changes in management (intensity or timing). Under all alternatives, plan components are in place to ensure the protection of cultural and historic sites and resources. If livestock are excluded from a site or forage use levels are reduced, total AUMs on an allotment may be reduced, which limits a site's suitability and utilization. The potential for these effects is the same for all alternatives.

### **Fire and fuels management**

Widespread reductions in fire frequency and extent followed by livestock grazing have resulted in increased shrub cover, loss of herbaceous understory, and increased rates of woodland encroachment on many western rangelands (Knick, Holmes, & Miller, 2005). Fire and fuels management can have different short-term and long-term effects on vegetation and wildlife diversity, as well on livestock grazing. Effects depend upon burning conditions and burn type, and the results and timing of a wildfire are much less predictable than from a controlled burn/prescribed fire.

Prescribed burning often results in an increase in forage production and availability, and a shrub community more compatible with a variety of wildlife species. A reduction in shrub and conifer density could potentially accelerate the recycling of nutrients and make water more accessible across the landscape, such as in springs, seeps, and intermittent streams. Both wildland and prescribed fire can increase suitable rangeland on an allotment which in turn can simplify livestock management, improve livestock or wildlife distribution, and increase available AUMs. Under-burns in conifers or other types of burns can increase forage production and accessibility. Areas that are typically grazed may have use deferred for up to two growing seasons following a prescribed burn to allow for vegetative recovery. Rest from grazing use requires that the permittee be flexible in management and involved in considerable advance planning and coordination. If a prescribed fire does not take place on schedule, arrangements may need to be made again in successive attempts, which can accrue additional costs to the permittees and/or FS.

A wildfire can have similar effects as prescribed fire but is likely to have unplanned adverse effects as well. Wildfire may result in the entirety of an allotment being burned, resulting in forage unavailability, with permittees being forced to move livestock to other lands in their operation (e.g., private, state). On rare occasions, large, quick-moving wildfires may also overrun livestock that cannot escape, which results in direct financial loss for a permittee. Wildfire may remove trees and open forest understories to a flush of grass and

forb production for many years. Like prescribed fire, wildfires can have the effect of recycling nutrients and improving the quality and quantity of forage for livestock and wildlife. However, since timing, location, and burn conditions are not controllable, wildfires are less likely to provide the same amount of positive effects as prescribed burns.

To evaluate the potential impact of fire on livestock grazing, the projected acres of prescribed fire and wildfire are used to determine areas most likely to create more suitable forage. As shown in the terrestrial vegetation section, the projected acres of wildfire range from about 100,000 to 175,000 acres per decade over the next 50 years and are similar for all alternatives. Projected prescribed burning acres on forested lands are similar for alternatives A, B, C, D, and F and less in alternative E depending on the decade. The location of prescribed fire treatments is not known, and the model did not include nonforested plant communities.

Fire would need to be within an existing allotment to affect the number of acres that could be considered suitable for livestock grazing. The differences in the expected acreages of wildfire and prescribed fire are negligible at the forestwide scale, and therefore the potential effects would be similar across all alternatives. All alternatives have plan components that are generally permissive to the use of prescribed fire on the landscape.

### **Aquatic threatened, endangered, proposed, candidate, and species of conservation concern**

Protection of threatened or endangered species habitat may have the largest influence on livestock grazing on Federal lands. Some permittees could be economically affected if conditions on their federal allotment require more intensive management actions or a reduction in stocking in order to manage for improved riparian and at-risk aquatic species habitat. In many cases regarding aquatic and riparian habitat improvement needs, changes in livestock management may require constructing new range improvements, adjusting forage use levels, and/or increasing herding efforts in addition to routine management practices. All these actions cumulatively increase the overall permit administration cost for a grazing permittee. Intensive management can generally be successful in moving resource conditions towards desired condition, but instances may arise where reduced stocking levels are also needed. At this time, predicting any future reductions are outside the scope of this analysis but would be addressed with an analysis if species are listed.

### **Terrestrial vegetation management**

Opportunities for vegetation management that include reducing Douglas-fir encroachment and restoring aspen stands would have beneficial effects on livestock grazing. The predominant understory vegetation in Douglas-fir encroachment areas would respond favorably to conifer removal and provide forage for livestock and big game. A flush of forbs and grasses occurs especially after a prescribed burn and to a lesser extent after other conifer removal methods. The increase in production in these cases can last for many years or even decades. Aspen restoration would also increase forage, but treatments must account for the potential for heavy browsing. Cattle may be fenced from treatment areas, or pastures placed in nonuse until saplings escape the browse zone from livestock and wildlife. Once aspen stands have recovered, understory vegetation would be favorable for providing forage for livestock and wildlife.

All alternatives have similar potential to promote aspen and reduce conifer encroachment, although the action alternatives have more explicit desired conditions related to aspen and nonforested plant communities. Vegetation modeling shows similar expected trends for most attributes of terrestrial vegetation across the alternatives.

### **Designated wilderness**

Livestock grazing “and activities and the necessary facilities to support a livestock grazing program, would be permitted to continue in NF wilderness areas, when such grazing was established prior to classification of an area as wilderness” in accordance with Congressional Grazing Guidelines” (FSM 2323.2, WO Amendment 2300-90-2). There is to be “no curtailment of grazing permits or privileges in an area simply because it is designated wilderness.” Wilderness designation should not prevent the maintenance of existing fence or other

livestock improvements, not the construction and maintenance of new fences or improvements which are consistent with allotment management plans and/or which are necessary for the protection of the range.” However, travel variances would need to be issued to permittees for motorized access in order to administer their allotments and would also be subject to line officer approval. In some instances, added time to receive the variance and do the job could be expected. Variances could also be denied if conflicts with other Forest users were identified, which would require permittees to conduct administration via nonmotorized means.

Wilderness is designated by congress. The three designated wilderness areas on the HLC NF are the Gates of the Mountains, the Bob-Marshall, and the Scapegoat Wildernesses. These designations would be the same for all alternatives.

### **Recreation access**

Travel planning has been completed on the HLC NF, but travel plans are designed to adapt to changing conditions and adjust as needed in order to manage motorized use in accordance with other resource needs. The impact to livestock grazing from recreation and travel management is mainly limited by the grazing permit holder’s ability to use motor vehicles to access the allotment. Motorized vehicle access to areas allocated for nonmotorized settings can be authorized by line officers. These decisions are discretionary and are made on a case-by-case review of the proposal and circumstances. The intent of the nonmotorized areas is not to prevent allotment management as some of the motorized vehicle access needs include transportation of fence and/or water development materials, noxious weed control, and salt distribution. During times of the year, or as some routes grow in with vegetation from the lack of use or maintenance; vehicle access may be more restrictive than what is currently available under all alternatives.

### **Invasive Plant Species**

Noxious and invasive weeds have the potential to substantially decrease livestock forage when left unchecked. The impact of noxious and invasive species management on livestock grazing is evaluated based on a qualitative assessment. Impacts are similar between all alternatives, including the no-action alternative. Noxious weed management would continue under direction of both the Helena NF Weed EIS (2006) and the Lewis and Clark NF Weed EIS (1994), until revised. Infestation levels of invasive plants would likely remain steady to slightly increasing over time. Some species may contract in density as new treatment and biological options become available, while other weeds would expand in range and density. All action alternatives would formalize the need to adopt and authorize the best available tools for weed management, but the same tools can also be pursued under current management. Action alternatives may be more favorable in the long term for overall management direction for invasive species, but in regard to effects on livestock forage, no notable difference would be present between the alternatives.

Under all alternatives, management of invasive species is not expected to affect current permitted livestock numbers, range suitability, and forage use on grazing. Current and foreseeable treatment options for noxious and invasive species are adequate to maintain livestock forage production on grazing allotments. However, weed treatments would need to continue to evolve in order to manage new weed species, expanding infestations, and possible herbicide resistance under all alternatives.

Minor inconveniences for grazing permit administration may occur under all alternatives for weed prevention and treatments. Access to areas may be temporarily closed or delayed for weed management activities. Also, mitigations such as washing vehicles or equipment entering NFS lands or restricting off-road travel may be used as part of the grazing permit and allotment plan. These actions may temporarily limit access but would have positive effects for rangeland vegetation and livestock forage under all alternatives.

### **Effects common to all action alternatives**

The plan components developed for the Plan are the same for all action alternatives, and are designed to protect upland and riparian resources, manage noxious weeds, and maintain adequate levels of forage (Table 254). Furthermore, there are resource mitigations and BMPs that are part of allotment plans designed to protect

forest resources from potential disturbances by livestock grazing. These elements are site-specific for each allotment and not part of this analysis. The no-action alternative prescribes grazing standards for allotments with outdated allotment management plans but defer to developing these annual use indicators at the allotment management plan revision level in order to implement the best site-specific standards to move riparian areas towards desired conditions.

**Table 254. Summary of plan components for livestock grazing—alternatives B, C, D, E, and F**

Plan component(s)	Summary of expected effects
FW-RMZ-DC, STD and GDL	RMZ standards and guidelines would impact livestock grazing, including direction regarding RMZs and certain activities within these zones. Collectively these components may limit grazing in some riparian areas.
FW-SOILS-STD and GDL	Soil standards and guidelines would place limitations on detrimental soil conditions. These measures may place limitations on grazing, but conversely would result in protecting soil productivity and therefore would help provide for better range conditions in the long term.
FW-GRAZ-DCs	Desired conditions for livestock grazing emphasize sustainable grazing, stable soils, diverse vegetation and native plant communities, as well as riparian and wetland health. Movement toward these conditions would be achieved through implementation of the standards and guidelines for grazing and the other resource areas. Necessary changes to meet DCs would be implemented at the allotment management plan/project level.
FW-GRAZ-STDs and GDLs	Would affect how allotment planning is implemented. Collectively with the additional RMZ plan components mentioned above, the allotment management planning process will be guided by this guidance so that future grazing will move resource conditions within allotments toward desired conditions.

### Alternative A, no action

The existing 1986 Forest Plans, with permit and/or contract-specific terms and conditions, provide the current direction being used by the HLC NF to address livestock grazing. Forage use levels prescribed for specific grazing systems (U.S. Department of Agriculture, Forest Service, Helena National Forest, 1986) would guide management for allotments without current allotment management plans on all other Helena NF allotments. Lewis and Clark NF allotments would follow guidance under the (U.S. Department of Agriculture, Forest Service, Lewis and Clark National Forest, 1986) which implements a 30 percent bank alteration standard on all fish-bearing streams. On Helena NF allotments west of the Continental Divide, INFISH (1996) grazing standards which prescribe annual use indicators focused on maintaining or improving riparian conditions would continue to guide livestock management on NFS lands.

Alternative A may be the least restrictive for livestock grazing use, especially east of the Continental Divide, based on plan components associated with riparian areas.

Under the 1986 Helena and the Lewis and Clark NF Plans, management direction focused on authorizing livestock grazing on forest allotments while trying to improve rangeland and riparian condition through increasing livestock distribution. The Lewis and Clark NF plan outlined developing allotment management plans that incorporated BMPs such as off-site water developments, grazing systems, and accounted for new research and management techniques to improve riparian areas. Site-specific standards, such as total physical bank damage on key areas in excess of 30 percent, and excessive grass/forb use were identified as factors which indicated damaging livestock use to fisheries habitat. The Lewis and Clark 1986 Forest Plan identified an average annual use level at 71,000 AUMs, with the potential to increase up to 90,000 AUMs as transitory range became available post-timber harvest. Use levels have remained relatively static on the Forest and have not increased due to low timber harvest acreage and riparian and aquatic concerns. Allotment range improvements have helped maintain AUMs and aide in distribution in some areas under the current plan. HMs would be expected to remain stable to slightly decreasing as more allotment management plans are updated and improved management systems are put in place in order to move riparian areas toward desired conditions.



Although allowable use levels were stated in existing 1986 plans, position vacancies and funding deficiencies for rangeland administration have not allowed for 100 percent compliance checks on all allotments every year. Therefore, it is difficult to determine as to whether annual use indicators need adjustment or if monitoring and management responses from the results have lagged which have resulted in desired conditions not being met. Under this alternative, livestock use and disturbance levels in the 1986 plans would continue to be implemented until site-specific use indicators determined during an allotment management plan revision, which would most likely be more stringent than current management for many allotments.

In summary, under the no-action alternative grazing management as outlined in the affected environment section would continue, with revisions of allotment management plans and associated protections for other resources following guidance from the 1986 plans. Grazing management would continue to provide the livestock head months authorized in term FS grazing permits. The 1986 plans allowed for increasing the amount of AUMs across the Forests, mainly from the transitory range being created from timber harvest, although riparian and aquatic concerns would most likely keep permitted head months stable. The quantity and size of grazing allotments could change from the current condition. Additional grazing allotments could be added if they were to meet the goals and guidelines of the existing management areas.

### Effects that vary by alternative

In the short term, all alternatives are designed to maintain forage production and livestock grazing. All alternatives have similar vegetation treatment levels, which could be favorable for grazing permittees as herbaceous forage should temporarily increase after treatments. Alternative D would not reduce livestock grazing, but would have the most area in RWAs, where access for permittees could be more limited or require authorization in regard to the use of motor vehicles for permit administration.

### *Rangeland condition and trend*

Rangeland condition and trend is measured through implementation and effectiveness monitoring of allotment management plans by methods outlined in FSH 2209.21. Monitoring determines if rangeland acres are meeting, departing from, or moving towards desired rangeland conditions in livestock grazing allotments.

Infestations of noxious weeds can substantially impact livestock grazing if they are extensive enough to reduce the amount of available forage. Any ground-disturbing activity has the potential to expose a site to noxious and invasive plants, particularly when motor vehicles are involved. Conversely, established motorized access can make noxious and invasive plant treatment much easier and cost effective. Even though grazing can be used as a noxious weed and invasive species control mechanism, risk of spreading undesired species to other areas within the forest remains an issue without the use of mitigations, such as quarantine or cleaning livestock before and after they have been in an area known to be infested with undesired species. The alternatives vary slightly in their potential for ground disturbing activities such as timber harvest and prescribed fire, with alternative E predicted to have the least amount. Similarly, the potential for motorized access also varies to a very limited extent, based primarily on whether existing motorized uses are suitable in RWAs and the number of new RWAs. However, for both ground-disturbing activities and motorized access, the differences between the alternatives are slight in respect to the potential to impact rangeland condition and trend. These differences are negligible at the programmatic scale.

Action alternatives are expected to move upland and riparian rangeland towards desired conditions. Effects pertaining to riparian areas are described below.

### *Effects of plan components associated with:*

#### **Recommended wilderness**

If RWAs contain active grazing allotments, future grazing management could be impacted. RWA allocation would primarily be administrative in scope for administration of livestock grazing allotments. Some on-the-ground management practices, especially concerning motorized travel, may be subject to increased review for

authorization. Table 255 summarizes the acres of allotments within RWA by alternative. Alternatives A and C allow for existing motorized uses in RWAs, while alternatives B, D, and F would prohibit those uses. Therefore, a variance may need to be granted for motorized allotment administration in RWAs under alternatives B, D, and F. Alternative E has no RWAs.

Alternative D has the most RWAs and has the most potential to change motorized uses for grazing permit administration. Therefore, alternative D could affect the most grazing permittees in terms of allotment access, operability, and management. Alternative D would not lead to a decrease in permitted HMs but could create an increased operating expense for some affected permittees in terms of added time to manage their allotment(s). However, most of the proposed RWAs are semiremote/primitive and would not result in substantial travel or access changes as a result of a RWA allocation. Alternative D would potentially have the largest effect on livestock grazing but would mainly be administrative in nature. Alternatives B, C, and F could also be potentially administratively restrictive for some permittees, but less than alternative D. Alternatives A and E are the least restrictive to allotment administration.

**Table 255. Allotment acres within RWAs by alternative**

<b>Alternative</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
Number of allotments with a portion in RWA	3	35	35	47	0	26
Acres of allotments within RWA	4, 510	63,631	63,631	205,406	0	47,542
Acres of suitable range within RWA	851	15,200	15,200	58,543	0	11,551

RWAs do not affect substantial amounts of suitable rangeland acres in any alternative; however, permittees that have allotments within portions of RWAs, could potentially have increased administrative terms and conditions that make it more difficult to operate as compared to alternatives with less RWA allocation.

### **Vegetation management**

Vegetation management, such as timber harvest and prescribed fire, can provide transitory range that would be available for livestock and wildlife grazing. Transitional range forage capacity decreases over time as the forest overstory grows back and shades out the herbaceous understory. As timber is harvested, areas may open up to livestock that were not previously available thus increasing capable grazing acres. These newly accessible areas would be used as transitory range as long as the acreage occurs within an existing allotment. Timber harvest could also open up range that is inaccessible to livestock because of natural barriers. This could cause livestock control and management problems if the previously unharvested timber stands were used as natural barriers between allotments or other critical area. If this were to occur, additional range improvements would need to be installed to control livestock. In addition, if livestock use is inhibiting regeneration of trees (through trampling or grazing), livestock may need to be temporarily excluded from these areas, which would offset potential gains in transitory range for a time.

The acres suitable for timber production are the most likely to be harvested, although harvest may occur in other areas as well. Acres suitable for timber production are used to compare the relative probability of creating transitory range across alternatives. Alternative E would have the most acres suitable for timber production. However, the actual projected acres of harvest (given a constrained budget) are less under alternative E than alternatives B, C, and F due to an emphasis on harvesting stands that yield more timber volume. Therefore, despite alternative E having more lands suitable for timber production, the impact of actual acres harvested to create transitory range may be greater with alternatives B, C, and F. Alternative F would provide the most transitory range with an annual average of 2,279 acres projected for even-aged regeneration timber harvest in decade 1 of plan implementation.

Transitory rangeland is considered as capable range, but would not be considered as suitable, since conifer regeneration would slowly come back into the harvest units over the next approximately 15 years. Transitory

rangeland would therefore only provide increased forage for approximately a 10 to 20-year timeframe. However transitory range would help grazing allotments by providing increased forage and additional foraging areas which would have been inaccessible or void of herbaceous forage prior to timber harvest. Refer to the timber section for more information on projected timber harvest by alternative.

All alternatives would still provide positive effects for rangeland capability by providing transitory range. Transitory range on some allotments could help improve riparian conditions by providing permitted livestock other areas in which to forage. Some allotments do not contain land suitable for timber production and therefore would not benefit from creation of transitory range.

### **Wildlife habitat management**

Action alternatives require the FS to use the best available scientific information and agency or interagency recommendations to maintain effective separation between domestic and bighorn sheep on both vacant and active sheep allotments with the addition of FW-GRAZ-STD 03, 04. Information is already considered and management techniques are in place to maintain effective separation between domestic and bighorn sheep, and would continue to be standard operating procedures in the future for grazing permittees. Existing domestic sheep allotments currently do not overlap with occupied bighorn sheep habitat, but action alternatives will guide management if conditions change in the future.

While more research exists describing disease relationships from domestic sheep and goats and wild sheep, there are few publications that have linked bighorn bacterial pneumonia outbreaks with cattle. State wildlife agencies have not brought forward any concerns of disease transmission from cattle to bighorn sheep populations within the planning area. Wolfe et al. (2010) examined a bighorn sheep die off in Colorado during the winter of 2007-2008 where they concluded a Pasteurellaceae strain, a disease that is rare in beef cattle, may have been a contributing factor in pneumonia in wild bighorn sheep. However, other respiratory pathogens and severe winter conditions could also have played a part in this case as well. The HLC NF will continue to work with Montana Fish, Wildlife, and Parks to follow guidance from the Bighorn Sheep Conservation Strategy (2010). Forest Service Manual 2255 addresses Cooperation on Animal Diseases. Action alternatives provide plan components that emphasize maintaining low risk for disease transmission between domestic livestock and bighorn sheep herds and also provide the ability for adaptive management application to achieve these desired conditions.

Plan components for wildlife and livestock grazing provide for wildlife habitat needs. FW-GRAZ-GO-01 guides the forest to consider and address wildlife habitat and forage needs with Montana Fish, Wildlife, and Parks biologists during allotment management planning. FW-GRAZ-GDL-04 recommends implementing adaptive management to allow for range improvement and resource protection and to consider the needs and impacts of domestic livestock and wildlife. All action alternatives have livestock grazing and wildlife plan components that place higher emphasis on general and seasonal habitat needs for elk and other big game species than alternative A.

### **Aquatic and riparian resource management**

The aquatics section discusses the effects of plan components on aquatic resources, particularly riparian areas. Management and protection of riparian and wetland resources are emphasized under all alternatives. The watershed, fisheries and soils plan components, under both the no-action alternative (alternative A) and the action alternatives (alternatives B-F) have had and would continue to present some of the greatest challenges to livestock grazing. The objectives and standards for protecting riparian and wetland resources have some of the greatest influences relative to the forest grazing program achieving desired conditions. Changes have been made in grazing management and practices to protect riparian and wetland resources, which are reflected in current resource conditions. Over the last 20 years much has been accomplished through altering grazing practices to protect aquatic resources. This has occurred through allotment management plan revisions throughout the Forest as well as implementation of INFISH standards on a small number of allotments west of

the Continental Divide. Work continues to be done on many HLC NF allotments in order to move toward desired riparian conditions while maintaining an economically viable level of permitted HMs.

All action alternatives would adopt the Plan watershed components along with RMZs plan components, which may be more limiting than current management, especially the implementation of RMZ components east of the Continental Divide. East of the Continental Divide (the majority of the HLC NF), RMZs would result in more acres being subject to riparian area plan components as compared to the no-action alternative. West of the Continental Divide, the area influenced by riparian plan components is the same across all alternatives because RMZs would be defined the same way as riparian habitat conservation zones are in the no-action alternative. GIS mapping of RMZs, utilizing the Plan inner and outer widths within active and vacant allotments for NFS lands only totaled the following: RMZ inner 91,233 acres; RMZ outer 138,522 acres. Site-specific analysis could refine or document changes in RMZ acres at the project level.

Several components, including FW-RMZ-DC-01, 02, FW-RMZ-GDL-12, FW-GRAZ-STD-02, and FW-GRAZ-GDL-01, 07, 08, and 09, could increase the amount of management needed within allotments to meet desired conditions. Based on these components, all future allotment management plan revisions would implement some level of riparian allowable use levels and other BMPs if riparian areas are not meeting desired conditions and to mitigate livestock impacts if they are present.

Some permittees would be able to manage to meet grazing standards with the action alternatives and as a result be able to graze their permitted season and numbers. Impacts to permittees might include increased time, labor, and capital investments in order to consistently meet grazing use levels. Other permittees may not be able to meet standards and may have to reduce livestock use to comply with use levels and new management strategies. The effects of implementing grazing standards on Forest allotments for the purpose of improving aquatic habitat is hard to quantify. Many variables impact the effectiveness of action by the permittee and the agency to comply with grazing standards. Site-specific riparian allowable use levels have proven to be effective tool to move riparian condition in a positive trend as long as a commitment to implement, monitor, and adapt occurs from both the grazing permittee and agency. Overall, effects of aquatic and riparian protections as they relate to livestock grazing would be similar under all action alternatives.

Effects to riparian habitat under the Plan would likely not vary for livestock grazing under any action alternative. Over time, conditions in RMZs as well as aquatic habitat within grazing allotments are expected to improve over current conditions. Refer to the sections on watershed, aquatic habitat, and RMZs for more details.

## Cumulative Effects

Portions of the HLC NF adjoin other NFs, each having its own forest plan. The HLC NF is also intermixed with lands of other ownerships, including private lands, other federal lands, and state lands. The GAs are island mountain ranges and are typically surrounded by private lands.

Timber harvest, grazing, or conversion of rangeland or forests on adjacent lands would affect vegetation conditions at the landscape level, changing composition and structures, and could potentially affect the lands' capability to be grazed. Most public rangelands, both Montana state and BLM lands, should remain undeveloped and suitable for livestock grazing in the foreseeable future. Private lands surrounding the planning area could potentially be affected by conversion to agricultural lands or residential development. Development of these private lands would affect wildlife connectivity and overall landscape function with NFS lands within the planning area. Future development of private lands adjacent to the Forest boundary could also affect the spread of invasive weeds, increase fire protection responsibilities and costs, as well as increasing the complexity of grazing livestock on the Forest in some areas.

The need for a formal agreement has been identified between the BLM and Forest for co-managed allotments within the planning area in order to clarify allotment administration responsibilities and formalize monitoring roles and methodology. An agreement that defines these items will likely be adopted by the BLM field offices

in Lewistown, Butte, and Missoula and the HLC NF within the Plan’s lifetime. A formalized approach for allotment administration between the two agencies is expected to have advantages for management consistency, and increased efficiency and effectiveness for both BLM and FS Range Management Programs. This should lead to annual increases in monitoring on more acres of Federal grazing allotments in the planning area, which ultimately will help determine if movement towards desired conditions in both the 2021 Land Management Plan and Resource Management Plans is occurring.

Some adjacent lands are subject to their own resource management plans. The cumulative effects of these plans in conjunction with the 2021 Land Management Plan are summarized in Table 256, for those plans applicable to the livestock grazing resource.

**Table 256. Summary of cumulative effects to livestock grazing from other resource management plans**

Resource plan	Description and Summary of effects
Blackfeet Nation: Wildland Fire Management Plan (2018)	The Blackfeet Nation’s Wildland Fire Management Plan is a strategic document that contains operational direction designed to guide a full range of fire management activities on a unit or area supported by land management plans. Direction would generally be complementary to the plan components in the 2021 Land Management Plan in recognizing livestock grazing and healthy rangelands as resources to protect.
Bureau of Land Management Resource Management Plans (RMP)	BLM lands near the HLC NF are managed by the Butte, Missoula, and Lewistown field offices. The Butte and Lewistown plans were recently revised (2009 and 2020 respectively) while the existing plan for the Missoula area is under revision. These plan components are related to resilient terrestrial vegetation and livestock grazing and are complementary to the plan components for the HLC NF. Some HLC NF grazing allotments contain BLM lands and would also need to follow resource management plan direction for those parcels.
Bureau of Reclamation (BOR): Resource Management Plans, * Canyon Ferry RMP (2003) * Canyon Ferry Reservoir Shoreline RMP (2012)	These documents describe the measures the BOR will take toward the restoration and management of BOR lands surrounding the Canyon Ferry Reservoir. While these plans do not specifically address livestock grazing outside of limiting trespass, the direction within them is generally consistent with the plan components in the 2021 Land Management Plan for maintaining rangeland vegetation.
City of Helena: * Comprehensive Park Plan (2010) * Parks, Recreation, and Open Space Plan (2010)	The Parks, Recreation, and Open Space Plan (2010) includes goals and recommendations for open lands associated with the city which are immediately adjacent to NFS lands in the Divide GA. These measures complement the 2021 Land Management Plan components in the Divide GA, with goals of preventing the spread of noxious weeds and maintaining diverse, healthy rangelands adjacent to other land ownerships. No livestock grazing components are found in these plans.
County Growth Policies	These plans are integrated documents that focus on growth management and economic development strategies. All county growth policies recognize the importance of maintaining agricultural operations for local economies with some county plans recognizing the importance of Federal land leases for livestock grazing opportunities. Fergus County has conflicting language in their plan that does not align with 2021 Land Management Plan components stressing the need to balance livestock grazing opportunities with wildlife habitat needs.
County wildfire protection plans	The overall effect of the county plans would be to influence where treatments occur to contribute to desired vegetation conditions. Some county wildfire protection plans map and/or define the WUI. The HLC NF notes that these areas may be a focus for hazardous fuels reduction, and other plan components (such as NRLMD) have guidance specific to these areas. Managing for open forests and fire adapted species may be particularly emphasized in these areas. Most plans reference grazing and agriculture as values at risk.
Forest Service	The forest plans for NFS lands adjacent to the HLC NF include the Custer-Gallatin, Lolo, Flathead, and Beaverhead-Deerlodge NFs. Management of vegetation is consistent

<b>Resource plan</b>	<b>Description and Summary of effects</b>
Land Management Plans	across all NFs due to law, regulation, and policy. The cumulative effect would be that the management of vegetation and grazing would be complementary. This includes specific adjacent landscapes that cross Forest boundaries, such as the Upper Blackfoot, Divide, Elkhorns, Crazies, and the Rocky Mountain Range.
Montana State - DNRC: *Statewide Forest Resource Strategy (2010)	These plans guide resource management on state lands. They include many concepts that are complementary to plan components in the 2021 Land Management Plan. This plan has components for managing livestock grazing in forested habitats that are similar to the 2021 Land Management Plan.
DNRC Habitat Conservation Plan, (2010)	This document is a a multi-species habitat conservation plan to address the potential take of federally listed species on forested state trust lands managed by Montana state DNRC. This plan has components similar to the 2021 Land Management Plan for managing livestock grazing in habitats of concern.
DNRC Water Plan (2015)	The plan is a guide for water uses in the state of Montana. General concepts for agriculture are similar to 2021 Land Management Plan componenets.
Montana Fish, Wildlife, and Parks Conservation Management Plans *Big Horn Sheep (2010), Elk (2004), and Fish (2019) Management Plans	These conservation management plans provide specific direction for the management of big game and fish species for which they were developed. Goals and objectives of these FWP plans align with the plan components for livestock grazing that aim to improve wildlife habitat, upland and riparian vegetation nad prevent disease transmission. Plan components defer to FWP direction found in these plans for guidance.
Montana's State Wildlife Action Plan (2015)	This plan describes a variety of vegetation conditions related to habitat for specific wildlife species. This plan would likely result in the preservation of these habitats on state lands, specifically wildlife management areas. These plans also outline the sideboards on how domestic grazing leases on wildlife management areas will be managed. This plan would complement grazing management on HLC NFS lands.
Montana State Parks and Recreation Strategic Plan (2015-2020)	These plans guide the management of state parks, some of which lie nearby or adjacent to NFS lands. Terrestrial vegetation is a component of these parks, although not always the primary feature. Specific vegetation conditions would not necessarily contribute to the desired conditions as described for the HLC NF. Livestock grazing is not not an authorized use of state parks and therefore not addressed.
Montana Parks Strategic Plan (2020)	This strategic plan looks at Montana's state parks and recreation programs. It provides guidance, targets and solutions for overcoming the challenges facing the state's program. It also addresses a strategic framework to strengthen the park system in Montana. This plan does not address livestock grazing.
Montana Statewide Comprehensive Outdoor Recreation Plan - SCORP (2014-2018)	The SCORP is a Montana statewide comprehensive outdoor recreation plan that serves as a guiding document to promote integrated outdoor recreation management and service provision in a more holistic and effective manner. Many aspects of recreation management are studied and reported on including recreation challenges such as decreased funding and resources, increased maintenance costs, changes in recreation trends and preferences, and addressing aging and growing populations. This document does not address livestock grazing or rangelands.
Montana Army National Guard – Integrated Natural Resources Management Plan for the Limestone Hills Training Area (2014)	This plan is relevant to an area adjacent to NFS lands in the Elkhorns GA. The Limestone Hills area is primarily nonforested and calls for managing for fire-resilient vegetation as well as restoration of native vegetation including mountain mahogany specifically. This plan would be generally complementary to the HLC NF most especially in promoting the health of native vegetation.
National Park Service (NPS): Glacier National Park,	The general management plan for Glacier National Park calls for preserving natural vegetation, landscapes, and disturbance processes. Broadly, the terrestrial vegetation characteristics in this area are therefore likely similar to the wilderness areas in the

Resource plan	Description and Summary of effects
*General Management Plan (1999) *National Park Bear Mgmt. Plan (2010)	adjacent Rocky Mountain Range GA and would complement these conditions. These plans do not specifically address livestock grazing.
Natural Resources Conservation Service (NRCS), Strategic Plans *MT Soil Health Strategy (2015) * MT Sage Grouse Initiative Strategy (2016)	Both plans promote improved land management to promote soil biology and rangeland health for the benefit of native species while maintaining current land uses. These plans are consistent with the 2021 Land Management Plan as components of both promote management to increase soil health concets and improved livestock grazing. Both the sage grouse strategy and 2021 Land Management Plan promote wildlife-friendly fencing.

*Livestock grazing use*

Livestock grazing, especially for cattle, is likely to still be desired by the local livestock industry within the planning area for the foreseeable future. Cattle, sheep, and horses that graze the NFs during the summer months are provided forage from private lands during late fall, winter, and early spring. Forage from private lands during this period is in the form of native grass pasture, irrigated pasture, irrigated and dry land hay, and fall crop residue. The availability of private lands in the surrounding area that can provide summer forage is somewhat limited. This demand for grazed forage, especially during the months June through October, is greater than NFS lands can supply. Productive lands associated with the lands surrounding the planning area are generally used for crops, including spring/winter wheat and along with other cereal grains. Demand for grazing on NFS lands should continue to be very high for livestock operators whose private lands are adjacent to NF.

Large expanses of grasslands associated with nonarable lands near the planning area are generally obligated to cattle grazing. Some of these grasslands may produce forage at less than their full potential due to the abundance of exotic annual grasses and invasive weed species. Livestock production from State of Montana trust lands is expected to stay relatively stable in the planning area for the foreseeable future. Grazing on private lands depends on the market, drought conditions, and needs of livestock owners. Grazing on these nonfederal lands is expected to remain in high demand. Possible future reductions on Federal lands in the planning area due to reduced forage capacity (increases in invasive weeds and tree canopy closure) and tighter administrative constrains for protection and enhancement of TES habitat and other resource concerns will put added grazing pressure and demand on private and MTDNRC land leases.

Livestock grazing is influenced by effects that impact the allocation of forage resources between livestock and wildlife; predation and disease transmission; management adjustments to protect cultural and historical resources; fisheries; threatened and endangered species; water quality; considerations necessary due to wildfire and prescribed fire management, and recreation. All of these factors add to the complexity and expense for the ranching operations that are permitted to graze livestock on the Forest (Rimbey & Torell, 2011). Livestock management is generally considered more difficult on NFS lands than on private lands. In addition, the business of livestock management is subject to factors most often not under the control of livestock operators, such as tourism; land values and potential subdivision of ranches; labor prices and availability; domestic and foreign demand for livestock products; markets and meat prices; FS budgets and farm programs; fuel prices; predator control; social values; and federal policy.

*Increasing human population*

It is expected that recreational uses on NFS lands will continue to increase, and as more people nationwide continue to look for places to recreate. As more people venture onto public lands, differing societal desires and

ideas of what public lands should provide will continue to influence public land management policy. Increased attention and public recreation on grazing allotments in the future may make operating on NFS lands more expensive for permittees.

## Conclusions

The following key points summarize the conclusions for livestock grazing use, effects, and opportunities on the HLC NF.

### *Expected Rangeland Condition and Trend*

Rangeland condition and trend is expected to be maintained and improved under all alternatives, as each alternative has plan components or standards and guidelines to improve grazing management. This improvement should move riparian areas and upland plant communities towards desired conditions. Livestock management may become more intensive in a quicker timeframe under the action alternatives with the incorporation of new plan components, and therefore improve riparian areas more quickly than the no-action alternative.

### *Acres of suitable rangeland and number of permitted livestock head months or AUMs*

No alternative proposes to decrease suitable rangeland acreage or decrease head months/AUMs by formally closing allotments or portions of allotments for other resource allocations. Suitable acres and forage within the grazing allotments would continue to be available for livestock grazing.

- Invasive weeds will continue to be one of the biggest threats to desired rangeland condition under all alternatives. All alternatives have tools under the existing Weed EIS documents to effectively manage noxious weeds in a manner which should preserve forage production and permitted grazing use within allotments. Action alternatives include plan components that are more proactive in adapting to new findings and technology in weed management and should have a greater impact in slowing the spread of invasive species, which benefits herbaceous vegetation and ultimately livestock grazing in the future.
- Under all alternatives the permitted use of the existing grazing allotments would continue. Based on current rangeland and riparian conditions and the need to revise allotment management plans for many allotments, changes in the number of permitted HMs are difficult to predict. Project-level analysis will determine future stocking rates and other management adjustments to meet desired conditions under all alternatives. Permitted head months over the long-term could possibly decrease under all alternatives due to more intensive management of RMZs and aquatic TES habitat.
- Motorized access on allotments could become more restricted under alternatives that contain RWAs. Some allotments may be more difficult to administer if a travel variance to use motor vehicles is not authorized. However, most of the RWAs are already semiprimitive and/or roadless under current management and contain very small amounts of suitable rangeland and range infrastructure. Therefore, allocation of RWAs should not affect livestock grazing within the planning area.
- All alternatives provide opportunity to implement vegetation treatments, such as timber harvest, prescribed fire, and to allow wildfire to provide resource benefits where feasible. Vegetation should move towards a desired mix of conditions from these treatments and thus provide a secondary benefit of improving forage conditions and transitory range in the future.

## 3.28 Timber and Other Forest Products

### *3.28.1 Introduction*

The HLC NF contains timber resources in demand by the American public such as lumber, house logs, pulpwood, and fuelwood. Timber harvest may be conducted to supply timber products as well as move vegetation towards desired conditions and meet other resource objectives (e.g. improving watershed condition,



improving wildlife habitat, and reducing wildfire risk). Timber harvest also provides jobs and income in logging and manufacturing of wood products. Other forest products include plant and fungi materials that are gathered from NFS lands; the most common of these provided by the HLC NF are Christmas trees, posts and poles and mushrooms.

Timber and other forest products are analyzed at the scale of all NFS lands across the planning area. Timber demand is evaluated across the counties associated with the HLC NF. Key indicators that will be used to measure effects of alternatives are:

- Timber and Harvest Suitability (acres)
- Lands suitable for timber production
- Lands unsuitable for timber production where harvest may occur for other multiple use values
- Timber supply (million board feet, mmbf, and million cubic feet, mmcf)
- projected timber sale quantity (PTSQ)
- projected wood sale quantity (PWSQ)
- sustained yield limit (SYL)
- Timber demand (qualitative)
- Timber harvest and associated activities (acres)
- Desired condition departure score (penalty points)
- Other forest products (qualitative)

Timber harvest and timber production were raised as issues during public scoping, including desires to increase the amount of harvest, lands suitable for timber production, and/or the volume outputs over time; as well as concerns for the impacts of harvest on other resources and a desire to limit this use.

### Definitions and metrics

The metrics for estimated timber volume outputs have changed from the 1982 Planning Rule (which guided the 1986 plans); and those defined in the 2012 Planning Rule. The metrics defined for the 1986 Forest Plans are disclosed for alternative A. However, to provide a direct comparison, alternative A was also included in the modeling to calculate the metrics as defined in the 2012 Planning Rule. The timber volume metrics from both planning rules and/or associated directives are defined as follows:

- *Long term sustained yield capacity* (LTSYC, alternative A) is the highest uniform wood yield from lands being managed for timber production that may be sustained under a specified management intensity consistent with multiple-use objectives (47 CFR, 219.3 1982).
- *Allowable sale quantity* (ASQ, alternative A) is the quantity of timber that may be sold from the area of suitable land covered by the forest plan for a time period specified by the plan. This quantity is usually expressed on an annual basis as the “average annual allowable sale quantity.” (47 CFR, 219.3 1982)
- *Sustained yield limit* (SYL) is the amount of timber, meeting applicable utilization standards, which can be removed from a forest annually in perpetuity on a sustained-yield basis. It is the volume that could be produced in perpetuity on lands that *may be suitable* for timber production. Calculation of the limit includes volume from lands that may be deemed not suitable for timber production after further analysis during the planning process. The calculation of the SYL is not limited by land management plan desired condition, other plan components, or the planning unit’s fiscal capability and organizational capacity. The SYL is not a target but is a limitation on harvest, except when the plan allows for a departure (U.S. Department of Agriculture, Forest Service, 2015b).
- *Projected wood sale quantity* (PWSQ) is the estimated quantity of timber and all other wood products that is expected to be sold from the planning area for the plan period. The PWSQ consists of the PTSQ (below) as well as other woody material such as fuelwood, firewood, or biomass. The PWSQ includes

volume from timber harvest for any purpose based on expected harvests that would be consistent with the plan components. It is also based on the planning unit's fiscal capability and organizational capacity. It is not a target nor a limitation on harvest. (U.S. Department of Agriculture, Forest Service, 2015b)

- *Projected timber sale quantity* (PTSQ) is the estimated quantity of timber meeting applicable utilization standards that is expected to be sold during the plan period. As a subset of the projected wood sale quantity, the PTSQ includes volume from timber harvest for any purpose from all lands in the planning area based on expected harvests that would be consistent with the plan components. The PTSQ is also based on the planning unit's fiscal capability and organizational capacity. PTSQ is not a target nor a limitation on harvest. (U.S. Department of Agriculture, Forest Service, 2015b)

The LTSYC and SYL are roughly analogous; and ASQ and PWSQ are analogous; but in both cases these measures differ because the lands that are included in the calculation are not the same.

*Timber production* is the purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use (36 CFR 219.19). The identification of lands suitable for timber production is a key element of the forest plan (refer to appendix H for details on this process). The lands suitable for timber production under alternative A were updated to account for regulation and policy that have changed the management situation since 1986, such as the designation of IRAs. This ensures that the depiction of alternative A reflects what the management situation would be if this alternative were selected and allows for a direct comparison to the suitability determinations made for the action alternatives.

*Timber harvest* the removal of trees for wood fiber use and other multiple-use purposes (36 CFR 219.19). Harvest of timber on NFS lands occurs for many reasons and may be allowed on lands unsuitable for timber production, unless prohibited by other land designations and plan components.

## Changes between draft and final

Multiple changes were made for the final EIS; all changes are within the scope of the DEIS analysis, and address issues that the public has had an opportunity to comment on. This section details the key changes between the draft and final analysis for timber. See the terrestrial vegetation section also, as the modeling changes between these resources are interconnected.

First, an analysis of preferred alternative F is added. This alternative is similar to alternative B with respect to lands suitable for timber production, with the addition of several areas from alternative E. The modeling emphasis for this alternative includes a blend of timber production and movement towards desired conditions. In addition, information in the affected environment section has been updated to include data up to 2018. In response to public comments, several appendices have been added. Appendix H addresses the methodologies and results of timber and vegetation modeling in detail, including the determination of lands suitable for timber production and PRISM model formulation; and appendix I details the NRV analysis.

The mapping of lands suitable for timber production was updated based on a new RMZ map and other technical corrections. The lands suitable for timber production were decreased based on excluding RMZs. In addition, an error in the mapping of lands where harvest can occur for alternative A was rectified; in the DEIS, this calculation incorrectly omitted IRAs and nonforested areas.

Based on the updates to the suitability mapping, other model improvements, and public comments, the timber modeling was redone. Key modeling improvements include:

- The PRISM model replaced SPECTRUM. PRISM is similar and includes the same functionality.
- The modeling map was updated to: 1) correctly classify the cold and cool moist potential vegetation types (PVTs); 2) update vegetation type and structure to reflect disturbances and treatments up to 2018; and 3) adjust size, density, and vertical structure to be more similar to plot data.

- Model assumptions were updated and refined, including:
  - The desired condition goals were updated, based on new NRV modeling.
  - Future disturbances were updated based on new SIMPPLLE modeling.
  - Disturbance acres were proportioned across the landscape based on the historical proportion on lands that are suitable versus unsuitable for timber production.
  - Corrections were made to “natural attrition” assumptions in lodgepole pine.
  - Clarified stand prescriptions for lodgepole pine vegetation types in the cold PVT.
  - The required ratio of clearcut to shelterwood prescriptions was relaxed.
  - SYL for each proclaimed Forest was added as a top constraint to PTSQ volume.
  - A nondeclining even flow criteria was applied to the HLC NF to model alternatives.
  - RMZs were constrained to a low harvest level. Alternative A was calibrated to consider RMZs in a fashion similar to the action alternatives.
  - Precommercial thinning activities were eliminated in lynx habitat.
  - Updates to cost accounting were done to account for treatments that occur on the Beaverhead-Deerlodge portion of the planning area.
  - The updated lynx potential habitat layer for the HLC NF was incorporated.

Based on the modeling updates, the projected sustained yield limit, timber volume, harvest acres, and prescribed burning acres were updated for all alternatives.

- The sustained yield limit is estimated to be higher than what was estimated in the DEIS (10.7 mmcf/58 mmbf as compared to 9.07 mmcf/48 mmbf). This is within the range of effects analyzed in the DEIS, because it is within the upper limit of a DEIS scenario of Alternative E unconstrained by budget.
- The projected timber sale and wood sale quantities are slightly different than what was disclosed in the DEIS, generally lower. This is due to the increased amount of fire projected on the landscape. The new volume levels are within the ranges of the alternatives in the DEIS and do not materially change the effects disclosed in the DEIS. They do not exceed the sustained yield limit under any alternative or budget scenario.
- The levels of timber harvest and prescription type changed due to these modeling improvements, with less regeneration harvests expected in most alternatives. However, the levels of harvest are within the ranges of effects disclosed in the DEIS.
- The levels of prescribed burning under a constrained budget are lower than what was predicted in the DEIS; however, with an unconstrained budget the amounts of burning are more similar to the DEIS. These various scenarios are within the objective for fire and fuel treatments (FW-FIRE-OBJ-01) and within range of effects considered in the DEIS.

Several plan components were reworded to improve clarity; none of these changes alter the context and intent of those components. In addition, based on an updated NRV analysis and public comments, updates were made to FW-TIM-STD-08 (maximum size openings for even-aged regeneration harvest treatments). The new patch size is smaller (75 acres) and applies to all PVTs. Two new suitability plan components were added to clearly identify the lands that are suitable and not suitable for timber production (FW-TIM-SUIT-01 and 02).

A process error was discovered for the mapping of lands unsuitable for timber production where harvest can occur for other purposes for alternative A. This process had eliminated some lands where harvest can occur, including IRAs and non-or low-forested lands. This alternative was therefore not comparing equally against the action alternatives. The process was corrected to accurately depict all lands where harvest could occur for alternative A. This error did not affect the timber modeling or any associated outputs, because the layer was not used in constructing the layers used by PRISM.

Finally, additional analysis is added for the following topics in response to public comments:

- Projected volumes and harvest without a budget constraint, and associated effects.

- Clarification of the calculation of timber metrics.
- Timber volume outputs in comparison to total timber growth and mortality.
- Timber suitability and modeled outputs in lynx and grizzly bear habitat, and how those areas were considered in the timber modeling.
- Timber suitability in municipal watersheds and conservation watersheds, and how those areas were considered in the timber modeling.
- Harvest and volume outputs from lands suitable versus unsuitable for timber production.
- How plan components related to fire suppression, wildlife habitat, recreation opportunity settings, and other resources were incorporated into the timber modeling and expected outputs.
- How salvage and sanitation harvest are considered in the timber analysis.
- Potential risks of regeneration failures, and other climate change considerations related to future timber production and economic contributions.

### *Changes as a Result of Objections*

As a result of the objection resolution process, several additional changes (alternatives C, D, and F) were made to the FEIS. These changes focused primarily on modifications to the Nevada Mountain RWA, as described in Part 1 of the FEIS. These changes resulted in subsequent updates to ROS and SIO classifications as well as lands suitable for timber production and lands unsuitable for timber production where harvest can occur for other purposes. These updates are reflected in the 2021 Land Management Plan. The changes overall affected less than several hundred acres.

The timber analysis and summaries displayed in the FEIS and in appendix H have not been updated to reflect these changes. This is because the updated layers were interwoven throughout the timber modeling process, which is too complex to be re-done in a reasonable or timely fashion. Other more straightforward analyses that summarized combinations of these layers with relevant timber factors were also not redone, to ensure that the analysis compares the equivalent numbers throughout. The alteration of several hundred acres is too small to affect measurable change in the modeling process, or to alter the relative comparisons and conclusions reached throughout the analysis.

### **3.28.2 Regulatory framework**

36 CFR 223. 1 allows that trees, portions of trees, and other forest products on NFS lands may be sold for the purpose of achieving the policies set forth in the Multiple Use Sustained Yield Act as amended and the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended.

36 CFR 223.239 and 240 provide regulations for free-use without a permit for members of Tribes with treaty or other reserved rights related to special forest products.

36 CFR 261 .6 lists activities regarding timber and other products that are prohibited.

### **3.28.3 Assumptions**

Much of the timber analysis is based on harvest schedule modeling conducted with the PRISM model; the assumptions associated with modeling are detailed in appendix H. Harvest prescriptions are generalized for this broad scale analysis. During implementation of the forest plan under any alternative, site specific prescriptions would be tailored to each forest stand. Site specific mitigations and best management practices would also apply. These site-specific factors would not materially change the broad scale volume estimates made for planning purposes.

### 3.28.4 Best available scientific information used

The affected environment was described using FS cut and sold reports from the Timber Sale Accountability database and treatment records in the Forest Activity Tracking System database. Vegetation plot data and a variety of geospatial data such as soil and vegetation mapping were used to determine the lands that may be suitable for timber production (see appendix H). Yield tables were developed using the Forest Vegetation Simulator. This information along with PRISM modeling was used to estimate acres treated by treatment type and volume outputs, as described in appendix H. There is no incomplete or unavailable information for the timber analysis.

This analysis was completed at the strategic level, using forest level data sources. Due to the scale of the mapping sources used to determine suitability, site-specific field review may result in changes at the project level. In addition, design criteria applied to projects, such as specific tree retention requirements to meet other plan components, cannot be modeled programmatically. However, these site-specific adjustments are not expected to differ greatly from the prescriptions used to develop the yield tables for modeling, and therefore not expected to materially change the volume estimates at the forestwide scale.

The data used is the latest available information. The effects of recent disturbances, including the fires of 2018, have been incorporated into the modeling input files.

### 3.28.5 Affected environment

The use of natural resources on the HLC NF and surrounding lands played an essential role in the economy and growth of the area since the early settlement by European-origin Americans. Mining for gold and other minerals boomed in the late 1800's, and tree cutting that occurred for fuelwood, mine timbers, and railways was extensive in accessible drainages. Harvest became associated with a demand for pulpwood during World War II and to support numerous small mills (U.S. Department of Agriculture, Forest Service, 1986; U.S. Department of Agriculture, Forest Service, Lewis and Clark National Forest, 1986). The original mission of the FS focused on protecting water and timber (Kline & Mazzotta, 2012), and harvest continues to be an important use. Timber harvested on the HLC NF provides a variety of wood products, such as sawlogs, veneer logs, and house logs, as well as logs used for pulpwood, posts and poles, firewood, furniture, and energy.

#### Timber and Harvest suitability

Lands suitable for timber production were used to derive the allowable sale quantity in the 1986 Forest Plans. These plans determined 282,307 acres to be suitable for timber production on the Lewis and Clark NF and 251,600 acres to be suitable on the Helena NF (U.S. Department of Agriculture, Forest Service, 1986; U.S. Department of Agriculture, Forest Service, Lewis and Clark National Forest, 1986). Timber suitability was determined through the use of resource data and computer models and followed the handbook and planning regulations that were in place at the time.

There have been changes to timber suitability as the forest plans have been implemented. These changes include de-facto reductions caused by the designation of IRAs. There have also been changes in available vegetation data and land ownership status. To accurately portray the existing condition (and alternative A), timber suitability was recalculated to reflect these changes (Table 257). Roughly 119,000 fewer acres are suitable for timber production than what was identified in the original 1986 Forest Plans.

**Table 257. Lands suitable for timber production, existing condition (no-action alternative)**

Suitability category	1986 Plan LCNF	1986 Plan HNF	No-action alternative (1986 Plan as amended) for HLC NF
Total NFS lands	1,843,397	975,100	2,883,227
Withdrawn Lands <sup>1</sup>	- 393,532	-102,600	- 1,958,714
Non-Forest Land <sup>2</sup>	- 486,860	-106,600	- 169,271

Suitability category	1986 Plan LCNF	1986 Plan HNF	No-action alternative (1986 Plan as amended) for HLC NF
Irreversible Resource Damage is Likely or Adequate Restocking Not Assured <sup>3</sup>	- 283,088	- 211,900	- 88,113
Lands Tentatively Suitable for Timber Production	679,917	554,030	667,129 (23% of NFS lands)
Lands where management guidance precludes timber production, where management requirements cannot be met, or not cost efficient in meeting timber production objectives	- 397,610	- 302,400	-252,193
Lands Suitable for Timber Production	282,307	251,600	<b>414,936 (14% of NFS lands)</b>

1 Change in the amount of withdrawn lands is due to the addition of IRAs; and the addition of wilderness areas designated by Congress in the Rocky Mountain Range Geographic Area.

2 Total forested lands have decreased because withdrawn lands changed substantially. In addition, vegetation data is more refined and more accurately maps forested areas.

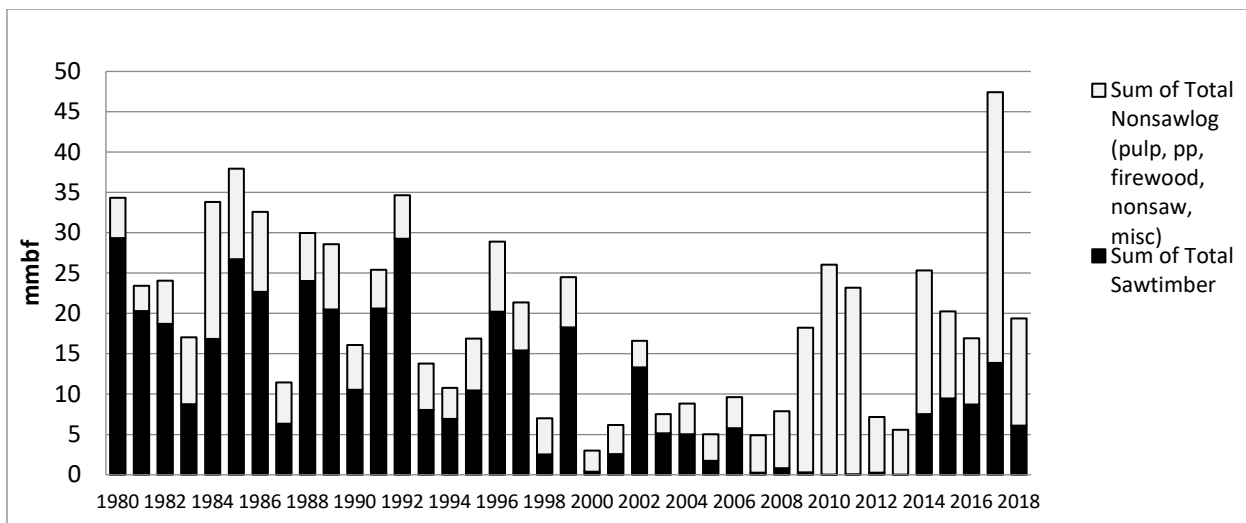
3 The difference between irreversible damage and adequate restocking is due to new data and map products.

Harvest may occur on an additional 50% of NFS lands that are not suitable for timber production but where harvest may occur for other multiple use values, as shown in Figure 35 and Figure 37 (in the effects that vary by alternative, timber and harvest suitability section). The lands where harvest may occur are shown with and without IRAs. While harvest could occur in those areas, it would be constrained by the 2001 Roadless Area Conservation Rule.

### Timber supply

Forest growth rate is one indicator of site productivity. Site productivity is considered to be fixed based on attributes such as topography, soil type, and climate. On the HLC NF, tree growth is estimated to be 20 to 84 cubic feet per acre per year on suitable lands with average rotation ages ranging from 95 to 150, depending on the species and site (U.S. Department of Agriculture, Forest Service, 1986; U.S. Department of Agriculture, Forest Service, Lewis and Clark National Forest, 1986). Forest Inventory and Analysis (FIA) reports describe forest growth and mortality (Wilson, 2001). On the Lewis and Clark NF, net annual growth was 50.6 million cubic feet (mmcf) which incorporates 15% mortality. On the Helena NF, the net annual growth was 20.2 mmcf based on 31% mortality. The total net annual growth across the HLC NF was 70.8 mmcf. These reports were based on a total of 2,837,693 acres, resulting in an average of 25 cf/acre/year. This is similar to estimates generated from the timber model (23 cf/ac/year across forested areas and 21 cf/ac/year on lands suitable for timber production).

Figure 28 displays the volume of timber cut and sold on the HLC NF from 1986 to 2018. The amount is split by sawtimber and all other timber products (nonsaw, firewood, posts and poles). The largest sawtimber volume harvested were in 1980 and 1992 (nearly 30 mmbf). Sawtimber sold dropped in the 2000's. Much of the timber cut since 2009 has been mountain pine beetle-killed lodgepole pine which was sold as nonsaw material. Firewood has been a consistent contributor to volume and has been particularly abundant in the last decade due to the availability of dead trees. The last several years (2014-2018) have seen an increase in sawtimber sold, as well as a spike in nonsaw material in 2017.

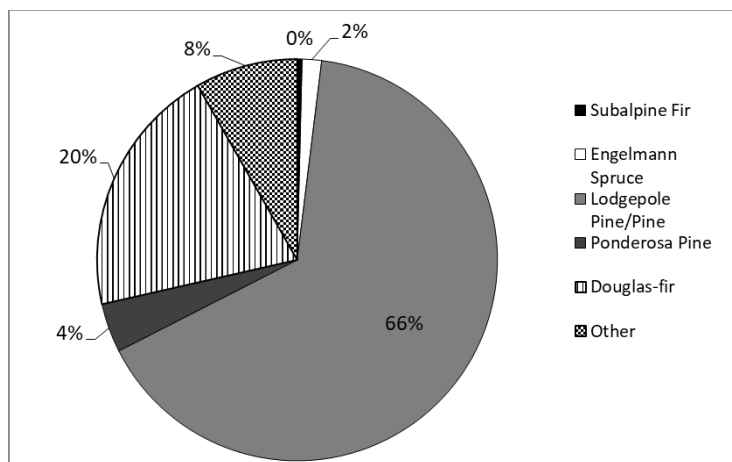


**Figure 28. Timber product volume sold from the HLC NF 1980-2018**

The long-term sustained yield capacity (average annual output) in the 1986 Forest Plans was 21.3 mmbf for the Helena NF and 20.5 mmbf for the Lewis and Clark NF. The allowable sale quantity (ASQ) is 15 mmbf on the Helena NF and 12 mmbf on the Lewis and Clark NF, for a total of 27 mmbf. The average annual timber volume of all timber products offered by both forests combined is as follows. In no decade has the actual amount sold approached the maximum allowable sale quantity.

- 1980-1989: 20.8 mmbf
- 1990-1999: 16.1 mmbf
- 2000-2009: 5.1 mmbf
- 2010-2018: 14.6 mmbf

Figure 29 shows sawtimber volume sold by tree species. The primary sawtimber species is lodgepole pine, one of the most common species that dominates many productive and accessible landscapes. It has been favored as a timber species due to the ease with which it regenerates. Douglas-fir is the second most prevalent sawtimber species. The species represented by the “other” category include categories such as general softwoods and add volume where the species is not tracked.



**Figure 29. Sawtimber sold (mmbf) 1980-2018 by species on the HLC NF**

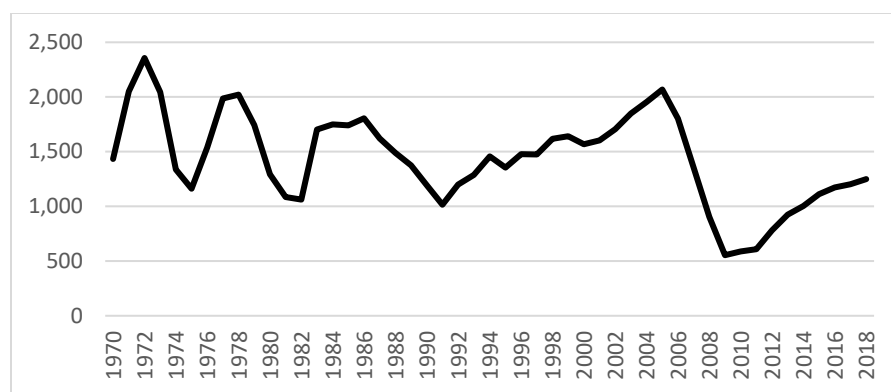
Factors such as site productivity, climate, disturbances, and human activities influence timber availability. Stand replacing fires were common on the HLC NF during the warm climate period in the late 1800’s. These fires along with early forest practices were followed by a moist climate suitable for tree establishment. Forest cover established quickly in the early 1900’s in burned or cut-over areas. The moist conditions that prevailed during most of the next century limited the potential for wildfires and insect outbreaks. These factors along with forest management policies contributed to decades of fire suppression. Thus, relatively extensive continuous forests of the same age and density developed.

These forests were susceptible to drought stress when the climate shifted into a warm/dry phase in the 1980’s. The buildup of fuels that resulted in some areas along with the dry climate resulted in more large wildfires. From 1980 to 2013 approximately about 20% of the HLC NF burned in wildfire. Of this, about 55,400 acres burned in areas deemed suitable for timber production in the 1986 Forest Plans. Where stand-replacing fires occurred, forests were returned to an early successional stage of development, and it will be at least 50-60 years before the trees reach a commercial size. Homogeneous forests also helped fuel a recent mountain pine beetle outbreak. At the peak of the outbreak in 2009, over 900,000 acres across the HLC NF were infested, over 400,000 of which were on the suitable timber base as defined in the 1986 Forest Plans. Mortality was most extensive in mature lodgepole pine. In areas where the sawtimber component was substantially impacted, the availability of lodgepole timber will be reduced for the next few decades until new forests grow to a merchantable size.

**Timber demand**

The availability of timber is important to local economies on the HLC NF. The presence of a timber industry infrastructure allows for timber harvest to occur to meet multiple resource management objectives and provides jobs and other economic inputs to local communities.

Ultimately, the U.S. market demand for lumber is a derivative for the demand for construction of residential and commercial structures. As a derived demand, lumber markets tend to reflect shifts in national housing construction rates. Across subsectors, residential construction in particular is the single largest consumer of lumber nationwide. Housing starts are measured by the U.S. Census Bureau. Historical annual U.S. housing starts are shown in Figure 30. The losses and eventual recovery following the great recession are evident. Since 2008, starts have rebounded, but to a steadier state, rising and flattening out above 1 million annually (U.S. Census Bureau). Demand for new and remodeled housing can and will change over the planning decades, but for the present, markets which consume U.S. lumber are considered relatively healthy with room for growth.



**Figure 30. U.S. Housing Starts in Thousands**

Source: U.S. Census Bureau.

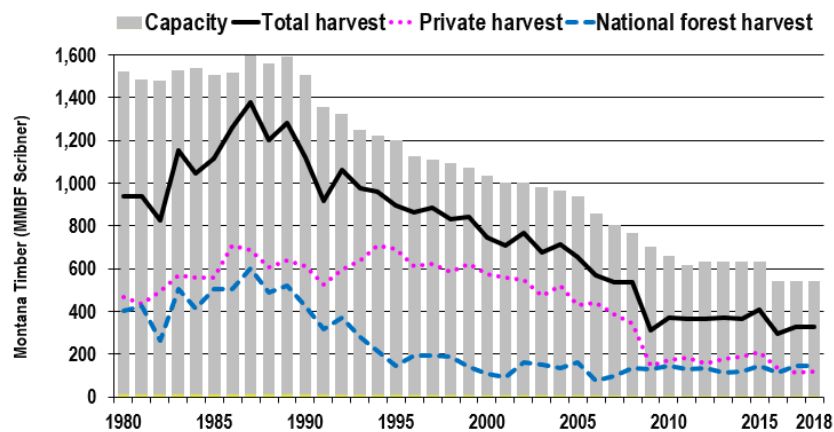
Regionally, demand for sawlogs remains stable, but Montana Forest Industries experienced less rebounding and more flattening out post-recession. Employment regained 700 jobs since a low in 2010, with an estimated



7,732 jobs statewide in 2017, but compared to 2005, industry employment remains down a few thousand from an estimated 10,006 jobs in 2005. Similarly, in 2004 primary sales were over \$1.5 billion, and more recently Montana Forest Industry gross sales have leveled out below \$600 million; (\$569 million in 2017). This evident downshift in Montana Forest Industries largely reflects permanent closures and loss of invested capital and infrastructure including the state's only pulp mill in 2010 (T. Morgan, 2019).

Today there remain approximately 80 primary forest product firms operating in Montana. Most of them are small and nearly all are directly dependent on timber from public lands. A much higher proportion of remaining mills exist in Western Montana where the resource is still most economical.

Collectively, these 80 firms have a vastly shrunken capacity from Montana's historic industry levels. Montana's total timber capacity and harvest levels have consistently trended down since 1990. This decline can be observed in Figure 31. Capacity to harvest ratio is relatively high, which has improved competitiveness of sawlog prices and helped ensure successful timber sales across Montana. Higher ratios also suggest the industry is capable of scaling up production in the short term to meet increased national lumber demand, as long as sufficient timber supply is available. Though it is beyond this report to forecast construction and lumber demand, empirical data indicates that sawlog prices may remain relatively steady or increase in Montana, save for another housing recession or similar market shock.



**Figure 31. Montana Timber Capacity and Harvest 1980-2018 (T. Morgan, 2019)**

Timber production remains important to the economy of the multi-county planning area for the HLC NF, as shown in the timber report from the Economic Profile System (Headwaters Economics, 2019) and detailed here. In 2016, the amount of timber-related employment in the primary planning area was 0.8% of private employment overall, just under the statewide percentage of 0.9 percent. However, relatively large percentages were present in the western area (Broadwater, Jefferson, Lewis and Clark, and Powell Counties), at 1.7 percent or 508 jobs from timber-related industries. This is nearly twice the percentage in Montana, and over 2.5 times the national percentage of timber-related employment (0.6 percent). Furthermore, timber-related employment was quite high in Broadwater County and Powell County. The 155 timber-related jobs in Broadwater County in 2016 occurred primarily in sawmills. In Powell County, growing and harvesting timber was a greater proportion of the total, accounting for 105 of the 262 timber-related jobs.

### Timber harvest and associated activities

Timber harvest is a tool to provide timber products and achieve multiple resource values, including but not limited to wildlife habitat, tree growth and timber productivity, lowering fuels and fire risk, and enhancing forest resilience to disturbances. Three main types of harvest are used: even-aged regeneration harvest

(clearcutting, shelterwood, and seed-tree cuts); uneven-aged regeneration harvest (group selection and single-tree selection); and intermediate harvest (commercial thins and improvement cutting).

Table 258 shows acres harvested from 1940 to 2017, roughly 138,649 acres total. The majority (91%) occurred on lands suitable for timber production. The greatest amount of harvest occurred in the 1960’s and 1990’s. Regeneration harvests were the most common, representing over 75% of harvest prior to 1990. This is because the primary timber species on suitable lands, lodgepole pine, has a stand-replacing regeneration strategy. There has been a shift to more intermediate harvests in recent decades. Regeneration harvests since 2000 have been largely related to post-fire and insect projects.

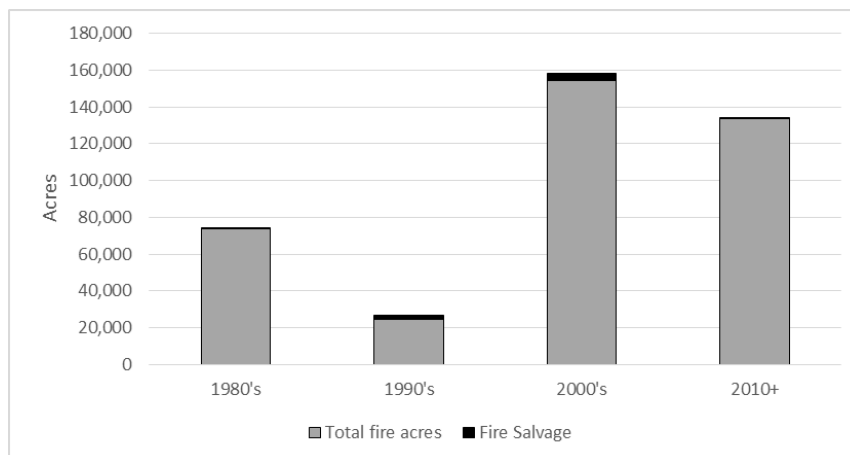
**Table 258. Harvest by type and decade for the HLC NF, 1940-2017**

Decade	Even-aged regeneration harvest		Other harvest		All harvest types	
	Total acres	Average annual	Total acres	Average annual	Total acres	Average annual
1940-1959	7,641	764	639	64	8,270	827
1960-1969	33,367	3,337	3,416	342	36,783	3,678
1970-1979	21,434	2,143	2,785	279	24,219	2,422
1980-1989	18,392	1,839	5,133	513	23,525	2,353
1990-1999	20,385	2,039	10,390	1,039	30,775	3,078
2000-2009	7,566	757	3,114	311	10,680	1,068
2010-2017	3,698	462 <sup>1</sup>	5,866	733	9,564	1,196

<sup>1</sup> The average is based on 8 years

**Salvage and sanitation**

Salvage harvest after wildfires, and sanitation of insect-infested or diseased trees, is included in the harvest and volume summaries above. However, these volumes are not part of estimated future timber outputs in the environmental consequences section, per planning direction (U.S.C. 1611(b); FSH 1909.12, 64.3). In the past, salvage occurred on a small proportion of burned acres on the HLC NF (Figure 32). Since 1986, salvage has occurred on about 2% of the acres burned and was focused in lands suitable for timber production. This practice has been more common on the west half of the HLC NF (Helena NF), due to the location of fire events. Most of the wildfire since 1986 on the Lewis and Clark NF occurred in wilderness where salvage is not permitted.



**Figure 32. Fire salvage acres compared to total wildfire area burned by decade 1986-2017**

**Reforestation**

Other activities associated with the tending of harvested stands occur on the HLC NF, including reforestation. Precommercial thinning and other timber stand improvement activities may also occur to manage stand composition or density.

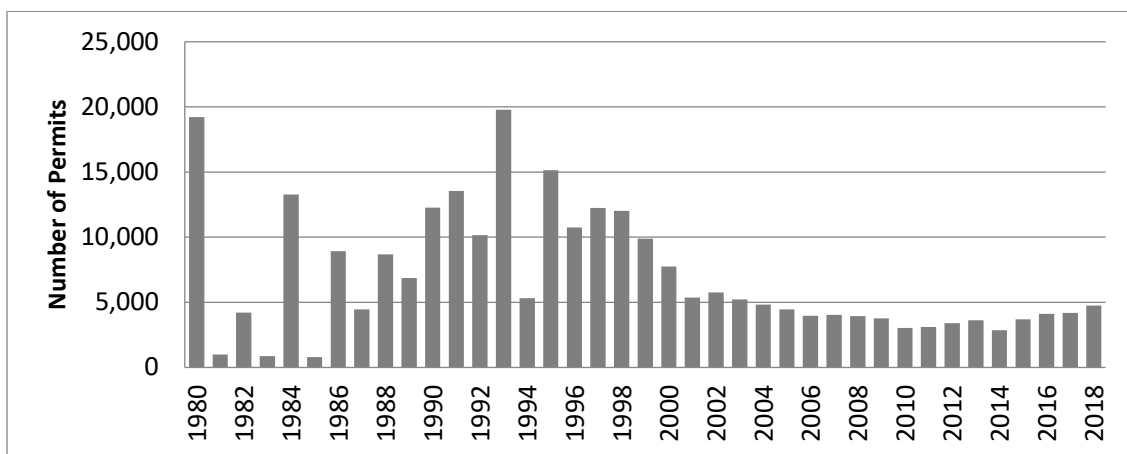
By law, stands treated with regeneration harvest are reforested either naturally from seed onsite or artificially (tree planting). After natural disturbances, most often reforestation occurs naturally but in some cases planting is done particularly on lands suitable for timber production, because these lands should be maintained in an appropriately stocked condition per the NFMA. Reforestation success is closely monitored. From 1976 to 2018, 88% of reforested stands on the HLC NF were progressing or certified as satisfactorily stocked within 5 years, and 98% are currently progressing or certified. The 10% difference in these figures represents stands that took longer than the 5-year timeframe to reforest. Only 2% are not progressing or certified. Reforestation failures can occur for many reasons, including hot/dry weather, poor seedling stock, poor planting techniques, failure to assess site suitability, or disturbances that happen after germination. Some of these areas may be planned for reforestation remedies (replanting) that have not yet occurred.

**Prescribed burning**

Prescribed burning has typically been conducted after timber harvest to reduce fuel loadings and/or prepare the site for regeneration. In recent decades, it has increasingly been used as a stand-alone ecosystem treatment for purposes such as reducing hazardous fuels, favoring fire-resistant intolerant species and large trees, reducing stand density, and/or promoting early seral forests. The Forest currently conducts prescribed burning on an average of 13,000 acres per year, including both forested and nonforested vegetation types.

**Other Forest Products**

Special forest and botanical products include, but are not limited to, mosses, mushrooms and other fungi, roots, bulbs, berries, seeds, wildflowers, forbs, sedges, grasses, nuts, ferns, boughs, bark, cones, burls, transplants, and Christmas trees. Other than personal use Christmas tree permits, the HLC NF offers little in the way of commercial or personal use permits for special forest products due to the limited demand relative to the resources needed to administer the permits. Records are kept of the permits issued for Christmas trees (Figure 33). The supply of special forest products is dependent on ecological conditions and distribution of growing sites. Forest management or natural disturbances can influence the supply of certain products. For example, fire can increase availability of mushrooms, and thinning of young sapling stands and conifer regeneration can increase production of Christmas trees for a period of time.



**Figure 33. Number of Christmas trees sold from the HLC NF, 1986-2018**

Special forest and botanical products have importance to the Tribes as traditional and cultural uses. As per current handbook direction (2409.18, section 87.13), the Forest considers “treaty rights, customary and traditional uses (including subsistence and other historical uses of plant material by Tribes), the federal trust responsibility to Tribes, and competitive market demands in determining which products would be excluded from or allowed for sale to commercial harvesters. When there is a shortage of any particular special forest product for tribal use, commercial permits would be issued only to the extent that the tribal use can be accommodated.”

### Benefits to people

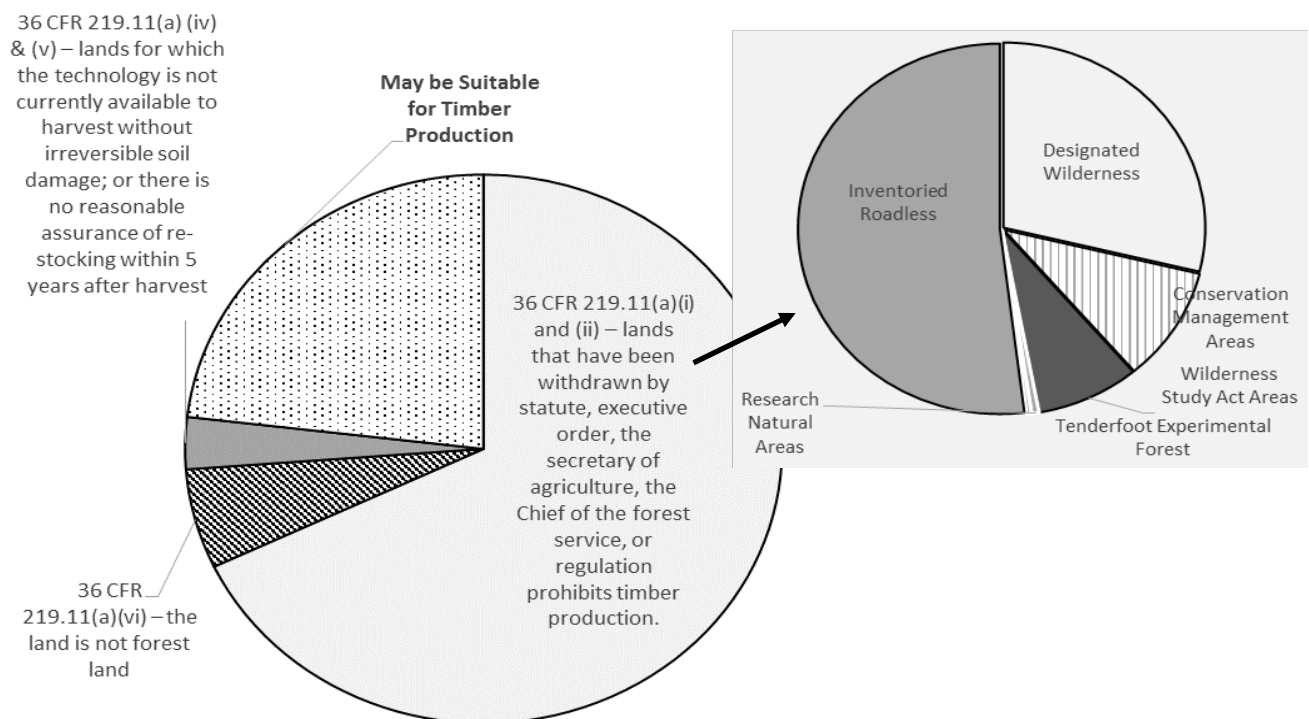
Timber products and other forest products are identified as multiple uses and key ecosystem services provided by the HLC NF. The economy of local communities can directly benefit from the use of these products. Please refer to the social and economics specialist report for more information about multiple uses, key ecosystem services, and benefits to people.

### 3.28.6 Environmental consequences

#### Effects common to all alternatives

##### *Timber and Harvest Suitability*

Lands suitable for timber production were determined following the 2012 Planning Rule (U.S. Department of Agriculture, Forest Service, 2019) and associated directives (U.S. Department of Agriculture, Forest Service, 2015b) as described in appendix H. Lands that *may be suitable* for timber production are the same for all alternatives and total 667,129 acres. These lands are physically and biologically capable of timber production and have not been administratively withdrawn. Figure 34 shows the proportions of the HLC NF that was excluded from lands that may be suited, based on the factors prescribed in CFR 219.11.



**Figure 34. Determination of lands that may be suitable for timber production on the HLC NF**

Based on management direction and desired conditions, lands determined to be suitable for timber production vary by alternative and are a subset of the lands that *may be* suitable for timber production. The determination of these lands is discussed in the *Effects that vary by alternative* section.

In all alternatives, unless prohibited, timber harvest is allowed on lands not suitable for timber production for other multiple use purposes, when consistent with management direction for the area. An example of such lands are those that contain productive forests but where timber production would not be a primary or secondary objective of management, based on the plan components for those areas. This would include areas where the management emphasis is on other resources values such as wildlife or recreation. Another example would be lands that contain dry forests that do not meet the productivity requirements to be considered forest lands, but harvest of trees could be done for objectives such as hazardous fuels reduction. Timber harvest on these lands is not scheduled or managed on a rotation basis but does contribute towards projected sale quantities.

### ***Timber Supply***

Under all alternatives, the availability of timber and other forest products would fluctuate based on disturbances. The actual amount of timber offered would be influenced by a variety of factors, including site-specific environmental analyses, public involvement, and administrative appeals and litigation (T. A. Morgan & Baldrige, 2015). Site-specific project analyses would consider factors that are not well-represented by modeling, such as design criteria to meet specific resource objectives. These would influence project design but are not expected to materially change the timber yield estimates generated by the modeling presented in this analysis. Timber volume offered is also influenced by factors outside the authority of the FS. For example, the United States Fish and Wildlife Service may provide direction that limits harvest levels to protect threatened and endangered species. Further, conditions and activities on adjacent lands can limit harvest, because the impacts of harvest on other ownerships is taken cumulatively into account when assessing the environmental impacts of projects on NFS lands.

### ***Timber Harvest and associated activities***

Under all alternatives, timber harvest is an allowable activity on the HLC NF. The amount of harvest that occurs would be limited by the budget and workforce capacity. The influence of reasonably foreseeable budget limitations was incorporated into the timber volume modeling.

### **Salvage and sanitation**

There is the potential for salvage or sanitation harvest to occur under all alternatives. For the purposes of this discussion, salvage includes any post-fire logging activity (including regeneration or intermediate silvicultural systems). The extent of these activities would depend on the timing and location of disturbances, the condition of vegetation and other resources in relation to desired conditions, the risks associated with wildfire potential or insect spread, public safety, high value resources, and resource emphasis. Salvage and/or sanitation may be components in a “green” timber sale, or the primary objective of a project. Although salvage and sanitation would most often occur in lands suitable for timber production, law, policy, and regulation do not preclude the possibility that these activities could occur in lands unsuitable for timber production where harvest is allowed, for other multiple use values. As per FSH 1909.12, 64.31 and 64.32, volume from salvage and sanitation timber harvest is not included in the sustained yield limit, or the projected timber and wood sale quantities.

The potential for salvage harvest is uncertain. However, there is a high level of public interest in this activity. To provide a general analysis, the historic level of salvage harvest disclosed in the affected environment section (2% of wildfire burned acres) could be applied to expected future wildfires on “managed landscapes” (areas where harvest may be allowed), because it is not expected that future salvage would occur to a greater degree than what has been done in the past. All alternatives were similar in the expected levels of fire in managed landscapes (a range of 325,000 to 340,000 acres burned in 50 years), with an average of 334,000 acres. A calculation of 2% of this figure results in approximately 6,700 acres in 50 years, or 1,340 acres per decade, or 134 acres per year. This indicates that salvage would likely occur on a relatively small area in the

future under any alternative. Even so, it is possible that increasing large fires in lands suitable for timber production could result in an increased amount of salvage, when consistent with plan components. This activity could result in additional volume beyond what is predicted by the protected timber sale and wood sale quantities.

Salvage cutting after fire is a controversial management approach. The best available scientific information to disclose the potential effects from salvage is addressed in detail in other resource sections.

### **Reforestation**

By law, stands treated with regeneration harvest would be reforested naturally from seed onsite or by planting within 5 years. The potential for stands to reforest within 5 years after final harvest is one of the guiding principles for determining whether a site is suitable for timber harvest – as required by FSM 2470.3, this determination is made at the stand level during project development even in areas determined to be suitable for timber production at the forest plan level. This determination will be increasingly important given future warm/dry climate conditions. Based on adherence to law, regulation, and policy, it is expected that under all alternatives, stands that are selected for regeneration harvest would be reforested. As described in the affected environment section, the HLC NF has a strong history of reforestation success, and monitoring will help ensure that reforestation methods are adapted as needed.

After natural disturbances, most often reforestation would occur naturally but in some cases planting may be done particularly on lands suitable for timber production, because these lands should be maintained in an appropriately stocked condition per the NFMA. Some burned areas may have difficulty reforesting due to a lack of seed (if the burn was extensive or in a forest type not adapted to stand-replacing burns); harshness of the site; and/or climate conditions that are not conducive to seedling germination and establishment. If artificial reforestation of these areas is not possible, they may be considered no longer suitable for timber production or harvest. In such areas, as well as other unmanaged lands such as wilderness areas, reforestation may either occur slowly over long timeframes (“natural recovery”) or shift to a nonforested vegetation type indefinitely.

The timber and vegetation modeling included anticipated levels of disturbances and regeneration success during warm/dry climate conditions to calculate expected timber outputs. However, there may be an increasing risk of reforestation difficulties in the future based on climate change and large disturbances; refer to the Terrestrial Section for more information on this risk.

### **Prescribed burning**

Under all alternatives, prescribed burning is a possible vegetation management tool. As described in the Fire and Fuels section, prescribed burning is a crucial component in prescriptions designed to reduce hazardous fuels and the risk of wildfire. It is likely to be used at existing or higher levels in conjunction with timber harvest, and as a stand-alone ecosystem treatment.

### ***Timber Demand***

Under all alternatives, it is expected that timber harvest would occur and timber outputs provided in response to timber demand. When timber demand is present and timber can be sold, harvests to accomplish resource management goals can be conducted with low cost to the taxpayer. Some members of the public are concerned about the possibility of local timber infrastructure declining. When a mill operates well below its capacity due to an inability to obtain raw material (timber), there is a possibility that revenue will not cover the fixed costs associated with operating the mill and it could face closure. However, as displayed in the timber supply section, each of the alternatives in the plan suggest that timber harvest from the HLC NF will be higher in the coming decades than in the preceding two decades. Therefore, it is unlikely that anticipated harvest levels from the HLC NF will cause a mill to close. There could be other microeconomic (firm-level) factors or macroeconomic (national or global) factors that would result in a mill infrastructure decline, such as an economic recession. In the event that timber infrastructure declines or is no longer present, vegetation

management projects would become less viable and more costly, and the result would be a reduced capacity to move toward desired conditions. Conversely, if more infrastructure were developed in nearby communities, new opportunities may arise that could enhance the amount and types of material used from NFS lands (for example, more biomass utilization could result in greater volume removal achieved versus the disposal of material in burn piles).

### *Other Forest Products*

Under all alternatives, personal use of special forest products is allowed, so long as the use does not conflict with other management guidance, with the exception of the Tenderfoot Creek Experimental Forest. In this area, personal use of firewood, Christmas trees, boughs, and surface rock is prohibited, although personal use of other materials is allowed. Commercial use of special forest products would not be allowed in designated wilderness, RWAs, the Tenderfoot Creek Experimental Forest, or RNAs.

Fire may influence the availability of some special forest products, such as mushrooms. All alternatives would have similar potential to provide special forest products that are linked to fire. Timber harvest may also increase or decrease the availability of some special products, such as Christmas trees. While the expected levels of harvest vary somewhat, all alternatives have a similar potential to affect special forest products related to timber harvest.

Areas that are suitable for commercial or personal use of special forest products and that allow access by road or trail would provide greater potential opportunities for gathering of special forest products. Conversely, the potential for over-harvest of special forest products may increase. Areas expected to have the most road access are those that are established in the plan as suitable for timber production, because roads are more likely to exist for vegetation management purposes.

### *Climate change and drought*

Climate may influence the availability of timber and other forest products. However, the direct effect of climate on timber production is expected to be small, based on the effects of temperature on disturbance and to a lesser extent on growth and productivity (Halofsky et al., 2018a). Climate change may actually increase timber production in most Northern Rockies forest, but conversely increased disturbances may cause major timber losses (ibid). Additional effects and risks to forests associated with climate change are described in the terrestrial vegetation section.

Climate is integrated into the SIMPPLLE model (and therefore, indirectly PRISM as well). The modeling also included an increase in future disturbances based on best available scientific information and expected reforestation success under warm/dry climate conditions. In addition, moisture stress and reforestation potential were considered when determining the lands that may be suitable for timber production. Sites where tree growth is marginal or there is a risk to regeneration success were not included. These areas include the driest forests, and those most likely to shift to lower densities or nonforested communities given drought and increased wildland fire. The potential that future climate may further inhibit tree growth on currently productive sites exists but the degree of change is unknown due to other factors such as the frequency and intensity of extreme events, stand demography, disturbances, and management practices (Charney et al., 2016). It is also possible that continued drought (and/or associated large disturbances) may cause shifts to nonforested vegetation types on some of the driest lands, and thus the lands suitable for timber production and/or volume outputs could decrease. Because of this, it is important to validate suitability at the project and stand level during implementation of the plan. Based on these assumptions and considerations, to the degree possible the Plan and analysis take steps to avoid overestimating projected timber harvest and resulting economic contributions based on future climate.

As described in the Terrestrial Vegetation section, risk exists for extensive tree mortality events and regeneration failures to a greater degree than predicted in the modeling, which are unquantifiable in time and space. Therefore, there is also a risk that predicted timber volumes and associated economic outcomes may not

be achieved. These events would, by in large, be outside of FS control, and in some cases there could be salvage harvest opportunities to offset potential economic losses. It is not possible to further anticipate possible decreases in expected timber outputs.

The expected change in climate in future decades could also influence availability of other forest products. Increased frequency or severity of fire could cause changes on the landscape in plant species compositions or abundance. Uncertainty exists regarding possible effects of climate change on vegetation, and thus on the availability and distribution of plants that may be gathered as special forest products.

#### *Effects from forest plan components associated with:*

##### **Geology, energy, and minerals**

There are no plan components under any alternative associated with mining, energy, and minerals that would directly impact the timber resource, or expected timber harvest and volume outputs. Mining undergoes site-specific analysis to determine effects and required mitigation, and effects to vegetation is determined at the project level. Generally, the impacts to timber from mineral extraction are very minor and localized.

##### **Land status and ownership**

Under the action alternatives, the timber resource may be indirectly affected by FW-LAND-OBJ-01, FW-LAND-GDL-01, and FW-LAND USE-GDL-01. To the extent that these components encourage or result in increased administrative access to NFS lands, the feasibility of potential timber projects in those areas may be improved. The magnitude of this beneficial effect is difficult to predict and would depend upon site-specific timber opportunities. This effect would be similar for all action alternatives but would not likely result in changes that would be measurable at the forestwide scale in terms of timber harvest or volume outputs. The existing 1986 Forest Plans (no-action alternative) include specific plan components related to acquiring land with high wildlife, recreation, and watershed values, and lands that allow access to NFS lands. These components encourage land acquisition more explicitly than the action alternatives, but in practice the net effect (potential increased access or lands to contribute to timber harvest and productivity) is likely to be similar across all alternatives.

FW-LAND USE-GDL-02 would also inform timber harvest treatments that may occur within corridors for linear transmission facilities. Such areas are excluded from lands that may be suited for timber production, but harvest may occur for other multiple use values. This guideline would be addressed in site-specific project design and may both encourage harvest (where needed to meet facility safety requirements) and limit the intensity of harvest (where needed to reduce visual impacts). Therefore, there is likely no net effect (positive or negative) related to potential timber harvest and volume outputs.

##### **Cultural, historic, and tribal resources**

All of the alternatives include plan components designed to promote cultural, historical, and tribal resources, specifically to protect them from damage associated with timber harvest. Some larger sites are specifically excluded from the mapping of lands suitable for timber production under the action alternatives (such as the Lincoln Gulch Historic District); however, many small sites are scattered across the landscape within the lands suitable for timber production or where harvest can occur for other multiple use purposes. In addition, there may be sites that have not yet been located. All known and unknown sites would be similarly protected by law, regulation, and policy under all alternatives. The reductions to timber harvest and production related to these protections would be minor and not affect forestwide estimates made with PRISM.

##### **Infrastructure**

The action alternatives include components that would encourage the presence of a transportation system to provide administrative access to NFS lands (FW-RT-DC-01, FW-RT-OBJ-02, FW-RT-OBJ-03); these components help ensure there is access for timber harvest activities. Standards and guidelines for roads, trails, and bridges (FW-RT-STD; FW-RT-GDL; and FW-BRDG-GDL) may impact the design of the work and costs associated with maintaining roads needed to implement timber harvest activities. These needs are included



indirectly in the PRISM modeling, based on the cost assumptions to implement harvest. These components would also ensure that roads are maintained in a satisfactory manner to support future harvest projects. The 1986 Forest Plans (no-action alternative) also include standards related to roads and bridge construction and maintenance that, along with forest manual direction, in practice would result in similar effects with regard to the timber resource.

In all alternatives, limits related to road access on existing roads as well as construction of new roads (both permanent and temporary) could impact the ability to conduct harvest on portions of the forest, due to lack of economically feasible access. The magnitude of this influence cannot be calculated but is implied within ROS settings that are included in PRISM.

**Effects common to all action alternatives**

All Action Alternatives contain the same plan components for timber and other forest products, with the exception that the objectives reflect different timber volume outputs by alternative. The action alternatives provide direction for sustainable levels of forest products. Forestwide timber plan components include limitations on timber harvest required by law. These components collectively ensure that harvest is conducted within law and policy, is sustainable over time, and is designed to move the forest towards desired vegetation conditions. The expected effects of each timber plan component for the action alternatives is summarized in Table 259.

**Table 259. Plan components for timber (TIM) and other forest products (OFP) – all action alternatives**

Plan Component(s)	Summary of expected effects
FW-TIM-DC-01, 02, 03, 04	The suite of timber DCs are expected to encourage the use of timber harvest to maintain the resilience of lands suitable for timber production and minimize economic losses; contribute to the economic sustainability of local communities; respond to market demand; and achieve desired vegetation conditions. This would result in a regular timber harvest program which would in turn contribute to providing the coarse filter of desired vegetation conditions on the landscape.
FW-TIM-GO-01	This goal would result in the HLC NF contributing to the viability of regional timber infrastructure and small businesses.
FW-TIM-OBJ-01, 02	These objectives vary across alternatives and would help ensure that a regular timber harvest program is conducted to meet the FW-TIM-DCs. The objectives are based on a reasonably foreseeable budget; however, a footnote also recognizes the potential level of timber production that could be achieved with an unconstrained budget, while still adhering to all other plan components and resource constraints. This provides a range of outcomes that may be possible. The objectives describe a reasonable range around the projected timber volumes estimated from PRISM, as described in the <i>Effects that vary by alternative</i> section.
FW-TIM-STD-01, 02	STD-01 ensures that harvest would not irreversibly damage soil or watershed conditions. STD-02 ensures that reforestation as appropriate would occur within 5 years after final regeneration harvest, based on a silvicultural prescription. These standards may result in project-level field reviews determining that some stands are not suitable for timber harvest but are not expected to materially change the volume projections displayed in FW-TIM-OBJ-01 and 02.
FW-TIM-STD-03	This standard ensures that harvest treatments are not selected based solely on economic return; this would allow that all resources and the purpose and need of the project are also considered.
FW-TIM-STD-04	This standard would ensure that clearcutting is only used when it is the best method to achieve the purpose and need.
FW-TIM-STD-05	This standard would ensure that timber harvests are consistent with the desired scenic conditions of the landscape.

Plan Component(s)	Summary of expected effects
FW-TIM-STD-06	This standard would help ensure that volume production is maximized on the landscape, by not allowing for regeneration harvest to occur prior to the culmination of growth except in specific circumstances.
FW-TIM-STD-07	This standard would ensure that the average volume sold per year in a given decade does not exceed the sustained yield limit, thereby ensuring that the timber harvest program is sustainable.
FW-TIM-STD-08; 09; 10	FW-TIM-STD-08 limits the maximum size allowed for regeneration harvests to ensure harvests do not create unnaturally large patches that are inconsistent with other resource needs. For the HLC NF, the maximum allowed size is 75 acres. FW-TIM-STD-09 clarifies that exceptions to this size requires public review and Regional Forester approval. FW-TIM-STD-10 ensures that the patch size limitation is not applied to stand-replacing disturbance events. Please see the section below for additional discussion.
FW-TIM-GDL-01	This guideline ensures that timber harvests are designed to help the Forest or GA move towards the desired conditions for vegetation and other resources.
FW-TIM-GLD-02	This guideline would result in harvests on lands unsuitable for timber production are only conducted for certain purposes.
FW-TIM-GDL-03	This guideline would ensure that when salvage products are conducted, burned trees are retained as needed to meet the habitat needs of wildlife species.
FW-TIM-SUIT-01, 02	These suitability statements clarify that the lands suitable for timber production are identified in the maps for each GA (Chapter 3); and that timber harvest is suitable on all lands unless otherwise specified in plan components.
FW-OFP-DC and GDLs	These components would support sustainable levels of other forest products, including firewood and Christmas trees.
EH-TIM-GDL-01; EH-TIM-SUIT-01; EH-WDL-GDL-01	The guideline restricts the harvest of timber or other forest products in elk winter range to the nonwinter season in the Elkhorns GA specifically; and the guideline specifies that the GA is unsuitable for timber production. Based on EH-WL-GDL-01, any harvest that occurs in this GA would be compatible with wildlife values.
SN-TIM-GDL-01	This guideline would direct managers to emphasize timber harvest as a tool to achieve purposes such as ponderosa pine habitat restoration in the Snowies GA.
UB-WL-GDL-01	This guideline would restrict harvest to some extent in some key locations for wildlife connectivity in the Upper Blackfoot GA.
Geographic Areas (Chapter 3)	Each GA includes a map the lands suitable for timber production, and components to complement the forestwide plan components for all resources, including timber harvest considerations. GAs also include maps of recreation opportunity spectrum settings, SIOs, and special designations which would guide timber harvest.

### *Timber and Harvest suitability*

The lands determined to be suitable for timber production under the action alternatives are a subset of the lands that *may be* suitable (Figure 34), as described in appendix H. This determination is made based on the resource objectives on the landscape and varies by alternative as described in the *Effects that vary by alternative* section. Broad-scale information is used to determine suitability. Changes to the determination lands suitable for timber production based on site-specific field reviews would be monitored during implementation of the Plan. The following common factors were used in determining suitability for each alternative, based on plan components that would not be consistent with timber production as a primary or secondary objective.

- RWAs are not suitable for timber production.
- Several emphasis areas were eliminated from lands suitable for timber production, when included in an alternative: South Hills Recreation Area, Missouri River Corridor, Smith River Corridor, Elkhorns Wildlife Management Unit, Grandview Recreation Area, and the Badger-Two Medicine Area.
- Although there are no suitability statements for timber production or harvest in the Plan based on recreation opportunity spectrum (ROS) settings, the map of these settings was used as a reference to

identify areas where the transportation system, potential future access, and desired vegetation conditions are not consistent with timber production.

- Eligible wild and scenic river corridors and riparian management zones (RMZs) are not considered suitable for timber production in any alternative.
- Other cultural or historical sites were eliminated from the lands suitable for timber production.
- Depending on the alternative, some GAs or specific areas were eliminated from suitability based on marginal growth potential, limited access, and/or other management emphasis.

Other land allocations such as conservation watersheds and municipal watersheds were not considered in delineation of lands suitable for timber production, because the plan components for those areas are not necessarily inconsistent with timber production as a primary or secondary objective. There are also other considerations, such as wildlife connectivity, which may influence timber project placement and design but are not included in the delineation of lands suitable for timber production.

Under all action alternatives, there are suitability plan components that explicitly prohibit harvest in certain areas. Although the total acres and areas considered varies by alternative, the areas where harvest is not permitted include designated wilderness areas, RWAs, and wilderness study areas.

#### *Timber supply: sustained yield limit*

Timber supply was calculated based on metrics defined in the 2012 Planning Rule using the PRISM model. The only metric that is the same for all action alternatives is the sustained yield limit. Sustained yield limits must be calculated for each proclaimed forest based on all lands that *may be* suited for timber production, not including salvage or sanitation volume. Refer to appendix H for detailed information regarding the calculation of this metric. The sustained yield limit is 5.75 mmcf (31.21 mmbf) per year on the Helena NF; and 4.95 mmcf (26.36 mmbf) per year on the Lewis and Clark NF. The combined sustained yield limit is 10.7 mmcf (57.57 mmbf). The projected timber sale quantity may not exceed this amount.

The sustained yield limit increased between the DEIS and FEIS because of key modeling improvements. The factors that most likely caused the sustained yield limit to increase was the correction of the assumptions made to lodgepole pine forest attrition, and distribution future disturbances proportionately on suitable versus unsuitable lands according to historic trends. Under all alternatives, the sustained yield limit and levels of expected timber volume output are less than the total growth estimated on the HLC NF. Based on the estimates of growth (minus mortality) presented in the affected environment section, the sustained yield limit is roughly half of the total average annual growth per acre estimated on lands suitable for timber production on the HLC NF. This is because sustained yield limit reflects a nondeclining even flow over a long timeframe and incorporates the expected effects of future disturbances.

#### *Maximum size of even-aged harvest openings*

NFMA and the 2012 Planning Rule directives require that limits be placed on the maximum sizes allowed for even-aged regeneration harvests. The NRV analysis of patch sizes created for 1 period as described in the *Terrestrial Vegetation affected environment, landscape patch and pattern section* was used to inform the standard for maximum patch size of even-aged regeneration harvest (FW-TIM-STD-08), to contribute to desired landscape patterns. The modeling shows that a maximum opening greater than 40 acres would better reflect natural patterns. The forestwide patch number was used to inform FW-TIM-STD-08 because it avoids the issue of PVT mapping artificially reducing the functional patch size. The maximum even-aged regeneration harvest opening size limit of 75 acres in FW-TIM-STD-08 represents a point below the average but within the range of the forestwide NRV, and does not exceed the maximum end of the range for any single PVT. The maximum opening number does not reflect the high end of historical conditions, but rather a midpoint. Refer to appendix H for more information. Figure 230 in appendix H shows the relationship between the 75-acre opening limit, the NRV range of early successional forest patches, and the expected patch size in 50 years for all alternatives. The expected trend of patch sizes is discussed in the Terrestrial Vegetation section.

The effect of FW-TIM-STD-08 is that even aged harvest opening sizes would generally be constrained to 75 acres, unless exceptions apply (e.g., catastrophic mortality). This may influence the amount or placement of treatment units or the selection of prescription types, and in some cases reduce the amount of timber volume cut. However, this opening size could be exceeded, with Regional Forester approval, if a site-specific analysis supports it, as allowed by FW-TIM-STD-09. The ecological importance of patches larger than 75 acres is indicated by the NRV 95th percentile range of the average patch size (up to 151 acres forestwide) as well as the area weighted mean patch size (up to 14,051 acres forestwide).

**Alternative A, no action**

Alternative A is bounded by the forest plan components found in the 1986 Forest Plans developed under the 1982 Planning Rule. The expected effects of plan components related to timber for the action alternatives is summarized in Table 260.

**Table 260. Plan components for timber and other forest products, alternative A**

Plan Component(s)	Summary of expected effects
Helena National Forest	
Forestwide Timber Standard, II/23(1)	This standard describes the requirements from the NFMA, such as requiring silvicultural prescriptions and using clearcutting only where it is the optimum method. This component is similar to components in the Plan and would ensure that timber activities are consistent with the law.
Forestwide Timber Standard, II/23 (3)	This standard for the design of transportation plans and logging systems would ensure that these are efficient and meet the needs of other resources.
Forestwide Timber Standard, II/23 (4)	This standard describes the 40-acre opening maximum. In contrast to the action alternatives, this standard does not supply an exception to the size limit. This standard would ensure compliance with the NFMA.
Forestwide Timber Standard, II/23 (5)	This standard requires feasibility analyses of sales over one million board feet and would help ensure that timber sales are economically viable.
Forestwide Firewood Standards, II/24 (1-6)	These components would help ensure a viable firewood program is provided.
Management Areas (III/2-III/93)	Management area guidance describes what areas are suitable for timber production. Components include the required visual quality objectives and other resource objectives (such as recreation, wildlife, range, soil, water, and minerals) that would guide and potentially limit timber harvest.
Lewis and Clark National Forest	
E1 (Timber Management), E2 (Firewood), E-3 (Reforestation), E-4, (Timber Harvest)	These standards provide detailed guidance for timber and other forest products, including reforestation requirements, riparian considerations, soils, cultural resources, old growth forest, threatened and endangered species, economic feasibility of timber sales, and grizzly bears. The standards ensure compliance with law and policy.
Management Areas (Chapter 3)	Management area guidance describes what areas are suitable for timber production. They also state the required visual quality objectives and other resource objectives (such as recreation, wildlife, range, soil, water, and minerals) that would guide and potentially limit timber harvest.

**Timber Suitability**

Timber suitability for the no-action alternative is based on the 1986 Forest Plans as amended and implemented, as shown in Table 257. The total land area considered suitable for timber management under the no-action alternative is roughly 14% of the HLC NF. Timber harvest would be allowed on lands unsuitable for timber production for purposes other than timber production, when consistent with other management direction. In alternative A, lands unsuitable for timber production where harvest is allowed represent roughly 50% of the

HLC NF, although harvest may be very limited in some of these areas depending on management direction and objectives, as well as existing vegetation conditions.

**Timber Supply**

Timber supply metrics for the no-action alternative would be as described in the affected environment, including the allowable sale quantities (total 27 mmbf for the HLC NF). However, due to regulatory changes on the landscape, including changes to the areas that may be suitable for timber production, the estimates in the 1986 plans no longer reflect the management situation if alternative A were selected. To make direct comparisons to the action alternatives, a projected timber sale quantity and projected wood sale quantity following current handbook requirements are calculated for alternative A, both with and without a reasonably foreseeable budget constraint, and displayed in the *Effects that vary by alternatives* section below. Although not directly comparable, these volume levels are relatively similar to the allowable sale quantities estimated in 1986.

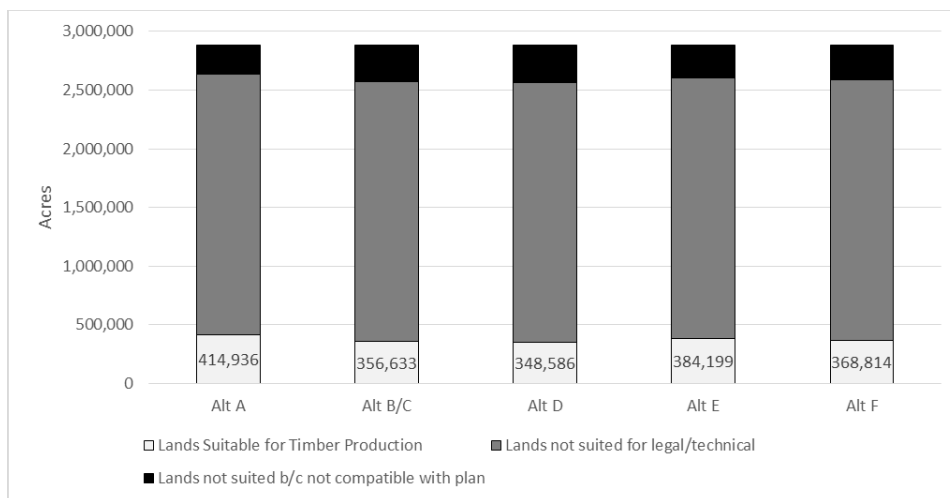
**Timber Harvest and associated activities**

The harvest levels achieved during the implementation of the 1986 plans to date is shown in the affected environment section. PRISM was used to estimate the expected acres of harvest treatments that would occur under alternative A, based on existing management direction found in the 1986 plans as well as new laws and regulation and the updated lands suitable for timber production (Table 257). These results are shown in the *Effects that vary by alternatives* section.

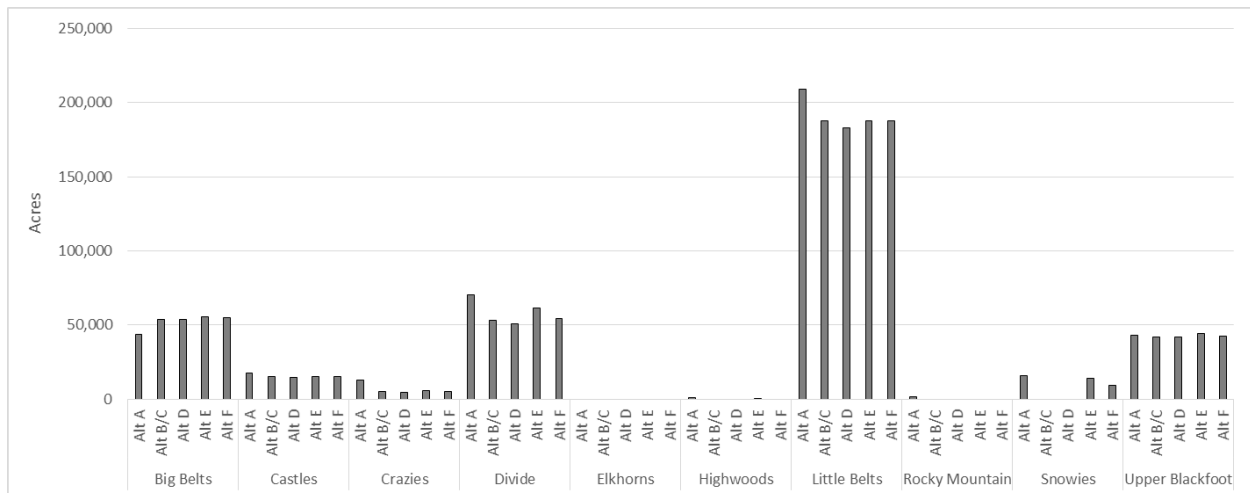
**Effects that vary by alternative**

**Timber Suitability**

Based on management guidance and desired conditions, the lands suitable for timber production vary by alternative, as shown in Figure 35 and Figure 36 (see also appendix H). At the forestwide scale, alternative D has the least amount of land suitable for timber production. Alternative A has the most (about 65,000 acres more than D) because RMZs are not excluded east of the continental divide. The lands suitable for timber production in alternatives B/C and D represent roughly 12% of the HLC NF; alternatives E and F represent 13%; and alternative A 14%. There is relatively little variance because of the legal and technical factors that do not vary by alternative, such as the inherent capability of the land and designations such as IRAs. The GAs with the most lands suitable for timber production are the Big Belts, Divide, Little Belts, and Upper Blackfoot.

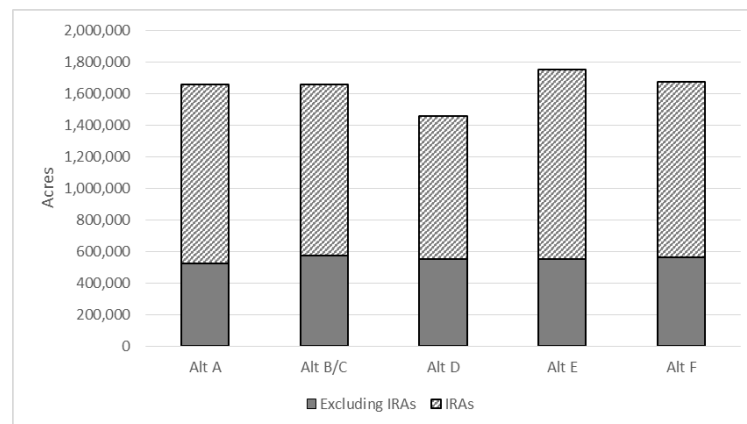


**Figure 35. Lands suitable for timber production, forestwide, by alternative**

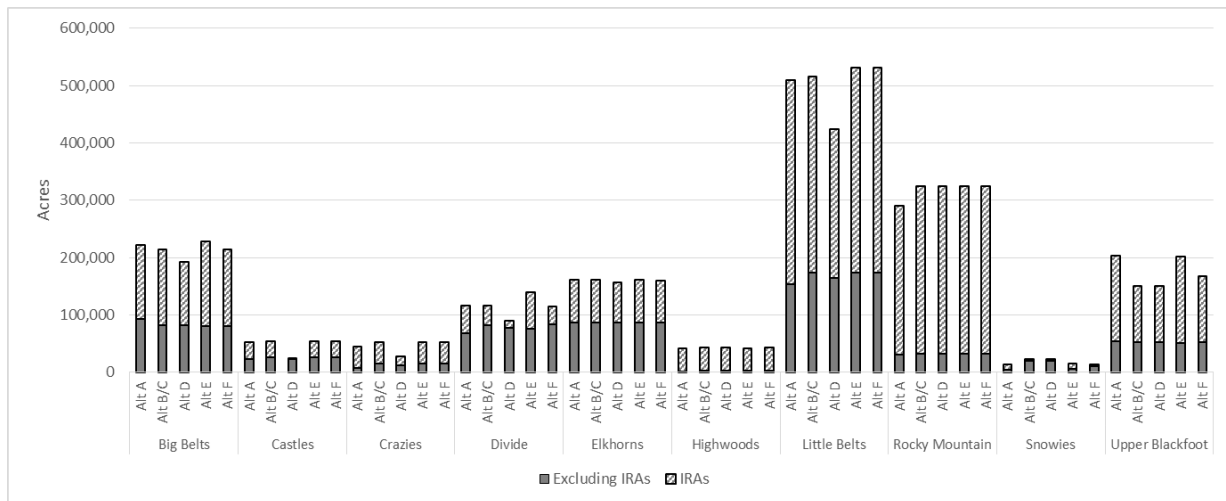


**Figure 36. Lands suitable for timber production, by GA, by alternative**

The area where harvest may be allowed on lands unsuitable for timber production also varies by alternative. Appendix H provides the acres of these lands by alternative at the forestwide scale and for each GA, which are summarized in the figures below. The total acres as well as those that are within IRAs are displayed. This distinction is useful because within IRAs, limited harvest could occur per the 2001 Roadless Area Conservation Rule. In all alternatives, IRAs make up a majority of the lands that are unsuitable for timber production where harvest may occur. Forestwide (Figure 37), alternative E has the most of these lands total and alternative D has the least, but alternatives F, B/C, and D have slightly the more acres that occur outside of IRAs. The acres shown include nonforested vegetation types where little to no harvest would occur. There is some variability across alternatives at the GA scale (Figure 38), generally as a function of RWAs that are included in one or more alternatives.



**Figure 37. Lands unsuitable for timber production where harvest may occur forestwide**



**Figure 38. Lands unsuitable for timber production where harvest may occur by GA**

*Timber Supply*

Projected timber and wood sale quantities were estimated using PRISM, with and without a reasonably foreseeable budget constraint. The model was run with objective functions based on the theme of the alternative and incorporated all resource constraints consistently. Alternatives A, B/C, and D had the objective to move towards vegetation desired condition as quickly as possible. Alternative E had an objective to maximize timber production and then move towards desired conditions. Preferred alternative F was run with a blend of those objectives (see appendix H).

Projected timber and wood sale quantities are annual outputs averaged across each decade. Appendix H provides detailed tables of these values for each alternative, constrained and unconstrained by budget, in mmcf and mmbf. Table 261 displays these metrics in mmbf for Decade 1 of the plan period. Alternatives A, B/C, and D are similar; Alternative E is higher; and preferred alternative F represents a midpoint in the range. Alternative E has the highest projected timber and wood sale quantities. However, alternative E also does less to meet the desired future vegetation conditions, as discussed in the “desired condition departure score” section. Preferred alternative F produces slightly less volume than alternative E, but does nearly as well at desired condition attainment as A/B/C/D.

**Table 261. Projected timber and wood sale quantities for decade 1 by alternative; constrained and unconstrained by budget (mmbf)**

Alternative	PTSQ constrained	PTSQ unconstrained	PWSQ constrained	PWSQ unconstrained
Alternative A	22.49	34.05	25.86	39.16
Alternative B/C	23.23	37.41	26.71	43.03
Alternative D	23.33	36.54	26.83	42.02
Alternative E	32.82	41.20	37.74	47.38
Alternative F	27.30	37.60	31.40	43.24

Table 261 shows the projected volume outputs for decade 1 of the planning period. To ensure the volumes projected are sustainable, the PRISM model was run for 150 years, or 15 decades. The first 5 decades of this projection reflect the most likely outcomes of the planning period; the volumes projected are displayed in more detail in appendix H. To encompass the variability in volume projections across the first 5 decades of the projection, as well as to encompass the potential for increases in organizational capacity, the objectives for

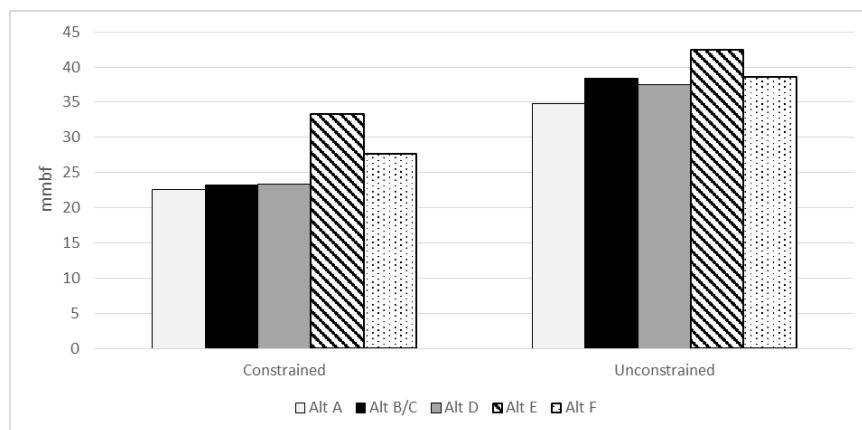
PTSQ and PWSQ in the Plan for the action alternatives (FW-TIM-OBJ-01 and 02 respectively) include a range of volume outputs, as shown in Table 262. In addition, a footnote to each objective includes the unconstrained timber volume output, so that the Plan reflects an ecologically sound timber volume objective that may be achievable if budgets were to substantially increase.

**Table 262. PTSQ and PWSQ plan objectives (FW-TIM-OBJ 02 and 02) by action alternative**

Alternative	PTSQ	PTSQ Footnote <sup>1</sup>	PWSQ	PWSQ Footnote <sup>1</sup>
Alternative B/C and D	15-30 MMBF (3-6 MMCF)	39 MMBF (7.9 MMCF)	25-45 MMBF (5-9 MMCF)	46 MMBF (10.3 MMCF)
Alternative E	25-40 MMBF (5-8 MMCF)	44 MMBF (8.7 MMCF)	40-50 MMBF (8-10 MMCF)	51 MMBF (11.4 MMCF)
Alternative F	20-35 MMBF (4-7 MMCF)	38 MMBF (7.9 MMCF)	30-45 MMBF (6-9 MMCF)	46 MMBF (10.5 MMCF)

<sup>1</sup> The footnotes for the objectives reflect the maximum volume achieved in the unconstrained budget scenario from PRISM during any of the first 5 decades (as opposed to Table 261, which shows the values for Decade 1 only). PWSQ is measured as MMCF only in the Plan, because it includes volume that is not measurable by board feet; however, the MMBF for PWSQ is also shown here for comparison purposes.

A comparison of the results constrained and unconstrained by budget is useful to understand the potential range of future effects. Figure 39 displays the impact of budget projected timber sale quantity. The trend across alternatives is similar with both scenarios (alternative E achieving the most volume output, followed by F, B/C, D, and then A). With a constrained budget, alternatives A, B/C and D are nearly identical, even though alternative D has more RWAs. Alternative E would remove the most volume, followed by alternative F. With the budget constraint removed, there is more differentiation across alternatives. Removing the budget constraint increases timber production by roughly 25%. The unconstrained budget runs include all other resource constraints; therefore, these outputs represent what could be generated given the ecological conditions, regulatory framework, and management emphasis of each alternative. To achieve the increased outputs, budgets would have to increase by the magnitude of \$5M to \$7M per year depending on the alternative and period. The sensitivity analysis (appendix H) conducted for PRISM confirmed that budget was the most influential constraint on volume outputs, planned harvest, and movement towards desired conditions.

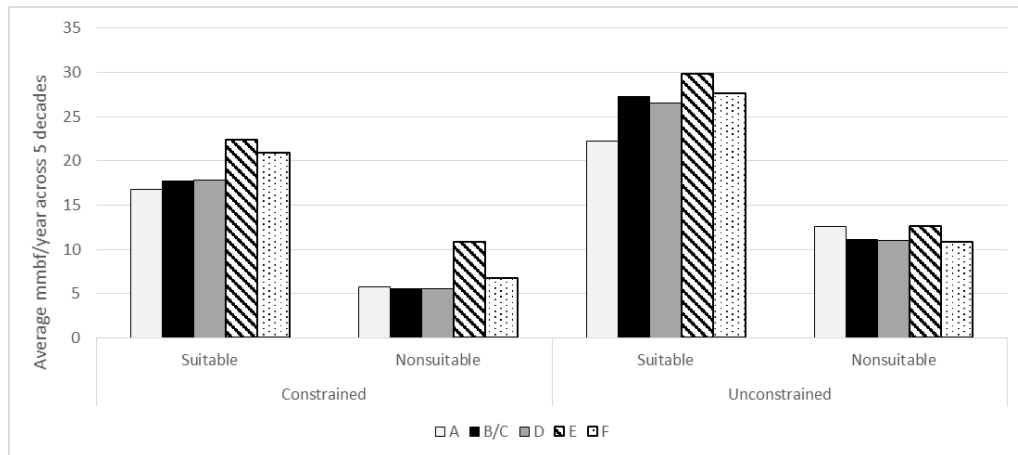


**Figure 39. Average PTSQ (mmbf/year) across 5 decades by alternative, with and without a budget constraint**

It is also useful to summarize how much volume is produced from lands suitable for timber production versus those lands where harvest may occur for other multiple use purposes. As Figure 40 shows, substantially more volume is expected from lands that are suitable for timber production under both budget scenarios. Alternative E generates the most volume from both land classifications. The model projected roughly twice to three times



as much volume is removed from lands suitable for timber production as on lands that are unsuitable, depending on alternative and budget scenario.

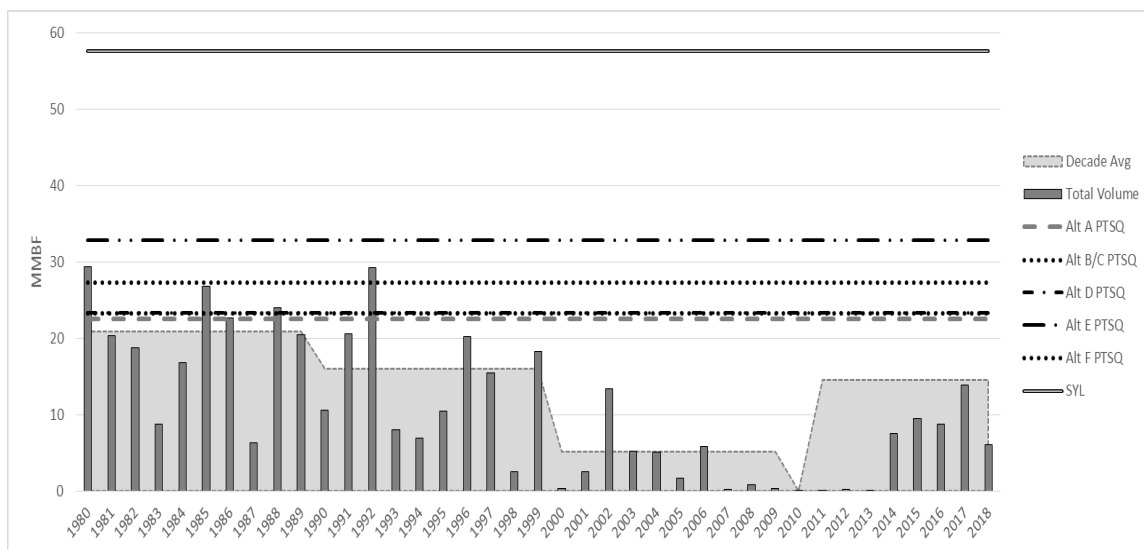


**Figure 40. Average PTSQ (mmbf/year) across 5 decades by alternative, in lands suitable and unsuitable for timber production, with and without a budget constraint**

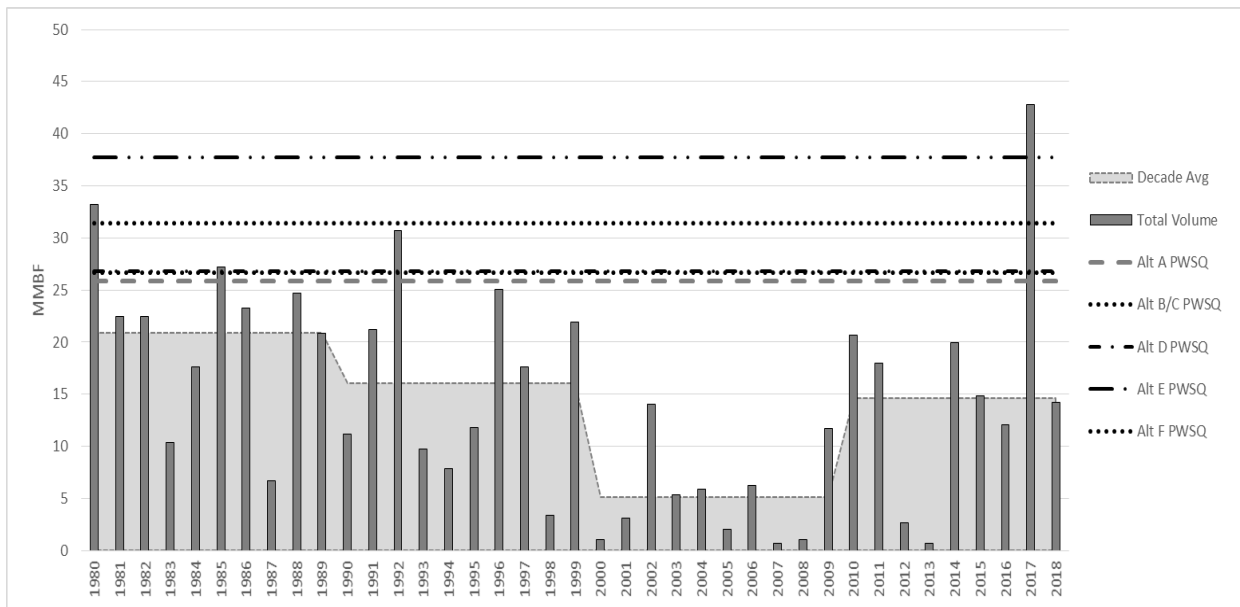
As described in the *Effects Common to All Action Alternatives*, the sustained yield limit is constant (10.7 mmcf or 57.57 mmbf); and the projected timber sale quantity must be below this level. The projected timber sale quantity for all alternatives, with or without a budget constraint, does not exceed this level.

Figure 41 and Figure 42 display projected timber and wood sale volumes by alternative constrained by budget, compared to historic volume outputs (1980-2018). The decadal averages from 1980-2018 are shown as a backdrop and the average annual outputs displayed in bars.

- In Figure 41, the sustained limit is shown because it applies to projected timber sale quantity. Projected timber sale quantity is compared to historic sawtimber sold, because both metrics include timber that meets merchantability specifications.
- In Figure 42, projected wood sale quantity is compared to all timber products volume sold, which includes material that does not meet merchantability specifications (e.g., fuelwood and nonsaw material).



**Figure 41. Past and projected sawtimber volume outputs (average annual mmbf) with a budget constraint by alternative**



**Figure 42. Past and projected volume outputs of all timber products (average annual mmbf) with a budget constraint by alternative**

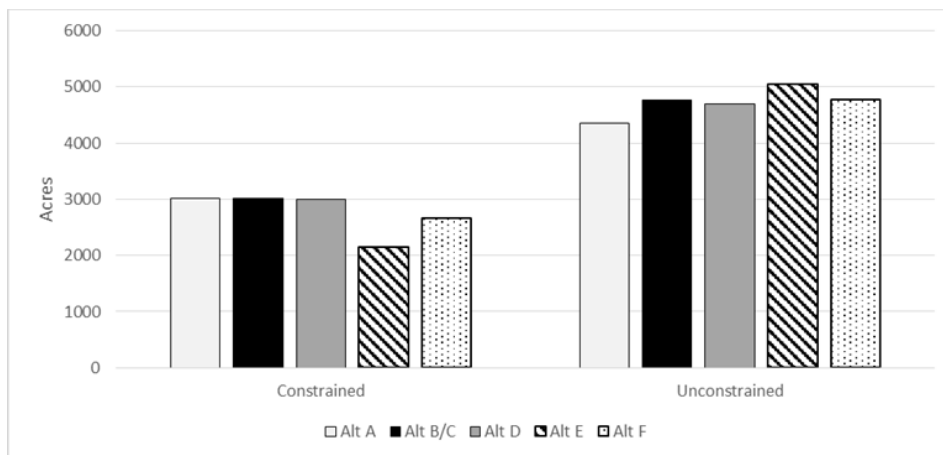
These data show that the decadal averages of actual volume sold from 1980 to 2018 are below the budget-constrained projected timber and wood sale quantities for all alternatives, even though some individual yearly volumes sold (e.g., 1980, 1985, 1992, and 2017) are within the ranges. This indicates that under the Plan timber outputs may exceed the average levels of the past, although other factors, such as actual budgets received and objection/litigation processes, are not reflected. None of sawtimber volumes produced in the past or the projected in the future approach the sustained yield limit. Further, the projected timber sale quantities unconstrained by budget (Table 261) are also below this limit, because of the other plan components and resource constraints that must be incorporated regardless of budget levels.

**Timber Demand**

Alternative selection for the Plan would not directly affect timber demand but may have some impact on timber supply elasticity and solvency for regional or state firms. Flexible timber supply chains are important for mills remaining in Montana to compete and scale to meet national and international lumber demand. As observed in Figure 31, the timber processing capacity of the remaining mills in Montana exceeded harvest by about 200 mmbf Scribner according to the most recent data (T. Morgan, 2019). Across alternatives a net wood quantity difference of 11.88 mmbf (alternative E compared to alternative A) exists in the first decade of the plan period, which represents about 2% of statewide capacity. Generally, substitution occurs where there is a mix of public and private land forests available to a mill. However, in counties such as Broadwater or Deer Lodge, and for a few of the most NF timber-dependent of planning area firms, the HLC NF alternative selection may have a direct impact on supply availability and subsequently sawlog prices.

**Timber Harvest and associated activities**

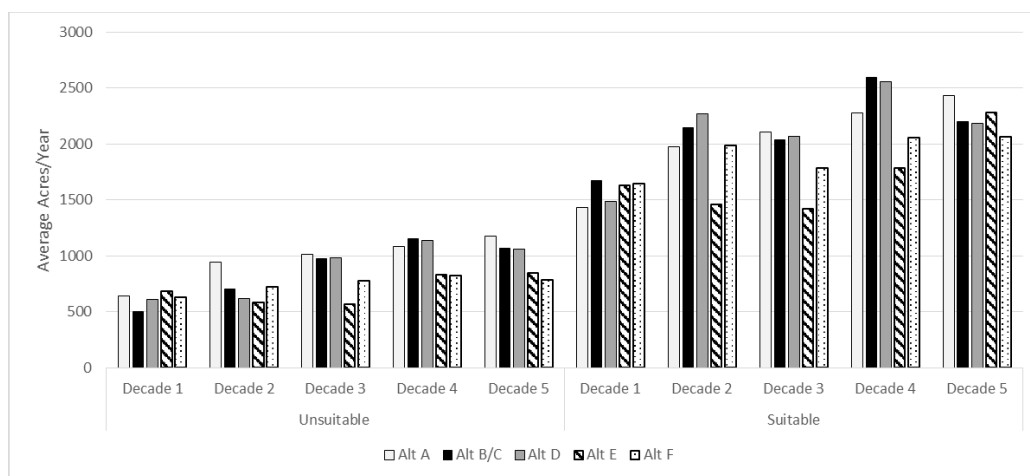
Figure 43 displays the projected acres of harvest that may occur to achieve the volumes shown in the previous section, with and without a budget constraint, averaged across 50 years. This shows that on average across the modeling period, with a constrained budget alternatives A, B/C, and D harvest the most acres, followed by F, and alternative E harvests the least. Alternative E achieves greater volume outputs by treating fewer, higher volume stands more intensively than the other alternatives. With an unconstrained budget, alternative E harvests slightly more acres than the other alternatives, with alternatives B/C, D, and F similar to one another, and alternative A harvesting the least. To achieve these acres, budgets would have to increase by the magnitude described in the timber supply section.



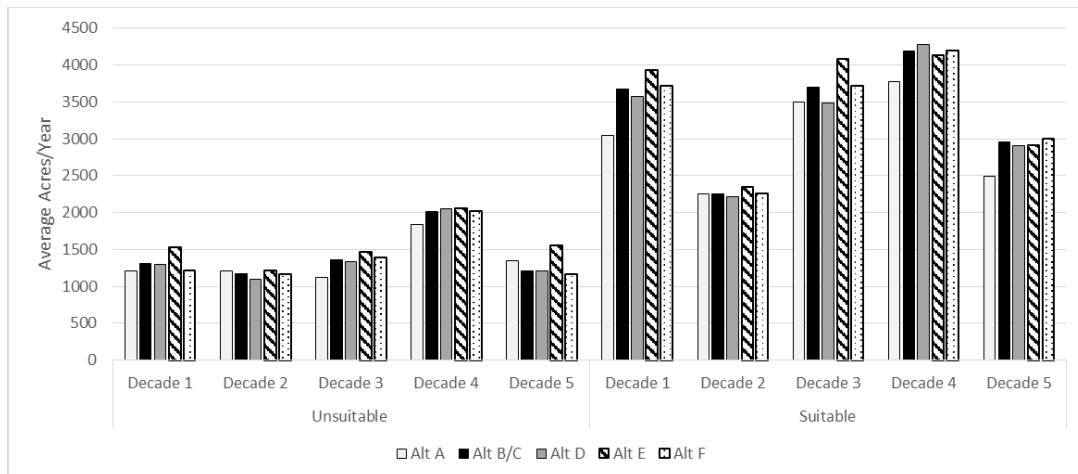
**Figure 43. Average harvest acres/year over 5 decades, by alternative, with and without a budget constraint**

As shown in appendix H as well as appendix C of the Plan, the model predicts a mix of even-aged regeneration harvest and other harvest (intermediate and uneven-aged harvest). The ratio of these harvest types varies by decade, depending on the most optimum solution identified by the model. PRISM generally projected a higher proportion of even-aged regeneration harvest as opposed to intermediate harvest. This was in part due to the desired conditions specified which are not always translated intuitively by the model. During plan implementation, the appropriate prescription and type of harvest for a stand would be determined site-specifically during project design and analysis, based on the suite of desired conditions in the forest plan.

Figure 44 and Figure 45 display the amount of harvest treatments projected to occur in lands suitable versus unsuitable for timber production, with and without a budget constraint. More harvest is planned on lands suitable for timber production under all alternatives. In a constrained budget scenario, alternatives A, B/C, and D tend to plan the most harvest on unsuitable lands; this is because of the driving objective to achieve desired conditions, which emphasize dry types such as ponderosa pine which are more likely to be found in unsuitable areas. However, in an unconstrained budget scenario, Alternatives E and/or F tend to apply the most harvest on unsuitable lands, because without a budget limitation these alternatives can maximize both timber production and desired condition attainment.

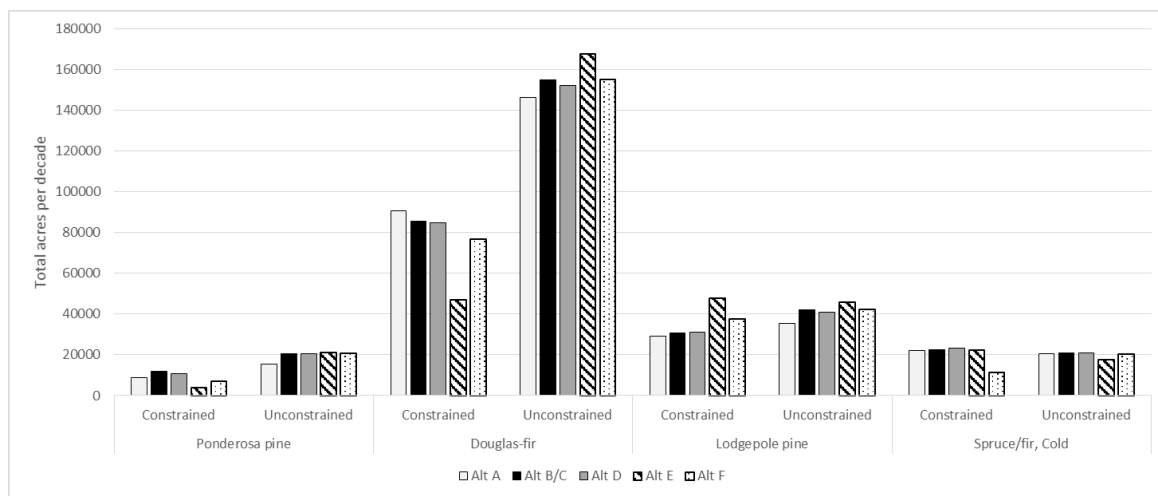


**Figure 44. Total harvest on lands suitable versus unsuitable for timber production, by alternative and decade – with a constrained budget**



**Figure 45. Total harvest on lands suitable versus unsuitable for timber production, by alternative and decade – with an unconstrained budget**

The differences in the alternatives can also be demonstrated by the vegetation types the model chose to harvest, as shown in Figure 46. In decade 1, under a constrained budget, alternative E treats the most lodgepole pine, and relatively less ponderosa pine or Douglas-fir as compared to the other alternatives, due to its objective of maximizing timber production rather than attainment of desired conditions. With an unconstrained budget, the amounts of treatments by vegetation type are more similar and consistent across alternatives. PRISM used desired conditions for vegetation type and structural class. More complex parameters for desired conditions were not possible in the model design. These are broad depictions of the desired condition at the forestwide scale, and should not be misinterpreted to indicate that harvest treatments would not be appropriate in cool moist forests to contribute to other desired conditions, such as individual tree species presence, vertical structure, and/or landscape pattern (patch size).

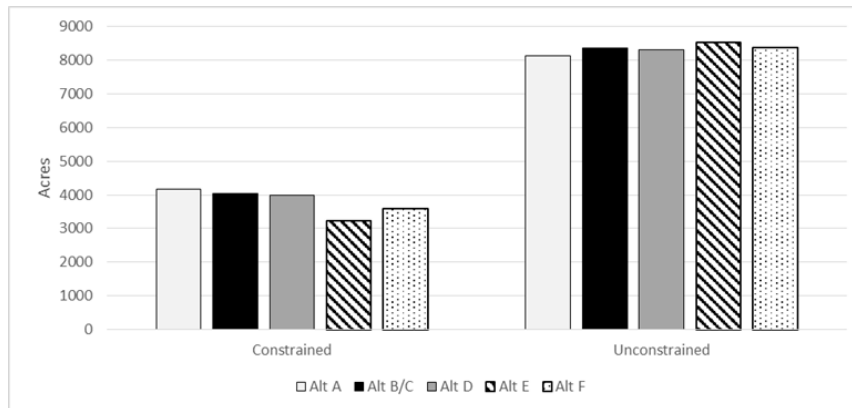


**Figure 46. Projected harvest acres by vegetation type by alternative for decade 1**

**Prescribed burning**

PRISM included prescribed burning in forested areas. Burning was applied as maintenance treatments within harvested stands, as well as a stand-alone prescription in some areas to move towards the desired conditions. Additional burning would occur in nonforested vegetation types, which are not included in the PRISM model. The ability to achieve burning is uncertain and dependent upon many factors including weather windows. As

shown in Figure 47, under the constrained budget scenario alternatives B/C and D, followed by F, burn the most acres while alternative E burns the least. This is because alternative E focuses its budget on harvest to achieve its objective of maximizing timber production. Under an unconstrained budget scenario, all alternatives are fairly similar and similar to existing levels of prescribed burning (not considering burns in nonforested vegetation types). The forest currently conducts roughly 130,000 acres on average per decade, or 13,000 per year, based on accomplishment records from 1980 to 2013. The PRISM projections are lower than this level but only represent forested vegetation.



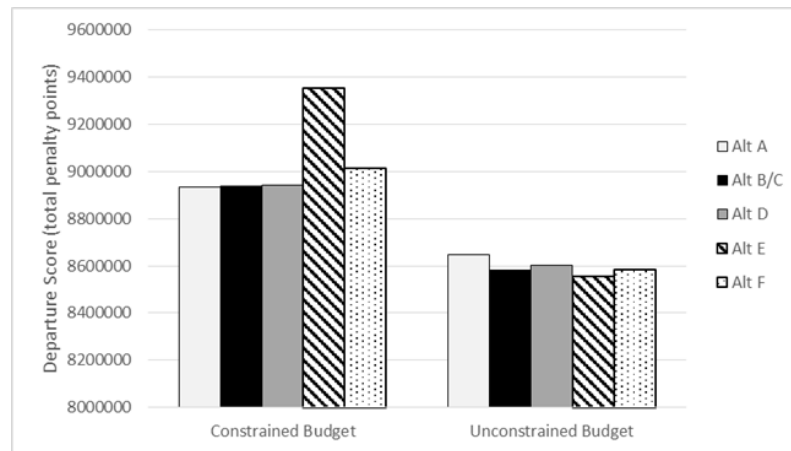
**Figure 47. Average total prescribed burning acres/year over 5 decades, by alternative, with and without a constrained budget**

The unconstrained prescribed fire acres from PRISM reflect potential burning without a budget limitation, up to a 10,000 acre/year cap. This cap is based on operational limitations that indirectly include budget with respect to available personnel and equipment. Therefore, this cap effectively introduces a budget limitation to prescribed fire predictions once the 10,000 acre threshold is reached. A fully unconstrained budget scenario would likely result in higher prescribed burning acres than shown – potentially roughly 30,000 acres/year based on local experience.

Appendix H and the Fire/Fuels section contain more summaries and descriptions of anticipated prescribed burning. The amount of burning in lands suitable versus unsuitable for timber production are relatively similar across alternatives with a constrained budget scenario. In an unconstrained budget scenario, more burning is projected on lands unsuitable for timber production, because the model had funds available to target areas where burning can best help meet desired conditions.

#### *Desired condition departure score*

The desired condition departure score from PRISM provides a comparison of how well alternatives move towards desired conditions. The desired conditions for vegetation were a component in the PRISM model formulation to ensure that projected harvest types and volumes would be consistent with plan components for terrestrial vegetation. Figure 48 displays the total departure score for each alternative over 5 decades. A lower score means that vegetation conditions were closer to the desired condition. In a constrained budget scenario, alternatives A, B/C, and D would be the best at moving the forest toward the desired condition, followed closely by F. Alternative E incurs the most penalty points, indicating it does not achieve the desired conditions as well as the other alternatives. In an unconstrained budget scenario, the alternatives were more similar to one another, with alternative E having the lowest (best) departure score followed by preferred alternative F, and alternative A having the highest (worst).



**Figure 48. Departure score over 5 decades by alternative, with and without budget constraint**

These results do not include dynamic interactions between treatments and ecological processes over time. Therefore, this metric is an indicator of the relative ability of each timber scenario to move towards desired condition but does not indicate the expected array of vegetation conditions over time. To accomplish this, the PRISM results were incorporated into the SIMPPLLE model. Refer to the terrestrial vegetation specialist section for an analysis of alternative relative to vegetation conditions over time.

**Other forest products**

Commercial use of other forest products is not allowed in designated wilderness, RWAs, wilderness study areas, research natural areas, or the Tenderfoot Creek Experimental Forest. The differences between alternatives is driven by RWAs. Table 263 displays the acres by alternative where commercial use of special forest products is not suitable. Commercial use of special forest products is suitable to the greatest degree in Alternative E, and to the least in Alternative D.

**Table 263. Acres where commercial use of special forest products is not suitable by alternative**

Alternative A	Alternative B/C	Alternative D	Alternative E	Alternative F
787,058	874,967	1,082,141	752,879	843,783

**Effects from forest plan components used to define “management area groups” in PRISM**

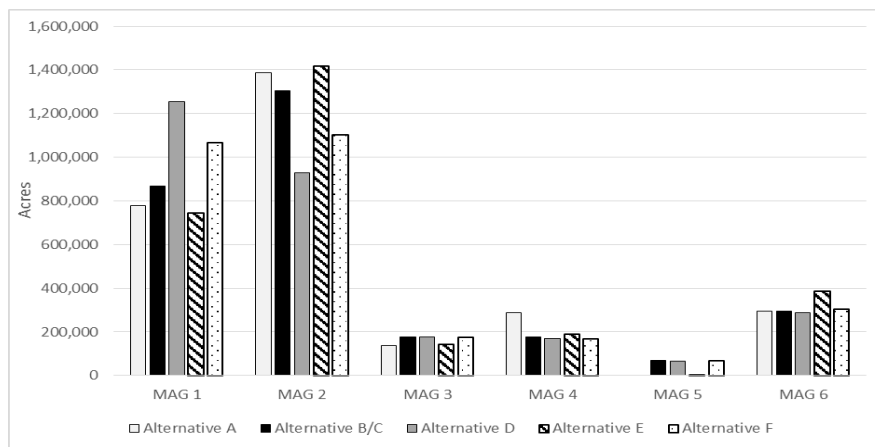
One of the primary model calibrations in PRISM was to generate harvest limitations based on land allocations. To do this, “management area groups” were developed that incorporate relevant designated areas, suitability for timber production and harvest, RMZs, and ROS settings as an indicator of access and feasibility. Constraints were designed to represent the plan components for these areas that would influence timber harvest (Table 264 and Figure 49).

**Table 264. Management area groups and associated harvest constraints (PRISM)**

MAG	Areas included (hierarchical)	Summary	Model constraint
1	Wilderness, RWAs, WSAs, RNAs, or ROS = primitive	Generally no harvest <sup>1</sup> allowed.	Prescribed burning only. No harvest.
2	IRA, or ROS = semiprimitive nonmotorized	Harvest allowed (very low)	0-5% of planned harvest
3	RMZ, or ROS = semiprimitive motorized	Harvest allowed (low)	1-10% of the planned harvest
4	All other lands unsuitable for production	Harvest allowed (moderate)	No more than 25% of planned harvest

MAG	Areas included (hierarchical)	Summary	Model constraint
5	ROS = semiprimitive nonmotorized, suitable for production	Harvest allowed (mod/high)	At least 65% of planned harvest
6	All else in lands suitable for production	Harvest allowed (high). ROS is permissive	

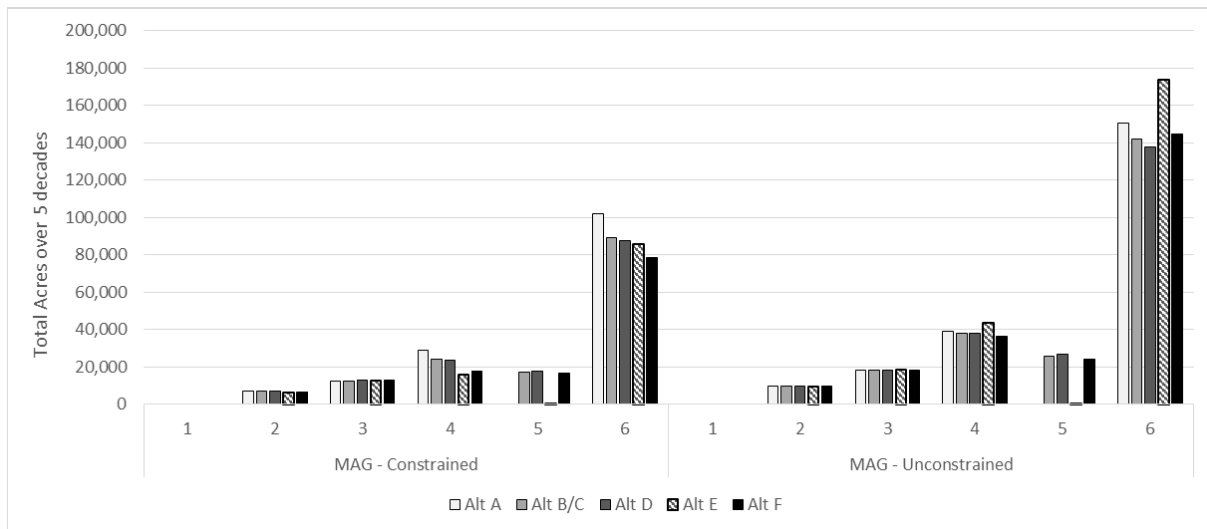
<sup>1</sup> Harvest is not prohibited in RNAs or primitive ROS settings; however, it is expected to be minimal and rare, and therefore for modeling purposes it was assumed that no harvest would occur.



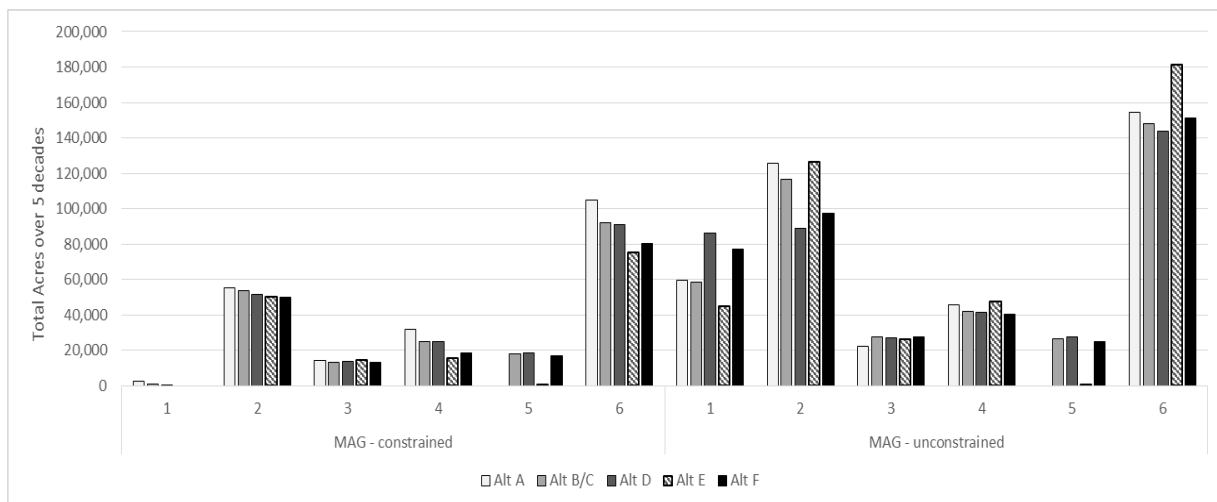
**Figure 49. PRISM management area groups by alternative**

The sensitivity analysis (appendix H) shows that the factors incorporated into management area groups are highly influential to the timber schedule and volume projections. The constraints assigned to management area groups reduced the attainment of desired condition by 39%; reduced projected timber sale quantity by 19%; reduced harvest acres by 16%; reduced prescribed burning acres by 35%; and increased the budget used by 15%. Because of their large acreages, the designations that prohibit or limit harvest (groups 1 and 2) are the primary drivers of these impacts.

Figure 50 displays the total harvest acres in 5 decades by management area group. Most of the harvest is scheduled in MAG 6, which represents lands suitable for timber production which have no constraints due to access; it is a relatively small landbase compared to management area groups 1 and 2. Without a constrained budget, more harvest is applied in management area group 4 in particular. The constraints in groups 1, 2, and 3 ensure that plan components for certain designated areas and RMZs are met. The total acres projected in group 2 averages to less than 150 acres per year, and less than 300 acres per year in group 3, in all alternatives. Figure 51 displays the total prescribed burning acres in 5 decades by management area group. Most of the burning is scheduled in groups 6 and 2. Without a constrained budget, more burning is applied in group 1 in particular.



**Figure 50. Total harvest acres projected by PRISM for 50 years, by management area group, with and without a constrained budget**



**Figure 51. Total prescribed burning acres projected by PRISM (in forested types) for 50 years, by management area group, with and without a constrained budget**

Each factor that was incorporated into management area groups for PRISM are detailed below.

**Recreation opportunity settings**

ROS settings are land allocations that influence future access and desired vegetation conditions, and therefore indirectly influence how much timber harvest can occur (FW-ROS-DC, FW-ROS-STD, FW-ROS-GDL, FW-ROS-SUIT). The existing 1986 Forest Plans (alternative A) did not include this system; but ROS settings were modeled to compare alternatives. ROS settings do not include suitability statements regarding timber production or harvest; rather, these settings were used as indicators of remoteness and access opportunities when the suitability layers were developed, and are used in PRISM to inform harvest constraints based on the following summary of plan components:

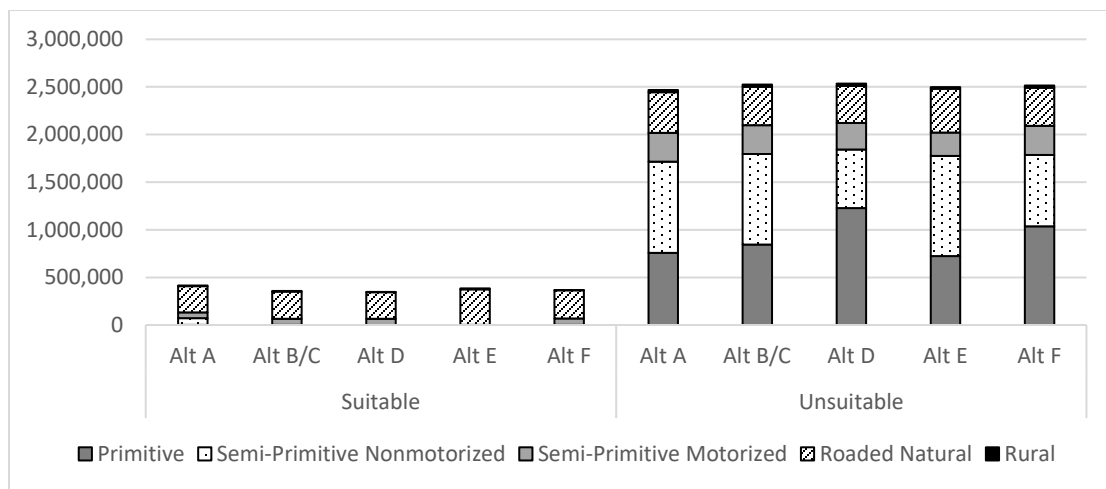
- *Primitive settings* are inaccessible and producing crops of timber is not compatible with desired conditions. Harvest would be suitable (unless prohibited by other land allocations) but would rarely occur because this setting often corresponds to designated wilderness and RWAs; and/or existing and potential



access is poor. Natural processes are the primary drivers of vegetation change. For modeling purposes it was assumed no harvest would occur.

- *Semiprimitive nonmotorized settings* are generally inaccessible, although harvest can occur to maintain natural vegetation. These areas are often but not always associated with IRAs, where limitations on harvest from the Roadless Area Conservation Rule apply. These areas typically have poor access and either natural processes or prescribed fire would be drivers of vegetation change. For modeling purposes, it was assumed that harvest would only occur at low levels in these areas.
- *Semiprimitive motorized settings* have varying levels of access, and harvest is generally allowed, although the plan specifies that vegetation management should create limited, widely dispersed treatment areas consistent with natural vegetation patterns. For modeling purposes, it was assumed that harvest would occur at low to moderate levels.
- *Roaded natural and rural settings* are often suitable for timber production, and harvest is generally allowed. Typically, there is good road access, and vegetation management may be evident while in harmony with the scenic character of the area. For modeling purposes, it was assumed that harvest would occur at moderate to high levels.

The acres allocated to summer ROS by alternative are shown in Figure 52. Alternative D is the most limiting to harvest because it has the most primitive settings. In all alternatives, the bulk of lands suitable for timber production have a roaded natural setting. However, alternatives A, B/C and D also have a substantial portion of suitable lands in semiprimitive motorized, whereas alternative E has little. Alternative E has the most acres of lands suitable for timber production, and those lands lie in the ROS settings most permissive to vegetation management.



**Figure 52. Acres of summer ROS by alternative, suitable versus unsuitable for timber production**

<sup>1</sup>Alternative C varies slightly from Alternative B in terms of recreation opportunity spectrum classes in unsuitable lands and are within a few hundred acres for all classes. These differences are negligible in the context of the timber analysis, and the relative amounts and trends are the same. The acres for suitable lands are the same.

**Inventoried roadless areas**

The establishment of IRAs limits harvest across a large portion of the HLC NF. The establishment of these areas is not within the scope of forest plan revision. Plan components in the action alternatives reflect the Roadless Area Conservation Rule. Although not included in the 1986 plans, this direction would also apply to alternative A. The limitations to harvest in these areas were incorporated into the timber modeling and had a substantial impact on the projected timber volume outputs.

IRAs are not suitable for timber production (FW-IRA-SUIT-01) and do not vary by alternative. Timber harvest is allowed but is limited under the Roadless Area Conservation Rule. RWAs tend to overlap with IRAs, and in those areas no harvest is allowed. Therefore, to the extent that RWAs vary by alternative, so too does the amount of IRAs where harvest may occur. Table 265 compares the IRAs where harvest may occur by alternative (that is, those that are not also RWAs or other designations where harvest is prohibited). Alternatives B/C and D have the least acreage in IRAs where harvest could occur. This is due to the most RWAs that overlaps these areas. Alternative E has the most IRAs that could potentially have harvest because it has no RWAs.

**Table 265. Lands where harvest may occur in IRAs by alternative**

	Alternative A	Alternative B/C	Alternative D	Alternative E	Alternative F
Acres	1,133,297	1,083,810	904,150	1,200,503	1,112,157
% of NFS lands	39%	38%	31%	42%	39%

In IRAs, the legal requirements of the 2001 Roadless Area Conservation rule would limit the purposes for which harvest could occur, and the types of prescriptions that could be applied. The possible purposes of harvesting “generally small diameter timber” would include improving at-risk species habitat or maintaining or restoring ecosystem composition and structure within the NRV. The effect of this direction would be to limit the acres of harvest and volume outputs that occur. Harvest in IRAs requires additional analysis and receives public and agency scrutiny. Management area group constraints as a whole had a substantial impact (limiting) the projected timber production and harvest; due to the large expanse and limitations applied to group 2, the impact of IRAs is one of the largest constraints to timber management on the HLC NF. Very little harvest is projected to occur in this group as part of the modeled solution to move the forest towards desired conditions (an average of less than 150 acres/year under all alternatives with a constrained budget, and less than 200 acres/year with an unconstrained budget).

**Recommended wilderness**

In all alternatives, no harvest is allowed in RWAs (e.g., FW-RECWILD-SUIT-04 for the action alternatives); these areas are included in management area group in PRISM, where no harvest is allowed, and therefore the effects of this restriction are included in projected timber metrics displayed throughout this report. The number and location of RWAs varies by alternative. This land designation and associated components have a relatively small impact on timber outputs, because RWAs tend to be located in IRAs, where harvest limitations found in the Roadless Area conservation rule would apply under all alternatives. Timber harvest would be limited by law regardless of whether or not they are recommended as wilderness. While some harvest could occur in IRAs, the amount harvested, and in particular the volumes removed from these areas would be relatively small, as shown in Figure 50.

The overlap of RWAs with lands where timber production could have been selected (those that *may be* suitable for timber production) reflects a more distinct tradeoff with the timber resource (Table 266). Alternative D has the most acres of RWAs that could have been suitable for timber production and represents the highest degree to which timber outputs may be foregone by RWA designations. Preferred alternative F has more RWAs than alternatives A and E, but less than alternatives B, C, and D; and only 1% of the RWA acres in that alternative would have been eligible for inclusion in lands suitable for timber production.

**Table 266. RWAs that could have been suitable for timber production by alternative<sup>1</sup>**

Alternative	Total RWA Acres	Acres of RWA that could have been suitable for timber production	Percent of RWA that could have been suitable for timber production
Alternative A	34,212	60	0.2
Alternative B/C	188,469	4,123	2

Alternative	Total RWA Acres	Acres of RWA that could have been suitable for timber production	Percent of RWA that could have been suitable for timber production
Alternative D	449,956	26,808	6
Alternative E	0	0	0
Alternative F	145,184	1,766	1

<sup>1</sup>: Lands that could have been suitable for timber production are those that are included in the lands that *may be suitable* for timber production layer.

Several RWAs represent specific tradeoffs with timber harvest because they are located in landscapes where the HLC NF has identified a need for active management. These include the Colorado Mountain and Camas RWAs which are included in alternative D only. If alternative D were selected, opportunities to utilize timber harvest (to the extent consistent with IRA and other plan components) would be precluded. This may reduce the ability to treat those landscapes in a manner that most efficiently, and to the greatest extent, moves them toward desired vegetation conditions and/or to meet the purpose and need of projects, including portions of the Tenmile Municipal Watershed within the Colorado Mountain RWA.

Under alternative C, existing motorized and mechanized uses would be suitable in RWAs, whereas these uses would be unsuitable in all other alternatives. This distinction would have little to no effect on timber metrics. The existing motorized uses are generally limited to motorized trails, as opposed to roads, and therefore these uses would cause negligible impacts to trees, and conversely provide little benefit in terms of access for harvest. The suitability for mechanized uses (e.g., mountain biking) would have little to no effect on the timber resource or the ability to conduct harvest.

### Designated wilderness, wilderness study areas, and research natural areas

Relative to the timber resource, the primary effect of plan components for WSAs and designated wilderness areas is to prohibit both timber production and timber harvest for any purpose. These designations are made by Congress and are out of the scope of forest plan revision. The timber model reflects this direction and does not allow for any harvest to occur (management area group 1). RNAs do not typically allow harvest (which is explicitly prohibited in the 1986 plans), but there may be rare instances where harvest could occur in the action alternatives (FW-RNA-SUIT-01). However, because no establishment records currently allow for harvest, for the purposes of analysis it was assumed no harvest would occur in these areas. The effect of the plan components for these designated areas (FW-WILD, FW-WSA, and FW-RNA) is to limit the amount of potential harvest on the HLC NF.

The collective limitation of these designated areas on timber harvest is relatively large due to the acres they represent (over 700,000 acres, which is more than the total of lands that may be suitable for timber production). Designated wilderness and WSAs are the same across all alternatives. Alternatives D and F contain a higher acreage of RNAs (21,375 and 18,447 acres respectively) than the other alternatives (16,870 acres) due to the addition of the proposed Poe-Manley RNA.

### Riparian management zones

Under alternative A, most of the HLC NF (east of the continental divide) would be directed by Montana streamside management zone laws and best management practices. Within these zones, no broadcast burning, clearcutting, or road construction would occur, and no ground-based equipment would be used. Various levels of green tree retention would be required depending on the type of stream present (Montana Department of Natural Resources and Conservation, 2006). Further, the 1986 Lewis and Clark forest plan included a riparian management area (R) that included a description of specific harvests (uneven-aged management) that could occur in riparian areas. Under this alternative, riparian areas west of the continental divide are delineated as riparian habitat conservation areas with restrictions applied based on the Inland Native Fish Strategy (U.S. Department of Agriculture, Forest Service, 1995a). This direction would apply to portions of the Divide GA and most of the Upper Blackfoot GA.

Under the action alternatives, RMZs would be established across the HLC NF. These zones are not suitable for timber production (FW-RMZ-SUIT-01). The width of the zones depends on the class of stream, and both inner and outer zones are defined (FW-RMZ-STD-01). Within these zones, vegetation management including harvest may occur (FW-RMZ-STD-02, 03). Limitations are more stringent in the inner zones, where management must benefit the aquatic resource. In the outer zones, vegetation management may achieve a wide range of desired conditions as long as it does not preclude achievement of desired conditions for riparian resources and wildlife in the inner zone. No salvage harvest could occur in the inner zone (FW-RMZ-STD-06), and no clearcutting should occur in any part of the RMZ (FW-RMZ-GDL-11). Other standards and guidelines related to landings and roads would also apply.

West of the continental divide, alternative A is similar to the action alternatives with respect to the sizes and management direction applied to riparian areas, although guidance for vegetation management in the outer zones is more flexible with the action alternatives. East of the continental divide (the majority of the HLC NF), the action alternatives would establish larger riparian zones than alternative A. The inner zones for many streams would be similar in width to streamside management zones under the no-action alternative. The outer zones would be larger, but flexibility to permit vegetation management is provided.

RMZs are mapped using the best available data at the programmatic scale for the purposes of analysis. Under all alternatives, RMZs were excluded from lands suitable for timber production because management requirements and constraints preclude planning a scheduled flow of timber products. However, harvest may occur when consistent with riparian plan components. Table 267 displays the estimated acres of RMZs in lands where harvest could occur for each alternative. To provide a consistent comparison, riparian areas for all alternatives are based on RMZ widths described in FW-RMZ-STD-01, as these widths represent the best available scientific information, and under alternative A similar management constraints would be considered. The limitations to harvest based on RMZs would impact 18 to 21% of lands where harvest can occur. However, if alternative A were selected, technically the RMZ definitions would not apply. West of the divide, INFISH riparian zones would apply; and east of the divide, riparian zones would be defined based on MT SMZ law. However, the most stringent harvest limitations would apply to the inner RMZs, which would not differ substantially from the size of streamside management zones in alternative A, and therefore the affect to management on the ground would be similar to the results shown below.

**Table 267. Lands (acres) where harvest may occur in RMZs**

<b>Alternative</b>	<b>A</b>	<b>B/C</b>	<b>D</b>	<b>E</b>	<b>F</b>
Total acres unsuitable for timber production, where harvest may occur	1,654,916	1,654,935	1,458,710	1,749,318	1,673,853
Riparian management zone acres in areas where harvest may occur	293,851	344,008	313,169	363,209	348,824
% of lands where harvest may occur in riparian management zones	18%	21%	21%	21%	21%

For the purposes of PRISM modeling, if they were not located within the more restrictive land allocations of management area groups 1 or 2, RMZs were placed into group 3, where expected harvest levels are low. This group also includes other semiprimitive nonmotorized lands. The limitations placed on this group resulted in the estimated level of harvest to be less than 275 acres per year under all alternatives with a constrained budget, and less than 375 acres per year with an unconstrained budget. Past harvest has not been common in the riparian zones. From 1940 to 2018, harvest occurred on about 14,461 acres of RMZs as they are mapped for the action alternatives, which is about 10% of the total harvest that occurred during that period, and less than 200 acres per year on average. Therefore, RMZ plan components are unlikely to constrain harvest to a greater degree than how these areas have been managed in the past.

*Effects from forest plan components associated with:***Watershed, Fisheries, and Conservation Watershed Network**

Watershed and fisheries plan components exist for all alternatives. These components would affect timber in that the scale and types of harvest would be influenced by the need to protect watershed function and water quality. This could result in limiting harvest in some cases, such as retaining forest cover to limit erosion; or increasing harvest, such as when vegetation modification is needed to limit the effects of potential high severity wildfire. The management direction in the action alternatives recognizes more flexibility in these scenarios than the no-action alternative. In all alternatives, plan components related to reducing sediment by limiting or reducing road access may limit access for harvest or reduce sale feasibility. Such limitations are more explicitly identified in the action alternatives than in the no-action alternative, but the effects to timber outputs would be similar for all alternatives.

Two specific types of watersheds have particular impacts to the timber resource: municipal watersheds and conservation watersheds. Neither type of watershed is explicitly included in PRISM; however, there is a constraint in the model that limits the amount of harvest that could occur in a single watershed to ensure an appropriate distribution of harvest.

*Municipal watersheds*

All alternatives include plan components related to maintaining the quality and quantity of water in municipal watersheds. These components could slightly limit harvest or reduce feasibility by informing the harvest treatment design and prescriptions, but not to the extent that it could be quantified with PRISM modeling. Table 268 shows the extent that municipal watersheds overlap with lands suitable for timber production, and other lands where harvest could occur; municipal watersheds affect only 2 to 3% of those land classifications depending on alternative.

**Table 268. Lands suitable for timber production and where harvest can occur in municipal watersheds**

	Lands suitable for timber production		Lands unsuitable for timber production where harvest can occur	
	Acres	% of total	Acres	% of total
Alternative A	8,714	2	42,156	3
Alternative B/C	9,875	3	39,920	2
Alternative D	9,874	3	28,379	2
Alternative E	11,951	3	38,927	2
Alternative F	9,875	3	40,064	2

Under all alternatives, management activities would be consistent with source water protections and goals. In Chapter 3, the Plan includes guidelines that address each municipal watershed area (Divide GA, Tenmile municipal watershed - DI-WTR-GDL; Elkhorns GA, McClellan Creek - EH-WTR-GDL-01; Little Belts GA, O'Brien and Willow Creek - LB-WTR-GDL-01; and Snowies GA, Big Spring Creek - SN-WTR-GDL-01). These components specify that treatments should emphasize restoration and resiliency. These components would not necessarily preclude timber production or harvest but would inform project design and may result in less intensive harvest in some cases. Generally, the action alternatives provide more flexibility for managing timber resources in municipal watersheds than the no-action alternative.

The no-action alternative also recognizes municipal watersheds with the exception of Big Spring Creek. The 1986 Helena Plan excluded portions of the Tenmile municipal watershed from lands suitable for timber production, and defined harvest considerations for the entire watershed (management areas H-1 and H-2). In contrast, the action alternatives include lands suitable for timber production in this municipal watershed. The 1986 Lewis and Clark NF Plan includes management area J, which includes the O'Brien and Willow Creek

municipal watersheds, provided for limited harvest in parts of O'Brien Creek but that harvest throughout these areas should only occur where necessary to control a hazard to water resources.

### *Conservation watersheds*

The action alternatives identify a CWN; this network is not identified in the no-action alternative but is included in the comparison of alternatives because a similar management emphasis could apply to alternative A. The purpose of this network is to enhance the conservation and recovery of aquatic species of concern. These areas should be the highest priority for restoration actions for the aquatic environment (FW-CWN-GDL-03), but there are no plan components that explicitly direct or limit timber harvest. Table 269 shows the extent of the overlap between these watersheds and lands suitable for timber production and other lands where harvest is permitted. Conservation watersheds overlap 5 to 6% of these lands. Other plan components related to watershed and aquatic resources could affect harvest as discussed in other sections, but plan components specific to conservation watersheds would not result in additional measurable effects. As such, constraints for these watersheds were not included in PRISM.

**Table 269. Lands suitable for timber production and where harvest could occur in conservation watersheds**

	Lands suitable for timber production		Lands unsuitable for timber production where harvest could occur	
	Acres	% of total	Acres	% of total
Alternative A	19,930	5	107,463	6
Alternative B/C	21,313	6	102,692	6
Alternative D	21,256	6	86,164	6
Alternative E	21,497	6	110,003	6
Alternative F	21,478	6	104,877	6

### *Fisheries and Aquatic Habitat*

Measures to protect aquatic habitat and riparian areas would apply under all alternatives. Refer to the *Watershed, Fisheries and Aquatic, Soil, Riparian, Conservation Watershed Networks and Wetlands* section, which discusses vegetation management in these areas. In general, the desired conditions, management restrictions, and other regulations that apply to areas near streams, water bodies, and wetlands would limit the amount of timber that may be produced; affect the types of harvest that occur; and/or may reduce operational feasibility of harvest. These potential limitations are captured in PRISM through consideration of RMZs.

### **Soils**

Under all alternatives, there are plan components related to maintaining soil productivity, which would benefit the timber resource by ensuring that potential growth is maintained in the long term. Standards and guidelines related to soils may limit timber production and harvest in some areas, to the extent that activities that may be detrimental to soils (such as repeated compaction, operating equipment on steep slopes, and the like) would be restricted. Such restrictions have been applied to recent timber management activities and continuing these practices would help sustain future timber production and would be generally the same for all alternatives.

The Plan includes more specificity than the no-action alternatives in some cases (e.g., FW-SOIL-STD-02 that specifies the percent detrimental soil disturbance allowed; FW-SOIL-GDL-01, specifies the maximum slope for ground-based equipment at 45%; and FW-SOIL-GDL-04 quantifies that 85% ground cover should be left after treatments). The 1986 Helena Plan addresses soil standards in a more general way, as does the 1986 Lewis and Clark Plan with the exception that it also specifies desired vegetation and litter cover on disturbed

areas (70%). The potential differences across alternatives in the effects to timber production and harvest would be likely small and unquantifiable.

### **Fire/fuels and air quality**

Plan components related to the management of natural disturbances and prescribed fire would have effects to timber. Wildland fire can affect the production of timber by killing and damaging trees. Conversely, it can also provide for thinning of the forest and, while economic loss may occur, can contribute to the long-term forest health and timber productivity depending on the site and severity of fire.

Under all alternatives, plan components allow for prescribed fire to occur across the landscape, as long as it is consistent with other plan components. Under all action alternatives, plan components associated with prescribed burning and other fuels management would complement timber management and vice versa, because treatments would be designed to move towards desired vegetation conditions. The plan components designed to limit fire hazard and risk (FW-FIRE-DC-01, FW-FIRE-DC-02, FW-FIRE-OBJ-01, and FW-FIRE-GDL-02) would influence harvest by emphasizing the need to dispose of slash material. Slash disposal and associated costs were included in the prescriptions in the PRISM model; the impact of these plan components was to reduce the potential amounts of harvest and burning in the constrained budget scenario. Plan components in the 1986 Forest Plans (alternative A) are more specific than the action alternatives in stating that prescribed burning on lands suitable for timber production would complement or enhance timber productivity.

Under all alternatives, plan components related to air quality could result in limitations to prescribed fire in order to meet air quality laws, and this could lessen the effects to the timber resource from prescribed fire (both positive and negative).

The SIMPPLLE model was used to predict the amount of wildfire based on the current fire suppression paradigm, as described in appendix H. The fire suppression assumptions are supported by plan components FW-FIRE-STD-01, FW-FIRE-GDL-02, and FW-FIRE-GDL-04. Under alternative A, plan components generally point toward priorities for fire suppression to protect other resources.

Rather than modelling the intricacies of fire suppression activities and strategies, the SIMPPLLE model was calibrated to represent the likely results of the current fire suppression paradigm by ensuring that the results (acres of fire) are similar to the results of recent fire occurrences. This level of fire was incorporated into PRISM. The effect of plan components related to fire suppression is varied and uncertain; in areas where fire is suppressed, the opportunity for timber output may have been protected. Where fires burn, there could be economic losses of timber, at least in the short term. However, in the long term, the result of some fires could be beneficial to timber to the extent that composition and structure are more resilient.

### **Terrestrial vegetation; and plant species at risk**

The action alternatives contain detailed desired conditions for terrestrial vegetation (FW-VEGT, FW-VEGF, FW-VEGNF, and FW-PLANT), and timber harvest is one of the tools available to help move the Forest toward those conditions. The 1986 plans include more broad, narrative descriptions of desired conditions over the planning period that are now outdated; however, in practice HLC NF could be managed in the spirit of the Plan desired conditions based upon the best available scientific information. Therefore, the same desired conditions are included in the modeling of all alternatives. The desired conditions for PRISM included the abundance of cover types, size, and density classes, in a manner consistent with FW-VEGT-DC-02, FW-VEGF-02, and 03. The most substantial desired shifts include an increase in ponderosa pine cover types, and an increase in large and very large size classes. The potential types, locations, and frequency of future harvest were influenced by these desired conditions, which were key assumptions underpinning the model. The influence of these components was to limit the projected timber outputs in some cases, because they indicate more expensive treatments or harvest in less productive types. This impact is demonstrated by the differences

between alternative E and the other alternatives, because alternative E was run with an objective to maximize timber production rather than attainment of desired conditions.

Under the action alternatives, FW-VEGT-OBJ-01 and FW-PLANT-OBJ-01 call for specific acres of vegetation treatments to occur, which could include harvest. FW-VEGT-GDL-02, 03, and 04 provide guidance for reforestation and reseeding practices, which will help ensure the prompt establishment of vegetation after harvest, and therefore contribute to the sustainability of the timber supply. The 1986 plans also include expected harvest levels as well as reforestation practices.

#### *Insects and Disease*

Under the no-action alternative, the 1986 plans viewed insects and disease from a “protection” standpoint, and included components related to harvesting areas at high risk of mountain pine beetle and controlling insects and disease with silvicultural and biological practices. In theory, this should result in greater protection of timber economic value and timber productivity, and potentially a higher level of timber outputs in the future; however, in practice, it has not been possible to harvest sufficient areas fast enough to alter the outcome of a large-scale mountain pine beetle outbreak such as the one experienced on the HLC NF in the late 2000’s. In contrast, the Plan under the action alternatives includes components that reflect a desire to allow native insects and diseases to affect vegetation at a scope and scale consistent with their natural endemic role (FW-VEGF-DC-09), while also recognizing the desire to promote vegetation conditions that result in tree mortality at the lower end of the NRV in areas where fire hazard or human safety is of concern (FW-VEGF-DC-10). Because harvest projects would be designed to move the forest towards the full array of desired conditions, they would also by default be contributing to these plan components. These components do not preclude potential harvest actions taken in landscapes at high risk of infestations. The insect and disease components under the no-action alternative would be more supportive of capturing timber value in anticipation or response to insect outbreaks; but in practice the net result would not likely be substantially different than the plan components in the action alternatives.

#### *Old growth*

In the no-action alternative, the 1986 plans quantify a desired level of old growth at a given scale (third order drainage on the Helena NF; and timber compartment on the Lewis and Clark NF), and allow for removal of old growth in excess of that amount. In contrast, the action alternatives include components that point to a desire to increase the amount of old growth on the landscape (FW-VEGF-DC-05), and would not allow for the removal of old growth except in very limited circumstances (FW-VEGF-GDL-04). However, the action alternatives also allow for harvest within old growth stands for certain purposes, as long as old growth characteristics are maintained (FW-VEGF-GDL-04). A comparison of the impacts to timber production and harvest across alternatives is uncertain and would vary based on site specific circumstances. For example, in some areas, the 1986 plans may allow for more harvest and economic return in areas where there is abundant old growth in excess of the minimum amounts, whereas in similar areas the action alternatives would constrain harvest in all old growth stands. Conversely, the 1986 plans would not allow harvest within the old growth designated to meet the minimum amounts, whereas the action alternatives may allow some harvest to thin and promote the resilience of those forests. Because the models used do not have the ability to identify old growth through time, no constraints were explored related to these plan components.

#### *Snags and woody debris*

Under the action alternatives, snag plan components (FW-VEGF-DC-06 and FW-VEGF-GDL-02) quantify the desired levels of these attributes and guide the retention of them during harvest treatments. Under the no-action alternative, the 1986 plans also include specific numbers of snag retention in harvest units, using different considerations for scale, size, distribution, and species. General levels of snag retention were included in the prescriptions used to build the yield tables for PRISM modeling, although it was not possible to approximate the plan components exactly. In all alternatives, the requirement to retain snags would result in only very



minor (immeasurable) reductions in the potential timber volume outputs from a treated stand and would have no effect on the acres harvested.

Under the action alternatives, coarse woody debris plan components (FW-VEGF-DC-07 and FW-VEGF-GDL-05) plan components quantify the desired levels of these attributes and guide the retention of them during harvest treatments. The 1986 plans do not address downed wood quantitatively; however, coarse wood retention would be guided by other regulatory framework under the no-action alternative. Specifically, the R1 supplement to the soils manual (FSM-2550, 2554.1(2)) points to the use of guidelines in Graham et al. 1994 for coarse woody debris. This publication is also used as the basis for FW-VEGF-GDL-05, and therefore in practice similar minimum amounts of coarse woody debris would be left under alternative A. These plan components would inform site-specific prescriptions and slash disposal methods, which are accounted for in the costs within PRISM, but not materially affect timber harvest or volume outputs.

#### *Landscape pattern*

The 1986 Forest Plans did little to address landscape pattern, other than to ensure the maximum size of regeneration harvest openings were 40 acres or less. In contrast, action alternatives include plan component FW-VEGF-DC-08, which discusses the natural range of patch sizes across the landscape and supports the timber component FW-TIM-STD-08 which provides for openings up to 75 acres. The action alternatives may therefore support slightly higher harvest acres and timber volume in some project areas.

#### **Invasive Plants**

There are plan components under all alternatives that address the desire to control and reduce invasive plants. While the specifics of these components vary across alternatives, with respect to the timber resource, the effects would be generally the same across alternatives, in that limiting the spread of weeds is a need and cost associated with timber harvest activities. These activities and costs are accounted for in PRISM, and their overall effect may be to lessen the amount of harvest that is done (to an unknown degree) in the constrained budget scenario.

#### **Wildlife habitat management**

In all alternatives, wildlife habitat plan components place limitations on harvest, including retention of certain habitat conditions as well as timing restrictions during sensitive time periods. Such considerations would be factored in during site-specific project design and would be key elements of project development but are not expected to alter timber output estimates at the programmatic level because there is flexibility at the broad scale in regard to project and treatment unit placement, design, and prescriptions.

#### *Big game and general wildlife plan components*

Under all alternatives, the management of big game species would limit the location, timing and duration of vegetation management, including harvest, and in some cases lower the amount of harvest because of certain required vegetation conditions. These plan components vary by alternative, as described in detail in the terrestrial vegetation section.

The components for big game are most relevant to the timber resource. Plan components related to elk specifically are included in alternative A. Under alternatives B, E, and F, FW-FWL-GDL-01 is general to all big game and could also limit harvest; this component is not included in alternatives C or D. The potential constraints to timber harvest in alternatives B, E, and F would be based on site-specific information and the best available scientific information. These plan components would be more flexible than those in alternative A. The impact of this would vary depending on the landscape; in some areas, biologists may determine that different amounts of certain habitat conditions would be needed than what is specified in alternative A plan components. Collectively, the potential effect of big game components on timber production and harvest cannot be quantified. With the action alternatives, by designing timber projects to move the forest toward the array of desired vegetation conditions, the coarse filter of necessary habitat needs would be implied, and any

site-specific project level adjustments to address big game plan components would not materially change timber estimates made at the programmatic level.

#### *Grizzly bear habitat management*

The HLC NF has incorporated the “Forest Plan Amendments to Incorporate Habitat Management Direction for the Northern Continental Divide Ecosystem Grizzly Bear Population” into the 1986 Helena NF and Lewis and Clark NF plans (Grizzly Bear Amendments). Management direction in the Grizzly Bear Amendment has been retained in the Plan. Management for grizzly bears may affect to a small degree the amount of timber removed, as an indirect result of limits on road access and duration of activities (Z1-NCDE-STD-01). These restrictions would apply to the primary conservation area and to Zone 1. The amount of land suitable for timber production within grizzly bear habitat, and the projected amounts of harvest in these areas, varies by alternative.

On the HLC NF, the primary conservation area occurs on portions of the Upper Blackfoot and Rocky Mountain Range GAs, and Zone 1 occurs on a portion of the Upper Blackfoot GA. Table 270 shows how much land suitable for timber production overlaps with these areas; most of these acres occur in the Upper Blackfoot GA because the Rocky Mountain Range contains no lands suitable for timber production. The remainder of the primary conservation area is in IRAs, wilderness, or other lands unsuitable for timber production. The area where potential harvest would be restricted represents a very small proportion of land suitable for timber production.

**Table 270. Lands suitable for timber production in the grizzly bear primary conservation area (PCA)**

<b>Alternative</b>	<b>Within PCA</b>	<b>% of lands suitable for timber production</b>
A	16,275	5
B/C	10,666	3
D	10,666	3
E	11,228	3
F	11,087	3

The general effect would be to lower the feasibility of some timber projects in the Upper Blackfoot GA. The timing restrictions would not have an impact on required reforestation or prescribed burning (PCA-NCDE-GDL-01). Due to the limited influence that habitat management for grizzly bears would have on timber management at the programmatic level, no constraints were applied in the PRISM model. Even without such constraints, the model only projected 5-23 average acres/year of harvest or a total of 200-1,200 acres (depending on alternative) during the entire 50-year modeling period in grizzly bear primary conservation area, with or without a constrained budget. Therefore, due to other restrictions and limited harvest opportunities in these areas, grizzly bear habitat plan components would have only a very small potential to impact timber harvest activities and outputs.

Grizzly bear habitat management may influence other special forest products, but to a very minor degree. While limiting road access may inhibit firewood gathering, components allow for the temporary use of access roads in projects to be used for such activities. Special considerations would apply for special use permits for beehives to limit grizzly-human conflicts; this use does not currently occur on the HLC NF. Finally, projects that increase food for grizzlies (i.e., berries) would avoid locations such as recreation areas.

#### *Canada lynx habitat management*

All alternatives would retain the Northern Rockies Lynx Management Direction (NRLMD) (U.S. Department of Agriculture, Forest Service, 2007b) . This direction would influence timber activities; this effect varies slightly by alternatives based on the overlap of potential lynx habitat with lands identified as suitable for timber production and where harvest can occur. The components that would influence timber production and harvest in these areas includes not allowing harvest in multi-storied forest except in specified situations (VEG

S6); limiting the extent of regeneration harvest depending on how much stand initiation habitat is present in a given lynx analysis unit (VEG S1, S2); and not allowing precommercial thinning in stand initiation habitat outside the WUI (VEG S5). The lynx management direction also notes the potential for vegetation management that would help develop desired habitat characteristics. This could influence the type of harvest conducted in some areas but is not explicitly captured in the modeling.

Although the management constraints are only required in occupied lynx habitat, the NRLMD specifies that its guidance should be considered on unoccupied lands as well. Currently, the Upper Blackfoot, Divide, and Rocky Mountain Range GAs are occupied. Because the guidance would be considered on all lands, and there is potential for occupancy to change, this analysis applied the NRLMD across the entire HLC NF for forest planning purposes. Table 271 compares the lands suitable for timber production and the proportion of those lands that are in potential lynx habitat by alternative. The magnitude of the influence of lynx plan components in lands suitable for timber production would be similar across alternatives; potential lynx habitat would apply on roughly half of these lands.

**Table 271. Lands suitable for timber production within potential lynx habitat (acres)**

Alternative	Acres of land suitable for timber production in potential lynx habitat	Percent of land suitable for timber production in potential lynx habitat
A	227,271	55
B/C	188,042	53
D	182,492	52
E	193,144	50
F	189,433	51

Harvest constraints based on the NRLMD were applied in PRISM as described in appendix H. These constraints included limiting the percent of areas that can have a regenerating harvest or prescribed burn, not allowing precommercial thinning in certain vegetation types, and not allowing treatment in mature multistoried habitat. However, these constraints had a relatively small impact on timber outputs. The sensitivity analysis for PRISM indicates that management constraints for lynx caused a 1.36% reduction in projected wood sale quantity and 3.42% reduction in harvest acres. Using these constraints, the model scheduled 900 -1,500 average acres/year of harvest in potential lynx habitat with a constrained budget (which equates to a total of 3-5% of potential lynx habitat harvested over 50 years) and 1,600-1,800 average acres/year with an unconstrained budget (5 to 6% of potential lynx habitat over 50 years), with slight variance across alternatives. Therefore, the constraints based on NRMLD would not substantially limit the potential to conduct harvest overall, indicating that the plan components related to timber and Canada lynx would not be mutually exclusive at the broad scale.

There has been a small technical change to the HLC NF potential lynx habitat layer that occurred after the completion of the modeling, which resulted in 15,931 acres of additional potential lynx habitat in the Big Belts. These areas were not subject to lynx constraints in PRISM. 76% of these areas occur in management area groups 1 and 2, however, where little treatment would have been applied regardless of lynx constraints. About 17% (less than 3,000 acres) are in lands suitable for timber production, where the lack of lynx constraints has the greatest potential to affect model results. This discrepancy would not likely cause a measurable affect to projected timber metrics.

### **Recreation opportunities and recreation special uses**

Plan components found in the recreation and recreation special uses section of the plan under the action alternatives (FW-REC-GDL-02, FW-REC-SUIT-01, FW-RSUP-DC-05) would ensure that potential timber harvest in recreation sites is done to meet scenic, public safety, and other resource objectives. The effect of

these components with respect to the timber resource would not be substantially different from the overall effect of the no-action alternative, which addressed recreation sites under management areas H (Lewis and Clark NF 1986 Plan) and R-2 (Helena NF 1986 Plan). These plans emphasize maintaining recreation values, safety, and healthy vegetation when harvesting timber and other forest products in these areas. The impact of these components to the timber resource would be negligible and be captured in site-specific project design in these areas (such as campgrounds).

### Scenery

For the action alternatives, plan components related to scenery (such as FW-SCENERY-GDL-01) influence the design and how much timber harvest would likely to occur. SIOs are consistent with plan components for the designated areas and ROS classes used to develop management area groups in PRISM, and therefore are inherently reflected in timber projections. SIOs of Very High and High are applied to a substantial portion of lands unsuitable for timber production, which is largely a result of wilderness, RWA, and IRA designations. Table 272 shows the distribution of SIOS on lands suitable for timber production in the action alternatives. Alternatives E and F have the most acres with a “low” SIO in lands suitable for timber production, which would be most permissive to logging activities.

**Table 272. Scenic integrity objectives in lands suitable for timber production - action alternatives**

	Very High	High	Moderate	Low
Alternative B	0	86,385	189,556	88,900
Alternative C	0	78,200	189,542	88,891
Alternative D	0	74,965	185,680	87,940
Alternative E	0	85,158	164,316	134,726
Alternative F	0	78,641	193,319	96,855

The effect of the SIOs in the action alternatives is summarized as follows:

- Harvest would be largely precluded in areas with a very high SIO, where the valued landscape character should be intact and allow for ecological change only. In some cases, harvest is prohibited by plan components for designated areas. Very high SIOs mainly correspond to wilderness, RWAs, WSAs, and RNAs.
- Areas with a high SIO primarily correspond to IRAs, wild and scenic river corridors, the King’s Hill Scenic Byway corridor, and the Continental Divide National Scenic Trail corridor. Timber production and/or harvest may be allowed (unless precluded by other land allocations), but scenery (and other limitations) would result in low to moderate levels. Landscape character must appear intact, and management activities would not dominate the landscape.
- Areas with a moderate or low SIO are often suitable for timber production and/or harvest. “Moderate” landscapes may appear slightly altered although management activities remain visually subordinate to the overall landscape character. “Low” areas may appear altered, and management activities are visible. These SIOs would not materially constrain timber harvest.

The existing 1986 Forest Plans (alternative A) do not include SIOs. However, visual quality objectives (U.S. Department of Agriculture, Forest Service, 1974) were specified by management area (Table 273).

**Table 273. Visual quality objectives for alternative A (acres)**

Visual quality objective	Lands suitable for timber production	Lands unsuitable for timber production
Preservation	1	598,473

Visual quality objective	Lands suitable for timber production	Lands unsuitable for timber production
Retention	40,217	224,993
Partial Retention	121,283	526,454
Modification	268,987	1,103,300

- In areas with a preservation visual quality objective, only ecological changes are allowed; no timber harvest would occur. Primarily wilderness and RWAs have this objective. The 1-acre inclusion in Table 273 is a result of the sum of small mapping discrepancies.
- A retention visual quality objective allows for management activities which are not visually evident. While some harvest could be allowed, these lands are generally not suitable for timber production, and may correspond to designations such as IRAs.
- A partial retention visual quality objective indicates that management activities must remain visually subordinate to the characteristic landscape. Some of these lands are suitable for timber production, and harvest on unsuitable lands may occur, although the type and rate of harvest would likely be less than lands with a modification or maximum modification objective.
- With a modification visual quality objective, management activities such as timber harvest may visually dominate the original characteristic landscape. This is the most common visual quality objective on the HLC NF, for both lands suitable and unsuitable for timber production.

Under all alternatives, additional site-specific scenery requirements (such as sensitive viewsheds) would influence project design and therefore potentially the amount, type, and/or location of harvest activities. These factors may reduce timber harvest to a small degree in specific areas but would not substantially impact the estimates made with PRISM.

**Eligible Wild and Scenic Rivers**

Eligible wild and scenic river (WSR) corridors are identified for all alternatives, at a width of ¼ mile of each side of the stream. All action alternatives include the same WSRs, whereas the no-action alternative includes fewer. To be consistent with interim protection measures these corridors would be unsuitable for timber production, but some harvest could occur depending on the other land allocations that apply. For example, many of these river segments pass through lands where harvest would not be allowed due to other land designations (such as wilderness). Where harvest could be allowed, the constraints on harvest would vary slightly based on the type of river (wild, scenic, or recreational); however, in all cases, harvest would not be expected to be common. The interim protection measures would limit harvest for purposes such as public safety and protection of outstanding remarkable values.

Wild and scenic river corridors in the no-action alternative constrain harvest on fewer acres than the action alternatives (Table 274); the amount of acreage affected varies by alternative based on the differences in land allocations where harvest may occur. Constraints immediately adjacent to the WSRs would be broadly represented by RMZ constraints in PRISM. Constraints for width of the corridors outside of RMZs are not represented in the modeling; however, given the limited number of acres where harvest would be possible, these constraints would not substantially impact the harvest or volume outputs.

**Table 274. Acres of land unsuitable for timber production where harvest may occur, within wild and scenic river corridors**

Alternative	Acres	% of total land where harvest may occur
A	10,608	<1
B/C	55,777	3
D	48,864	3

Alternative	Acres	% of total land where harvest may occur
E	62,125	4
F	56,849	3

**National Recreation Trails; Lewis and Clark National Historic Trail**

FW-NRT-GDL-01 specifies that management activities along national recreation trails should maintain or enhance the valued attributes for which the trails were established. FW-LCNHT-GDL-02 similarly requires that vegetation management would only occur when consistent with the values of this trail, within ¼ mile of the trail. Portions of these trails run through lands where harvest would be precluded by other land allocations, while small segments pass through lands suitable for timber production or where harvest could occur for other multiple use purposes. While these components may inform project design in these areas and limit the type or intensity of harvest, they would not materially affect the timber resource or opportunities for harvest and volume outputs at the forestwide scale. These trails are not addressed as specifically in alternative A plan components, although similar considerations would likely be applied as in the action alternatives.

**Continental Divide National Scenic Trail**

The Continental Divide National Scenic Trail runs through the HLC NF planning area in the Divide, Upper Blackfoot, and Rocky Mountain Range GAs. Many stretches of this trail are in designated wilderness, where timber harvest is prohibited; or, in IRAs, where timber harvest is constrained. However, some segments are located in other areas where harvest could occur, including areas that are suitable for timber production. Under the no-action alternative, the 1986 plan components for the Continental Divide National Scenic Trail point to the comprehensive management plan for the trail and emphasizes visual quality. Under the action alternatives, harvest would be constrained by plan components associated with the trail, which are designed to maintain a high or very high scenic integrity objective within ½ mile of either side of the trail (FW-CDNST-GDL-02, 03). Guidelines also limit harvest-related activities such as temporary roads, skidding, hauling, and log landings (FW-CDNST-GDL-08, 09).

The overlap of lands where harvest could be permitted within ½ mile of the Continental Divide National Scenic Trail is shown in Table 275. Alternative D would have the least amount of overlap with the trail corridor where harvest could occur, as a function of RWAs. Alternative A would have the most overlap with lands suitable for timber production, while alternative E would have the most overlap of unsuitable lands where harvest could occur. Where the corridor overlaps these areas, the types of harvest could be limited, and/or harvest projects may be more complex. However, the limitations of the trail plan components would not materially change timber estimates at the programmatic level because 1) some level of harvest could still occur; and 2) the total area of overlap represents very small percentages of lands suitable for timber production or unsuitable lands where harvest may occur (2 to 3% depending on alternative).

**Table 275. Overlap of the Continental Divide National Scenic Trail corridor with lands where harvest may occur**

Alternative	Lands suitable for timber production		Lands unsuitable for timber production where harvest may occur	
	Acres	% of total	Acres	% of total
A	11,697	3	55,563	3
B/C	8,934	3	49,187	3
D	8,184	2	47,027	3
E	10,197	3	59,828	3
F	8,935	2	49,437	3

### Livestock grazing

In all alternatives, livestock grazing would occur in lands suitable for timber production, and in unsuitable areas where harvest occurs for other multiple use purposes. The proportion of lands suitable for timber production and where harvest may occur for other purposes that are within current livestock allotments are shown in Table 276. Alternative E has the most lands where harvest could be impacted by the management of livestock because it has the most lands suitable for timber production and no RWAs. Under all alternatives, range allotments cover a fairly high proportion of lands suitable for timber production, and where harvest may occur for other purposes.

**Table 276. Percent lands where harvest can occur within livestock allotments**

Alternative	Percent of lands suitable for timber production in livestock allotments	Percent of lands unsuitable for timber production where harvest can occur in livestock allotments
Alternative A	69	57
Alternative B/C	67	59
Alternative D	67	60
Alternative E	67	56
Alternative F	68	58

Grazing and livestock trampling could present a risk to reforestation and cause compaction, and therefore could affect timber productivity. However, based on the guidance provided by plan components, these risks would be low and are not expected to measurably affect timber productivity. Management direction that addresses livestock grazing and timber harvest and production would have similar results across alternatives. Under the action alternatives, plan components would ensure that grazing is managed to avoid impacting the regeneration of forests impacted by harvest, fire, or other disturbances (FW-VEGT-GDL-02). Grazing would be managed in a manner that complements the desired condition of forested vegetation (FW-GRAZ-GDL-02) and therefore should not lower site productivity or preclude the production of timber or other forest products. Under the no-action alternative, the HNF and LCNF 1986 plans include forestwide standards to use best management practices to minimize livestock damage and protect soils, but do not specifically address reforestation. Therefore, potential negative effects from grazing to reforestation and future timber productivity would be slightly less with the action alternatives.

### Carbon sequestration

Under the action alternatives, FW-CARB-DC-01 complements the suite of vegetation and timber plan components by emphasizing a desire to sustain carbon storage and sequestration, which is a function of maintaining healthy vegetation communities. It specifically notes a desire for forests that are resilient to disturbances. This component would not directly limit potential timber harvest opportunities or volume outputs, because the PRISM modeling takes into account desired vegetation conditions and provides for sustainability of forests. Carbon sequestration is a focus of public interest, particularly as it relates to whether harvest has a net positive or negative impact; this is addressed and analyzed in the *carbon sequestration and climate change* section. The 1986 plans (no-action alternative) do not contain plan components related to carbon sequestration and therefore have no potential to influence timber harvest or production related to that ecosystem function.

### The Missouri River Corridor and Smith River Corridor

The Missouri River Corridor and the Smith River Corridor are included in all action alternatives, but not the no-action alternative. These areas would be unsuitable for timber production (BB-MISCOR-SUIT-01, LB-SMITH-SUIT-01), although harvest may occur to provide public safety and enhance the recreational or aesthetic values of the corridor. These areas were excluded from the lands suitable for timber production under

all action alternatives but included in lands where harvest may occur unless otherwise limited by other overlapping land designations. This suitability was incorporated in PRISM via management area group. There was little land in this area that could be considered for timber suitability, based on other land designations and technical factors, and therefore it is not substantially different from the no-action alternative. The inclusion of these emphasis areas in the action alternatives would have very little impact on timber production or harvest.

### **The South Hills Special Recreation Area**

The South Hills Special Recreation Area is in the Divide GA and is included in alternatives B, C, D, and F. In these alternatives, this area would be unsuitable for timber production but timber harvest for other purposes is emphasized (DI-SHRA-GDL-01, DI-SHRA-SUIT-01). In Alternatives A and E, this special area is not identified; some of the lands within the area would be suitable for timber production as determined by other land designations and technical factors. The potential for timber suitability and harvest was reflected for each alternative in PRISM based on the management area groups. It is not possible to infer from model results the exact impact of the plan components for this emphasis area, but because harvest is allowed regardless of timber suitability, it is not likely that its inclusion causes the timber production or harvest levels to decline much in alternatives B, C, D, and F as compared to A and E.

### **Showdown Ski Area and Teton Pass Ski Area**

Two ski areas are included in the action alternatives: Showdown (Little Belts GA), and Teton Pass (Rocky Mountain Range GA). These areas are included in management area H in the 1986 Lewis and Clark forest plan. The action alternatives include components that state these areas are unsuitable for timber production, but harvest may occur (LB-SHOWSKI-SUIT-01; RM-TETON-SUIT-01); and include specific desired conditions for vegetation (LB-SHOWSKI-DC-02; RM-TETON-DC-02). Related to these desired conditions, there are exceptions built into FW-VEGF-GDL-01 and FW-VEGF-GDL-02 to provide management flexibility and exceptions related to large tree and snag retention. The PRISM model reflects potential harvest in these areas based on the designation of lands suitable for timber production and management area groups related to the recreational opportunity spectrum settings and other designations (such as IRAs). There would be negligible impact of the plan components for these ski areas because harvest would be allowed, and the acreages affected are very small.

### **Tenderfoot Creek Experimental Forest**

The Tenderfoot Creek Experimental Forest is included in all alternatives. It is unsuitable for timber production but harvest may occur for research purposes (LB-TCEF-SUIT-01). It is also unsuitable for commercial and personal use of certain forest products (LB-TCEF-SUIT 02, 03). PRISM reflects potential harvest in these areas based on the designation of lands suitable for timber production and management area groups related to the ROS settings and other designations (such as IRAs). There would be negligible impact of the Plan components because harvest is allowed.

### **The Kings Hill Scenic Byway**

With the no-action alternative, the area around the scenic byway is included in management area A, which emphasizes high scenic values. The King's Hill Scenic Byway is designated as an emphasis area in the action alternatives. LB-KHSB-GDL-01 ensures that management activities (including timber harvest) adjacent to the byway are consistent with an SIO of high, as well as protects and enhances the historically relevant natural and cultural resources of the area. Portions of the byway runs through lands where harvest is precluded by other land allocations, while some segments pass through lands suitable for timber production or where harvest can occur for other multiple use purposes. LB-KHSB-GDL-01 would limit the type and amount of harvest that can occur adjacent to the highway. However, there would be negligible impact to timber outputs because the acreages affected are small.



### **The Badger-Two Medicine Area**

The Badger-Two Medicine Area is in the Rocky Mountain Range GA. The area would be unsuitable for timber production in the action alternatives, although timber harvest could be used when needed for habitat restoration, hazardous fuels reduction, and to support tribal treaty rights (RM-BTM-SUIT-01). In the 1986 Lewis and Clark NF Plan, the Badger-Two Medicine area included primarily management areas E, F, and G (winter range and undeveloped), with some H (recreation sites) and R (riparian areas). In all alternatives, across most of the area, harvest would be limited by IRA direction and harvest would be most likely to occur in the northernmost portion of the area. These considerations were incorporated into PRISM. The Plan components under any alternative would not likely measurably decrease the timber harvest or volume outputs, because harvest was allowed and/or constrained by IRA direction.

### **Rocky Mountain Front Conservation Management Areas**

This area, located in the Rocky Mountain Range GA, was signed into public law in 2014 and would therefore apply to all alternatives. Plan components in the action alternatives were drafted to meet the specifications of this law and are therefore the same across all alternatives. These areas would be unsuitable for timber production, although harvest would be allowed (RM-CMA-SUIT-01). The regulations placed in the law (16 USC 539) would limit timber harvest to occur near existing roads because no new or temporary roads could be constructed except immediately adjacent to certain existing roads. PRISM reflects potential harvest in these areas based on the designation of lands suitable for timber production and management area groups related to the ROS settings and other designations (such as IRAs), which are consistent with conservation management area guidance. Based on topography and other land designations in this area, the additional limitations placed on timber harvest with this designation would be negligible.

### **Green Timber Basin-Beaver Creek Emphasis Area**

This unique botanical area is included only in alternative F. Under this alternative, timber harvest may occur as long as it does not degrade from the botanical resources of the area. Suitability for timber production would be guided by other land designations in this area; it is entirely within an IRA and the Rocky Mountain Front Conservation Management Area. Therefore, the slight additional limitation placed on potential harvest in this area (protecting the botanical resources) would not materially impact potential harvest or volume outputs.

### **Grandview Recreation Area**

This area is included only in alternative F. It is unsuitable for timber production; a portion of the area (outside of the Big Snowies WSA) may be suitable for harvest conducted for other purposes (SN-GVRA-SUIT-01). This plan component would not result in effects to the timber resource or projected timber harvest and volumes as compared to the other land designations that apply (such as IRAs). Therefore, there would be no net effect to timber with this land designation in alternative F as compared to the other alternatives.

## **Cumulative Effects**

There are many factors that influence timber harvest. The demand for timber products, supply from other sources, laws, and regulations, budgets, and court decisions all affect the amount of timber that may be harvested. The effects that past activities have had on all of the components of forest vegetation (e.g., forest composition and structure, landscape pattern, etc.) are reflected in the current condition.

### ***Increasing human population***

A stressor that may increase in the future is increasing population locally and nationally, with resulting demands and pressures on public lands. Locally, at present populations are increasing in the counties on the west side of the planning area, but declining or stable in other areas (refer to the *Social and Economics* section). Where population increases, increased tensions between the demand for timber and changing societal desires related to the mix of other uses may occur. The sustainable use of other forest products may become increasingly vulnerable, requiring permitting and limitation of use.

**Management of adjacent lands**

Portions of the HLC NF adjoin other NFs, each having its own forest plan. The HLC NF is also intermixed with lands of other ownerships, including private lands, other federal lands, and state lands. Some GAs contain inholdings of such lands, while others are more un-fragmented. Harvesting or conversion of forests on adjacent lands would affect vegetation conditions at the landscape level. State law applies to all harvest activities regardless of ownership; therefore, basic resource protections would be consistent. However, harvest practices on other lands would not necessarily be conducted to meet the same desired conditions as those outlined in the Plan.

Some adjacent lands are subject to their own resource management plans. The cumulative effects of these plans in conjunction with the HLC NF 2021 Land Management Plan are summarized in Table 277, for those plans relevant to the timber resource.

**Table 277. Cumulative effects to timber from other resource management plans**

Resource plan	Summary of effects
Forest plans of adjacent national forests	The Flathead, Lolo, Beaverhead-Deerlodge, and Custer-Gallatin NFs are adjacent to the HLC NF and share boundaries on specific GAs (Rocky Mountain Range, Upper Blackfoot, Divide, Elkhorns, and Crazyes). The Flathead and Custer-Gallatin are in forest plan revision under the 2012 Planning Rule. The Beaverhead-Deerlodge NF is guided by a 2009 forest plan developed under the 1982 rule. The Lolo is guided by a 1986 forest plan. All of the forest plans contain plan direction that meets the requirements of the NFMA, such as limitations on harvest, reforestation practices, and maximum sized openings. Generally speaking, management of the timber resource is consistent across NFs due to law, regulation, and policy. The management of the specific areas that are adjacent would be complementary.
Montana State Forest Action Plan (2020)	This plan emphasizes the conservation of working landscapes and notes the importance of maintaining timber infrastructure to meet forest health goals. It includes strategies related to partnerships and collaboration and the importance of encouraging opportunities for forest product and biomass removal from federal lands. The plan includes an array of specific strategies related to timber, wood products, and local economies. The 2021 Land Management Plan is more programmatic in nature but is consistent with this plan and provides the opportunity for timber and forest product removal.
Bureau of Land Management resource management plans	The Butte, Missoula, and Lewistown field offices manage lands that are intermixed with the HLC NF. The Missoula area is currently in revision; the Lewistown plan was recently issued (2019). The Butte area is guided by a 2009 plan. At a broad scale, the themes of the plans are similar to the HLC NF; timber management would be generally conducted with similar results.
County growth policies	Many of the county growth plans associated with the HLC NF planning area emphasize an interest in promoting the use wood products from NFS lands, as an economic contribution and to enhance the sustainability of forest landscapes. This would indicate that timber demand would remain an important feature in the local communities under all alternatives.
County wildfire protection plans	Some county wildfire protection plans map and/or define the wildland urban interface. The HLC NF notes that these areas may be a focus for hazardous fuels reduction, and other plan components (such as Northern Rockies Lynx Management Direction) have guidance specific to these areas. Treatments, including harvest, may be emphasized in these areas more so than others.
2018 Blackfeet Wildland Fire Management Plan	The Blackfeet Wildland Fire Management Plan recognizes resource uses such as timber management. Specifically, within certain Resource Management Units, the management emphasis is on timber management and the Blackfeet plan stresses fire suppression to support economic values. Although the 2021 Land Management Plan does not stress the need for fire suppression in such areas, it does include a desired condition that mortality from natural disturbances such as wildfire are less in lands suitable for timber production than in lands not suitable for timber production. The Blackfeet plan also includes planned timber harvest as part of the fuel reduction

Resource plan	Summary of effects
	strategy. Therefore the 2021 Land Management Plan is consistent with the Blackfoot wildland fire management plan.
Bureau of Reclamation Canyon Ferry Resource Management and Shoreline Plans	There are minimal trees in these areas, and no timber product uses or associated management direction. However, there is also nothing in these plans that conflict with the management direction found in the 2021 Land Management Plan.
Montana's State Wildlife Action Plan	This plan notes timber uses in some communities/habitats of interest. It also includes actions related to educating the public and land managers about the high value of certain forest features such as snags, legacy trees, and burned forests. In some specific focal areas, the plan notes that incompatible timber harvest practices may be a threat. The habitat considerations presented in this plan are supported by the 2021 Land Management Plan components related both to wildlife and timber, including goals to work with partners such as MTFWP when planning timber activities.
Glacier NP General Management Plan	While this plan notes that logging near the park can influence the park, no logging or timber management is conducted in the park. There is nothing in the 2021 Land Management Plan with respect to timber management that would conflict with the Glacier management plan.
Montana NRCS Soil Health Strategy	The soil health strategy does not directly address timber or other forest products and is primarily focused on soils in agricultural lands. Soil productivity is integral in the growth of timber; however, this plan would have little to no cumulative effect to the timber and other forest products resources on the HLC NF. There is nothing in the 2021 Land Management Plan that contradicts the concepts in the soil strategy.
Montana Air National Guard Integrated Natural Resources Management Plan for Limestone Hills Training Area	This plan includes a goal of monitoring the health and trend of native vegetation, as well as promoting fire-resilient conditions. However, the management approaches focus on wildfire prevention/suppression rather than timber harvest. Little coniferous forest is present, and therefore relatively little opportunity for timber management. However, there is nothing in the 2021 Land Management Plan that conflicts with the management plan for the Limestone Hills Training Area.
City of Helena Montana Parks, Recreation and Open Space Plan (2010)	This plan is relevant to an area that lies adjacent to national forest system lands in the Divide GA, in proximity to the City of Helena. The plan emphasizes forest management for the purposes of resiliency to wildfire and insects. While relatively little forest products would be removed from City lands relative to NFS lands, the direction in this plan this would be generally complementary and additive to management on some HLC NFS lands, specifically the South Hills Special Recreation area (alternatives B, C, and D).

### *Timber Demand*

The demand for wood products allows for vegetation management and timber sales from the HLC NF. Maintaining enough milling infrastructure helps to ensure that there will be buyers, and thus competition and higher prices for HLC NF timber. If demand for wood products increases in response to economic expansion and greater demand for new construction, so too will demand for timber sales from the HLC NF. Alternatively, if mills close either due to an inability to obtain timber inputs or due to external macroeconomic factors such as economic recession, there may be less desire for HLC NF timber. A decrease in market demand for timber may reduce the amount of timber sold across each of the alternatives. Lower wood quantity may contribute to total public and private land timber supply chain elasticity, especially for mills isolated from other ownership and highly dependent on HLC NF forest ownership. However, if enough timber is collectively removed from markets, it would have the effect of increasing sawlog prices, holding other factors constant. If raw material input prices increase without a commensurate increase in finished product (e.g. lumber) prices, mill profits will decrease, which could lead to more mill closures and job losses in the wood products sector.

### Conclusions

Timber is an important ecosystem service provided by the HLC NF. Managing lands suitable for timber production can provide a sustainable supply of timber products, which is important for local communities and

other ecosystem benefits. Timber harvest, on both lands suitable and unsuitable for timber production, is a tool that can be used to achieve desired vegetation conditions.

Land allocations beyond the scope of forest plan revision (e.g. designated wilderness and IRAs), as well as natural disturbances and ecosystem processes, affect the timber resource to a great degree. Within the decision space of forest plan revision, the range of alternatives shows the potential to conduct harvest and produce timber volumes in a sustainable manner that matches or exceeds the levels that have been done in the past. Actual timber outputs would be influenced by factors outside of FS control and/or not measurable in the timber modeling, such as actual budgets received and appeals/litigation processes. Preferred alternative F provides timber outputs and harvest acres only slightly less than alternative E but does nearly as well at moving the forest toward desired conditions as alternatives A, B/C, and D.

All alternatives identify lands suitable for timber production and other lands where harvest can occur for other multiple use purposes. The difference across alternatives in this aspect is minor because the primary factors that influence these determinations do not vary, such as IRA designations and the inherent capability of the land. The primary difference is due to management emphasis of certain areas. There is not a substantial trade-off with RWAs and lands suitable for timber production, because most of RWAs are also within IRAs, and therefore withdrawn from timber production. In all alternatives, a substantial proportion of lands unsuitable for timber production where harvest may occur are in IRAs; harvest in these areas would be constrained by the 2001 Roadless Area Conservation Rule. Alternative A contains the most land suitable for timber production, followed by E and then F. Alternative E has the most acres of lands unsuitable for timber production where harvest may occur, followed by F.

Alternatives A, B/C, and D are similar with respect to timber outputs, acres harvested, and achievement of desired conditions. Alternative E produces higher timber outputs, although it harvests fewer acres and does less to achieve desired vegetation conditions. The greater timber outputs are achieved with alternative E because of a modeling emphasis to maximize timber production, which results in harvesting fewer acres more intensively, in the most productive vegetation types. Alternatives A, B/C, and D would do more to achieve desired conditions by harvesting more acres less intensively, in less productive vegetation types. Preferred alternative F provides a compromise between these scenarios.

Projected timber outputs are evaluated with and without a budget constraint. Both budget scenarios include resource constraints to be consistent with plan components and legal requirements. The budget unconstrained scenario represents the harvest levels that could be achievable within the regulatory and ecological capacity of the HLC NF. Both scenarios are reflected in FW-TIM-OBJ-01 and 02.

Alternative E has the potential to produce more timber and associated jobs than the other alternatives based on projected volume outputs, followed by alternative F. However, alternatives A, B/C, D, and F would harvest more acres than E, and therefore job opportunities that are related to the magnitude of area treated could be greater. The trend for timber demand is independent of alternatives, but alternatives may offer different supply chain flexibility to planning area firms. Other forest products would remain available to a similar degree in all alternatives, with commercial opportunities varying as a function of RWAs.

Future warm and dry climates, as well as disturbances, may pose risks to forests in terms of growth, mortality, and regeneration potential; such factors could affect timber outputs. While future declines in forest growth could occur, the magnitude and timing are uncertain and may or may not be evident within the life of the Plan.

Table 278 shows a summary of the timber indicators across alternatives.

**Table 278. Timber indicators comparison of alternatives**

Indicator	Greatest	→	→	Least	
Acres suitable for timber production	A	E	F	B/C	D
Acres unsuitable for timber production where harvest can occur	E	F	B/C	A	D
Acres unsuitable for timber production where harvest can occur, not within IRAs	B/C	F	D	E	A
Projected timber sale quantity (PTSQ) and wood sale quantity (PWSQ), with a budget constraint	E	F	ABCD		
Projected timber sale quantity (PTSQ) and wood sale quantity (PWSQ), without a budget constraint	E	BCF	D	A	
Movement toward desired conditions, with a budget constraint	ABCD	F	E		
Movement toward desired conditions, without a budget constraint	E	BCDF	A		
Timber demand	ABCDEF				
Acres harvested, with a budget constraint	BCD	F	E		
Acres harvested, without a budget constraint	E	BCF	D	A	
Area where commercial use of other forest products is allowed	E	A	F	BC	D

## 3.29 Geology, Minerals, and Energy

### 3.29.1 Introduction

Minerals management of NFS lands requires interagency coordination and co-operation. Although the FS is responsible for the management of surface resources of NFS lands, the BLM is primarily responsible for management of government-owned minerals. Since it is not possible to separate mineral operations from surface management, the agencies have developed cooperative procedures to accommodate their respective responsibilities.

The FS has a minerals management mission to encourage, facilitate, and administer the orderly exploration, development, and production of mineral and energy resources on NFS lands to help meet the present and future needs of the Nation. Existing Federal laws, regulations, and legal decisions guide much of how or if particular minerals and energy management actions should take place. The right of access for purposes of prospecting, locating, and mining is provided by statute. Such access must be in accordance with the rules and regulations of the FS. Plan components do not reiterate overarching Federal law, regulation, and policy that must be implemented. The energy and minerals plan components provide further clarity and specificity as to how or if particular minerals and energy management actions should take place. All mineral and energy management activities on NFS lands are required to meet applicable environmental protection measures as required by law, regulation, and policy.

There are three types of mineral and energy resources:

- Locatable minerals include commodities such as gold, silver, copper, zinc, nickel, lead, platinum and some nonmetallic minerals such as asbestos, gypsum, and gemstones. Lands that are open to location under the Mining Law of 1872 guarantee U.S. citizens the right to prospect and explore lands reserved from the public domain and open to mineral entry. The right of reasonable access for exploration and development of locatable mineral is guaranteed. The disposal of locatable minerals is nondiscretionary.
- Leasable minerals include commodities such as oil, gas, coal, geothermal, potassium, sodium phosphates, oil shale, sulfur, and solid leasable minerals on acquired lands. Areas of the Forest are open to leasable minerals exploration, development and production. A leasing decision will not be a part of this plan. The disposal of these leasable minerals is discretionary.

- Salable minerals include common varieties of sand, stone, gravel, cinders, clay, pumice and pumicite. The FS has the authority to dispose of these materials on public lands through a variety of methods. The disposal of these materials is discretionary.

Mineral encumbrances for subsurface mineral estates include both reserved and outstanding private mineral rights on acquired lands on the HLC NF, and oil and gas leases and mining claims under the 1872 Mining Law.

The reserved and outstanding mineral rights occur on acquired lands that are split estate, federal surface, and private subsurface. Reserved mineral rights are those that a private landowner kept when the property was sold to the United States. Reserved minerals are managed based on the Secretary of Agriculture's rules and regulations. Outstanding minerals are those minerals that were separated from the surface estate sometime in the past. Outstanding minerals are subject to state laws and conditions stated in the original deed conveying the minerals. In both of these cases, the Forest Service has little control over the access and mineral activities for these private mineral rights. There are approximately 56,700 acres of lands with privately owned mineral estates within the HLC NF.

### Analysis area and indicators

The analysis area is the NFS lands within the Forest. The key indicators for minerals are:

- Locatable minerals – acres unavailable for mineral entry (withdrawn from mineral entry);
- Leasable minerals – acres unavailable for leasing proposals if these areas were to become Congressionally designated and proposed no surface occupancy stipulation acreages;
- Salable minerals-acres unavailable for disposal of mineral materials; and
- Timing and access restrictions that could affect all mineral development.

### Changes between draft and final

There were over 60 comments received from the public that were related to geology, minerals and energy. Over half were specific to oil and gas drilling and several were related to mineral withdrawals.

Information that was not provided in the draft document includes the following two points:

- An oil and gas leasing decision is not included in this revision process. It is a separate decision and beyond the scope of this analysis. An Oil and Gas Environmental Impact Statement and Record of Decision (ROD) was released in 1998 for the Helena National Forest and for the Elkhorn Mountains portion of the Deerlodge National Forest. An Oil and Gas Environmental Impact Statement and Record of Decision was released in 1997 for the Lewis and Clark National Forest. Both of these decisions are still in place for the HLC NF but may be changed by subsequent new laws and legislation.
- A mineral withdrawal is a comprehensive and time-consuming process and it requires a great deal of administrative review, which could take several years of analysis and public engagement before reaching a final decision. A mineral withdrawal is beyond the scope of this analysis and will not be included in the Plan.

There were no prominent or substantial changes to Geology, Energy and Minerals section resultant from public comments or the development of Alternative F. However, there were minor editorial and technical changes to the Geology, Energy and Minerals section from input provided by the public comments.

### 3.29.2 Regulatory framework

**Clarke-McNary Act of June 7, 1924 (P.L. 68-270, 43 Stat. 653 as amended, 16 U.S.C. § 505 et seq.):** All lands to which title is accepted under section 7 of this act become NFS lands, subject to all laws applicable to the lands acquired under the Weeks Act of March 1, 1911.

**Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. 9605, as amended.****EM-2160-1, FS Guide to Comprehensive Environmental Response, Compensation, and Liability Act, January 1996**

**Energy Policy Act of 2005 (P.L. 109-58):** Directs federal agencies to undertake efforts to ensure energy efficiency; and the production of secure, affordable, and reliable domestic energy.

**Energy Security Act of June 30, 1980 (P.L. 96-294, 94 Stat. 611, 42 U.S.C. § 8855):** This act directs the Secretary of Agriculture to process applications for leases and permits to explore, drill, and develop resources on NFS lands, notwithstanding the current status of the forest LRMP.

**Executive Order 13211 issued May 18, 2001:** This executive order titled “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use” requires federal agencies to prepare and submit a Statement of Energy Effects to the Office of Management and Budget describing the effects of certain regulatory actions on energy supply distribution, or use.

**Executive Order 13212 issued May 18, 2001:** This executive order titled “Actions to Expedite Energy-Related Projects” requires federal agencies to take actions, to the extent consistent with applicable law, to expedite projects that will increase the production, transmission, or conservation of energy.

**Federal Coal Leasing Amendments Act of August 4, 1976 (90 Stat. 1083; 30 U.S.C. § 201 et seq.):** This act amended the Mineral Lands Leasing Act of February 25, 1920 (para. 3) by specifying that coal leases on NFS lands may be issued only after the consent of the Secretary of Agriculture and adherence to conditions the Secretary may prescribe. The act also provides that no lease shall be issued unless the lands involved in the lease have been included in a comprehensive forest land and resource management plan and the sale is compatible with the Plan. The act authorizes the issuance of a license to conduct exploration for coal.

**Federal Onshore Oil and Gas Leasing Reform Act of 1987 (30 U.S.C. § 181 et seq.):** This act expands the authority of the Secretary of Agriculture in the management of oil and gas resources on NFS lands. The BLM cannot issue leases for oil and gas on NFS lands over the objection of the FS. The FS must approve all surface disturbing activities on NFS lands before operations commence.

**Geothermal Steam Act of December 24, 1970 (P.L. 91-581, 84 Stat. 1566, 30 U.S.C. § 1001-1025):** This act provides the Secretary of the Interior the authority to lease NFS lands for geothermal steam development, subject to the consent and conditions the Secretary of Agriculture may prescribe.

**Mineral Leasing Act of February 25, 1920 (P.L. 66-146, 41 Stat. 437 as amended, 30 U.S.C. § 181 et seq.):** This act authorizes the Secretary of the Interior to issue leases for the disposal of certain minerals (coal, phosphate, sodium, potassium, oil, oil shale, gilsonite, and gas). The act applies to NFS lands reserved from the public domain, including lands received in exchange for timber or other public domain lands, and lands with minerals reserved under special authority.

**Mineral Leasing Act for Acquired Lands of August 7, 1947 (P.L. 80-382, 61 Stat. 913, as amended, 30 U.S.C. § 351 et seq.):** This act extends the provisions of the mineral leasing laws to federally owned mineral deposits on acquired NFS lands and requires the consent of the Secretary of Agriculture prior to leasing.

**Mineral Materials Act of July 31, 1947 (P.L. 80-291, 61 Stat. 681, as amended, 30 U.S.C. § 601 et seq.):** This act provides for the disposal of mineral materials on the public lands through bidding, negotiated contracts, and free use.

**Mineral Resources on Weeks Law Lands Act of March 4, 1917 (P.L. 64-390, 39 Stat. 1149, 16 U.S.C. § 520):** This act authorizes the Secretary of Agriculture to issue permits and leases for prospecting, developing, and utilizing hard-rock minerals on lands acquired under the authority of the act. This authority was later transferred to the Secretary of the Interior.

**Mining and Minerals Policy Act of December 31, 1970 (P.L. 91-631, 84 Stat.1876, 30 U.S.C. § 21a):** This act states that the continuing policy of the federal government is to foster and encourage private enterprise in the development of economically sound and stable domestic mining and minerals industries and the orderly and economic development of domestic mineral resources.

**Montana Wilderness Study Act (Public Law 95-150)**

**Multiple Use Mining Act of July 23, 1955 (P.L. 84-167, 69 Stat. 368, as amended, 30 U.S.C § 601 et seq.):** This act requires the disposal of common varieties of sand, stone, gravel, pumice, pumicite, and cinders under the provisions of the Materials Act of July 31, 1947, and gives to the Secretary of Agriculture the authority to dispose of these materials. It provides that rights under any mining claim located under mining laws are subject to the right of the U.S. to manage and dispose of surface resources.

**National Materials and Minerals Policy, Research and Development Act of October 2, 1980 (94 Stat. 2305; 30 U.S.C. §1601-1605):** This act restates congressional intent to promote policies that provide for an adequate and stable supply of materials while considering long-term needs, a healthy environment, and natural resource conservation. The act also requires the Secretary of the Interior to improve the availability and analysis of mineral data in federal land use decision making.

**Omnibus Public Land Management Act (16 U.S.C. 470aaa to 470aaa-11 (2009; “the Act”)**

**Omnibus Parks and Public Lands Management Act of 1996 (P.L. 104-333, 110 Stat. 4093, 16 U.S.C. § 497c):** This act automatically withdraws from all forms of appropriation under the mining laws and from disposition under all laws pertaining to mineral and geothermal leasing all lands located within the boundaries of ski area permits.

**Resource Conservation and Recovery Act Regulations, 40 CFR 260-270**

**Surface Mining Control and Reclamation Act of August 3, 1977 (P.L. 95-87, 91 Stat. 445, 30 U.S.C. § 1201-1328):** This act provides for cooperation between the Secretary of the Interior and states in the regulation of surface coal mining. It also restricts or prohibits surface coal mining operations on NFS lands, subject to valid existing rights and compatibility determinations.

**Tax Relief and Health Care Act of 2006, Public Law 109-432 Section 403(a)**

**The Reorganization Plan No. 3 of 1946 (60 Stat. 1097; 5 U.S.C. appendix):** This transferred the functions of the Secretary of Agriculture with respect to permits and leases for hard-rock minerals on acquired Weeks Law land to the Secretary of the Interior. However, Secretary of Agriculture Consent to the issuance of permits or leases is required.

**Weeks Law Act of March 1, 1911 (P.L. 61-435, 72 Stat. 1571, as amended, 16 U.S.C. § 480 et seq):** This act authorized the federal government to purchase lands for stream-flow protection and maintain the acquired lands as national forests.

**128 Stat. 3828 (P.L. 113–291—Dec. 19, 2014) SEC. 3063:** North Fork Federal Lands Withdrawal Area. “To withdraw certain Federal land and interests in that land from location, entry, and patent under the mining laws and disposition under the mineral and geothermal leasing laws and to preserve existing uses” (see figure B-53). Nothing in this section prohibits the Secretary of the Interior from taking any action necessary to complete any requirement under the NEPA of 1969 (42 U.S.C. 4321 et seq.) or the ESA of 1973 (16 U.S.C. 1531 et seq.) required for permitting surface-disturbing activity to occur on any lease issued before the date of enactment of this Act.

**36 CFR 228 — Minerals:** These regulations set forth rules and procedures governing use of the surface of NFS lands in conjunction with operations authorized by the general mining laws, oil and gas leasing, and mineral material disposal laws.



**36 CFR Part 251** — Land Uses; **Part 290**—Cave Resources Management; **36 CFR Part 291**—Paleontological Resources Preservation

**43 CFR 2300** — Land Withdrawals

**Executive Order 12580, signed January 29, 1987**

**7 CFR 2.60 Delegation of Lead Agency Authority to the Chief of the Forest Service**

**40 CFR 300 National Oil and Hazardous Substances Pollution Contingency Plan**

**29 CFR 1910.120 Occupational Safety and Health Administration**

### *Interagency agreements*

The FS has entered into interagency agreements with agencies within the U.S. Department of Interior to cooperate and coordinate in the management of federally owned minerals within NFS lands. The principal agreements include:

- November 8, 1946, agreement with the BLM detailing procedures for mineral leases and permits administered under section 402 of the President's Reorganization Plan No. 3 of 1946.
- May 18, 1957, memorandum of understanding with the BLM describing work procedures for land applications, mining claims, and patents.
- March 4, 1977, cooperative agreement with the U.S. Geological Survey concerning oil and gas operations.
- May 20, 1980, agreement with the BLM describing the coordination of activities under the federal coal management program.
- November 26, 1980, cooperative agreement with the U.S. Geological Survey for operations under solid mineral leases and permits.
- December 3, 1981, memorandum of understanding with the U.S. Geological Survey and the BLM for the geothermal steam leasing program.
- December 11, 1989 memorandum of understanding with the MTDEQ (formerly Department of State Lands) to promote efficiency and effectiveness in administration and regulation of mineral resources.
- July 31, 1990, memorandum of understanding with the Office of Surface Mining Reclamation and Enforcement describing the management of surface coal mining operations on NFS lands.
- November 11, 1991, interagency agreement with the BLM describing the procedures by which the FS could authorize the BLM to offer NFS lands for oil and gas leasing.
- November 19, 1991, interagency agreement with the BLM describing the procedures for coordinated administration of oil and gas operations on federal leases within the NFS.

### **3.29.3 Best available scientific information used**

Information regarding the geology, renewable, and nonrenewable mineral and energy resources of the HLC NF is based on information from numerous sources, including statutes, laws, regulations, FS manuals, State of MT Natural Resource Information System data, Forest project and permit files, Montana Bureau of Mines and Geology publications and data, MTDNRC information, BLM minerals forecasts, U.S. Geological Survey published documents and maps, U.S. Bureau of Mines published documents, Environmental Protection Agency website and published documents and other literature.

The BLM keeps official records on leasable minerals and unpatented mining claims on public lands. Current records are kept in the Legacy Rehost 2000 (LR 2000) database. These records are the source for the documentation of leasable minerals and unpatented mining claims on the HLC NF.

### 3.29.4 Affected environment

A variety of mineral deposit types and mineral resources, including gold, silver, and copper, occur within the boundaries of the Forest. With respect to NF management, mineral resources are divided into three groups: locatable minerals, leasable minerals, and mineral materials. The authority of the FS to influence and regulate the exploration, development, and production phases of mining operations varies with each group. As a result, the FS manages mineral resource programs that are specific to each group.

#### Geology

The NFS lands managed by the HLC NF lie within the Northern Rocky Mountain and the Missouri Plateau Physiographic regions as mapped by the U.S. Geologic Survey (G. S. U.S. Department of the Interior, 2000). The planning area is mostly within the Rocky Mountain physiographic region, which includes the visually stunning Rocky Mountain Front area; southward to the Upper Blackfoot, Divide, Elkhorn and Big Belt Mountains; and eastward to the Little Belts, Castles and Crazy Mountains areas. The island mountain ranges including the Big and Little Snowies, and Highwoods, as well as the more moderate terrain draping the Rocky Mountain Front eastward, are included within the flat-topped and dissected plateau area of the upper Missouri River physiographic region (ibid). Complex and diverse geology characterizes these regions.

#### Rock units

Rock unit descriptions include formations or rock types found across the forests but not necessarily in every part of the forest. In fact, some rock types are localized in their occurrence. Both forest regions are primarily underlain either at the surface or at depth by a wedge-shaped sedimentary rock package that includes the Precambrian Belt Supergroup which is tens of thousands of feet thick in the western part of the forest areas and tapers to several thousand feet thick in the easternmost forest areas. One area of much older Precambrian crystalline metamorphic rocks occurs underlying the Belt Supergroup sedimentary rocks in the Little Belt Mountains, unique for its occurrence in central Montana. These very old rocks include metamorphosed diorite that is about 2.6 to 2.8 billion years old, some of the oldest rocks in Montana. Also in the Precambrian crystalline rocks are gneisses composed of quartz and feldspar, and an unusual rock called the Pinto Diorite which consists of white feldspar ovoids in a matrix of black hornblende (Weed, 1900). These rocks occur in the Belt Creek canyon between Neihart and Monarch.

#### Structure and history

The visible rock units of the forest areas are the result of an interesting and complex uplift and erosion history in western Montana as well as throughout the Rocky Mountains of North America.

#### Geologic areas of interest

As a result of the geologic events and processes, a variety of noteworthy scenic and/or geologically interesting, and geologically hazardous areas occur within the forest lands planning area (Table 279). Areas of geologically scenic and interesting areas are summarized below.

**Table 279. Geologic areas of scenic and academic interest in HLC NF planning area**

GA	Feature	Type	Description	Management framework
Big Belts	Gates of the Mountains	Scenery, Views of Gates of Mountains Wilderness area, motorized recreation river	Renowned scenery as a result of barren, steep limestone cliffs in a canyon setting. Geologic feature of academic interest because it is an outstanding, accessible example of overthrust style structural deformation	No special restrictions, motorized aquatic recreation dominated area
Little Belts	Smith River - WSR	Scenery, nonmotorized Recreation river - designated in part	Popular floatable river that is administered by Montana Fish Wildlife and Parks permit system in cooperation with the FS. Floaters	WSR management restrictions

GA	Feature	Type	Description	Management framework
		for its unique geology	start in Precambrian Belt sedimentary units and float 'upsection' into late Mesozoic sedimentary units - stunning cliffs and canyon scenery.	
Little Belts	Kings Hill Scenic Byway to Sluice Boxes State Park along Belt Creek	Scenery, Exposed limestone cliff walls, unusual geologic occurrence of Precambrian crystalline rocks	Motorized driving corridor with views of numerous mountain ranges including rocky mountain front from Kings Hill pass, as well as exceptional rock formations and waterfalls exposed along corridor	Designated federal scenic byway
Rocky Mountain Range and northeastern portion of Upper Blackfoot	Rocky Mountain Front Overthrust Belt	Scenery, large scale with views of Bob Marshall and Scapegoat Wilderness areas; Geologic feature of academic interest	Stunning and renowned scenery as a result of barren, steep limestone cliffs carved by alpine glaciers juxtaposed abruptly adjacent to rolling foothills. Geologic feature of academic interest because it is an outstanding, accessible example of overthrust style structural deformation. Scenery accessible to highway travelers along the front area and to nonmotorized backcountry users in the backcountry portion of the area.	9/25/2000 - Forest Plan Amendment Mineral Withdrawal withdrawing 405,000 acres from location of mining claims and mineral development 12/31/2006 - Congressional act - Withdrawal of certain federal land and interests in certain federal land from location, entry, and patent under the mining laws and disposition under the mineral and geothermal leasing laws.
Rocky Mountain Range, Little Belts, Snowies, Divide, and Big Belts	Caves	Natural geologic features occurring in Devonian to Mississippian carbonate sedimentary rock units. Academic and scientific interest.	Natural geologic features many that have been inventoried. Several very popular with the public and publicly accessible. Most are less well known except to caving organizations.	Two Nationally Significant caves on Lewis and Clark NF and eight Nationally Significant caves on Helena NF. Lewis and Clark Forest Plan amendment #13 provides management direction specific to the cave resource on the forest.

### *Paleontological resources*

Paleontological resources are broadly synonymous with “fossils,” as defined by statute (the Paleontological Resources Preservation subtitle of the Omnibus Public Land Management Act (16 U.S.C. 470aaa to 470aaa-11 (2009; “the Act”)) and in FS regulations (36 CFR Part 291). The Act and the regulations stipulate that all paleontological resources on NFS shall be managed by the Secretary of Agriculture using scientific principles and expertise.

### *Geologic hazards*

There are no inventory of strictly geologic hazard features in the planning areas, however an evaluation of hazards associated with recreation sites was prepared in 2011 and about a third of the sites have some type of potential geologic hazard that is included as part of monitoring site conditions (U.S. Department of Agriculture, Forest Service, 2011; U.S. Department of Agriculture, Forest Service,, 2011).

### *Mineral and energy resources*

The occurrence of precious and base metal minerals is the backdrop for much of the cultural history of the forest areas, particularly the Helena NF portion of the planning area. These occurrences impact land management to the present day due to the patenting of hard rock mining claims, development of mining roads, and location of rural communities surrounding and within the forest areas.

Energy resources have been explored across much of the planning area since the late 1950's but are less of a factor in development in and around the forest planning area to date because notable resources have not been discovered and/or tapped. The Rocky Mountain Front GA, the area with the most potential for hydrocarbon deposits in the two-forest planning area, is unavailable for the exploration and development of hydrocarbons due to mineral withdrawal and congressional action. However, less well-explored areas that have hydrocarbon potential, albeit low, occur in other portions of the planning area. This includes the southern portions of the Elkhorn and Big Belt Mountains, the northern portion of the Big Belt Mountains, and the eastern portion of the Lincoln Ranger District. Wind energy and geothermal energy, in addition to oil and gas energy deposits, are found in the planning area. As technology improves, and if access to explore for these deposits expands due to changes in federal policies, the search for and discovery of notable resources may occur in the future. There has been no production of hydrocarbon, wind, or geothermal deposits to date on the federal lands of the planning area.

Mineral material resources include sand, gravel, building or dimension stone, and riprap or general pit run for construction and industrial purposes. The geology of the planning area lends itself to a variety and abundance of general construction use materials and decorative stone applications.

### *Locatable minerals*

Locatable minerals are those valuable mineral deposits subject to exploration and development under the General Mining Law of 1872 as amended.

The forest areas have been the focus of locatable mineral activities, precious and base metal exploration and mining, since the 1860's. Most of the lands of the planning area are open to the location of unpatented mining claims with the exception of designated wilderness areas, other nonwilderness lands withdrawn from mineral entry and NFS lands where the mineral estate has been separated from the surface estate. Approximately 88% or 870,000 acres of the Helena Forest area is open to the location of unpatented mining claims and approximately 34% or 640,000 acres of the Lewis and Clark NF area is open to the location of mining claims. The Helena NF areas have had substantially more unpatented mining claims and mining activity than the Lewis and Clark NF areas owing to the inherent geology and occurrence of mineral resources.

A large proportion of the Helena NF is included in designated historic mining districts and also portions of the Jefferson Division of the Lewis and Clark NF. Primary mineral deposits that have been developed to date include placer gold, as well as lode deposits of gold, silver, copper, lead, zinc and sapphires. Types of locatable mineral activity occurring on the forest include 1) historic and recent placer mining, and 2) historic and recent hard rock (lode) mining.

### **Historic and recent placer mining**

Many drainage bottom areas have been patented as a result of placer mining. The estimated amount of gold mined from the gulches of the Helena NF is over 2.7 million ounces. The primary GAs that have had historic placer mining include the Big Belts, Divide, and Blackfoot River areas. A relatively small amount of placer mining has occurred in the Little Belts GA, primarily on the east side of the range in the Yogo Creek drainage area.

Current placer mining areas are located in the drainages of the Elkhorns, Big Belts, Divide, and Blackfoot River areas as well as the eastern Little Belts. Most of the currently permitted or permitted recent past operations are small scale resulting in much less than an acre of disturbance on an annual basis. Annually the forests administer 25-40 small-scale placer projects which range from hand scale work to small scale equipment work.

### **Historic and recent hard rock (Lode) mining**

Hard rock mining activity is the pursuit of locatable type minerals such as gold, silver, copper, lead, and zinc in mineralized areas where the minerals are found in bedrock. Most of the historic locatable mining activity

involved the development of underground workings such as adits and shafts to exploit mineralized vein structures. Early in mining history, mining areas became divided into mining districts where the miners would organize and develop rules and structure for claim location, development, and marketing. Mining districts are still an identifying characteristic of unpatented mining claim location and mineral activity areas. Each GA has a unique hard rock mining history; more information is available in the specialist report. The Divide GA has the greatest concentration of historic lode and placer mines of the two forests.

### **Public safety and other impacts**

Hundreds of prospect-level to developed mine sites, as well as public safety hazards and environmental impacts have been inventoried (Hargrave et al., 1998; Montana Department of Environmental Quality, 1995) and are known to occur on NFS lands of the planning area. In 1993 - 1994, the MT Department of State Lands Abandoned Mine Reclamation Bureau conducted a state-wide inventory of abandoned and inactive mine sites to characterize and rank the extent of public safety and environmental problems associated with these sites. Subsequent to the publication of these findings, the Environmental Protection Agency was requested to consider listing several areas of concentrated mine sites as federal superfund sites. These are discussed in detail below.

- Hazardous mine openings and features include shafts, adits, ventilation openings, buildings, highwalls, glory holes, and collapsing piles. Many had caved over the years only to be reopened by erosive processes or discovered when a fire burned through an area and removed its vegetative cover. Some have become dumping areas for garbage. Many of these features have been inventoried and addressed in the past 20 years as part of a national effort by the FS and other agencies. Some features may provide habitat for bats. Therefore, surveys for bats are also carried out to help determine appropriate closure devices or methods. Response actions have included backfilling, grating, foam plugs, installation of gated culverts, and combinations of the above. More work remains due to the extensiveness of mining activity in the planning area. New sites are regularly discovered or reported by the public, field - going staff, and minerals administrators. The forests in the planning area typically address 20 - 30 hazardous features annually.
- Hard rock mine sites and associated metal contaminants and environmental issues are documented in the findings of the Montana Department of State Lands Abandoned Mine Reclamation Bureau (Montana Department of Environmental Quality, 1995) and Metesh and others (1998) . The specialist report contains a summary of the inventoried hard rock mine sites with resources issues by GA, including the number of reclaimed mine sites in those areas.
- Water quality impairments, as a result of historic hard rock mining, cause impacts to many surface and some ground waters of the planning area. The impaired water characteristics typically include low pH, elevated metal contaminants, loss or reduction of aquatic life, stream sediments containing metal contaminants, loss of streamside vegetation, and localized impaired groundwater. In some primary drainages, these impairments extend for miles downstream. While inventory and reclamation efforts continue to work toward addressing impaired waters, the scope of this issue has not been well defined nor is there a management framework that places priority on addressing a primary resource issue such as this.
- Many of the inventoried mines have been reclaimed in whole or in part by the FS, State of Montana, Environmental Protection Agency or jointly by the agencies. Reclamation of FS sites with hazardous substances has been done under the agencies' Comprehensive Environmental Response, Compensation, and Liability Act authority.
- As a result of the inventory results and other inventory/investigation efforts by the State, FS and Environmental Protection Agency, several of the mining areas have become listed State or Federal Superfund sites due to their mining-related impacts (Agency, 2014). These include one State of Montana superfund site, the Upper Blackfoot Mining Complex site and three federal Superfund sites, the Upper Tenmile Creek Mining Area site, Barker-Hughesville Mining District site, and Carpenter-Snow Creek Mining District site. These sites and ongoing activities are described further in the specialist report.

### *Leasable minerals*

Leasable mineral and energy resources include oil, gas, coal, geothermal, oil shale, and other solid minerals. Leasable public domain minerals are leased under authority of the Mineral Leasing Act of 1920, as amended. Acquired minerals are leased under the authority of the 1947 Mineral Leasing Act for Acquired Lands, as amended.

### **Nonrenewable energy minerals**

In August 1998 the Lewis and Clark NF finalized their oil and gas leasing FEIS and issued their ROD. In 1999 the Helena NF finalized their oil and gas leasing FEIS, their final supplemental EIS, and their ROD for oil and gas leasing. The records of decision were signed by the Forest Supervisor and the State Director of the BLM. At that time there were few acres under lease on the Helena NF. On the Lewis and Clark NF there were several thousand acres of suspended leases on the Rocky Mountain Range GA. The leasing analyses and decisions followed the new regulations at 36 CFR228 Subpart E and included two components and a forest plan amendment. These decisions are the current situation for nonrenewable mineral resources and are summarized in Table 280.

**Table 280. Summary of acres for leasing as per EISs and RODs 1997 and 1998**

<b>Forest</b>	<b>Legally unavailable</b>	<b>Discretionarily unavailable</b>	<b>No lease</b>	<b>No surface occupancy</b>	<b>Controlled surface use, timing limitations, or both</b>	<b>Standard lease terms</b>
Lewis and Clark	614,458	0	356,111	363,033	528,851	0
Helena	144,500	185,100	0	384,700	258,700	24,700

Activity in the number of lease requests from industry is currently low in the planning area. There is no current exploration or development activity on NFS lands. A leasing decision will not be a part of the Plan. There is an interest in oil and gas leasing on the forest and there may be a need for a future oil and gas leasing decision as oil and gas leasing is part of the acceptable uses of the HLC NF. Until a leasing decision is completed no oil and gas exploration or development can take place.

- Currently, there are zero authorized oil and gas leases in effect for the Helena NF. There are eight lease requests, covering 15,259.13 acres that have been deferred pending the resolution of oil and gas leasing in roadless areas in the south Big Belts. These leases were requested in connection with a gas drilling project that occurred in 2004 - 2006 near Ringling, MT.
- As a result of the 1997 ROD for Oil and Gas Leasing on the Lewis and Clark NF, most of the Rocky Mountain Range GA was identified as discretionarily unavailable for leasing, excluding the 18 leases that existed at the time of the analysis and decision. These leases were suspended by the BLM and were then subsequently cancelled in 2016 and 2017. One of the 18 leases remains in a suspended status pending outcome of litigation (MTM 53323) and will remain in an authorized status until litigation is resolved. There are zero pending oil and gas lease parcels for the Lewis and Clark NF.

There are minor surface resource impacts from historic oil and gas activity on the Helena NF area. A single well was drilled on Hogback Mountain in the 1980's that resulted in construction of a short (less than ¼ mile) access road and drill pad. The road and pad area have been reclaimed but the disturbance remains visually apparent. There are no apparent impacts from past seismic activities on the Helena NF. There has been no impact from the current leases in the Big Belts because there has been no surface activity on these leases.

There are no surface resource impacts from oil and gas related activities on the Jefferson Division of the planning area. There are no impacts on the cancelled leases in the Badger-Two Medicine area because there has been no surface activity on these leases. There are lingering impacts from 1980's era oil and gas leasing and development on the Rocky Mountain Range GA including un-reclaimed roads and noxious weeds.

### **Coal and other nonrenewable leasable minerals**

There is very little occurrence of or potential for coal and other nonrenewable leasable minerals in the two-forest area due to the intrinsic geology and the limited number of acres of acquired lands.

### ***Renewable, leasable mineral, and energy resources***

Renewable, leasable mineral resources include geothermal, wind, and solar energy resources.

On the Helena NF, 737,819 acres are available for geothermal leasing. On the Lewis and Clark NF, 31,730 acres near White Sulphur Springs are available for geothermal leasing. Portions of the planning area have some favorability for the occurrence of geothermal resources.

There is a known geothermal resource area east of NFS lands in the Marysville vicinity with a capped exploration well that is being monitored (Quality, 2014). There are currently no exploration or development projects for geothermal energy resources in the planning area. There are no impacts on NFS lands from geothermal exploration or development activity. The forecast for leasing and potential exploration for geothermal energy on the Helena NF area is deemed to be low. The Lewis and Clark NF would have to undertake a geothermal leasing NEPA analysis prior to making most of the forest available for leasing, thus the forecast for activity on those lands is deemed to be very low.

The planning area was found to have potential for the development of wind energy due to the available resource and proximity to transmission lines. The planning area was not found to have potential for the development of solar energy (U.S. Department of Agriculture and U.S. Department of Energy, 2005).

### ***Salable minerals***

These minerals include petrified wood, common varieties of sand, rock, stone, cinders, gravel, pumice, clay and other similar materials. Such common variety mineral materials include deposits that, although they have economic value, tend to be relatively widely available and do not have a distinct and special value. These minerals are most commonly used as building stone, landscaping, and constructions materials.

Salable mineral uses and developed pits are very common on the Jefferson Division of the Lewis and Clark NF. The Helena NF portion of the planning area has recurring salable minerals uses but at a much lower level and with very few developed pits.

Annually the planning area issues about 10-20 free use mineral material permits and has about 10 in-service project uses. The average annual in-service use is about 3,000-5,000 cubic yards combined of material of all types per year. Primary materials used include crushed aggregate, pit run and rip rap. Salable mineral resources development is largely tied to road development activities conducted by the agency.

## ***3.29.5 Environmental consequences***

### **Effects common to all alternatives**

The right to access locatable mining operations is a provision of the 1872 mining law. Access to a mining operation on NFS must be reasonable as defined by law and statute. New roads, trails or other types of access may be approved for a proposed mining operation as long as the proposal is incident to mining and within the scope of the next logical phase of mining development.

The Big Snowies and the Middle Fork Judith WSAs would be managed and regulated according to the direction provided in Public Law 95-150. This would continue to make 170,095 acres no longer compatible for mineral leasing and salable minerals, but still open to locatable mineral prospecting, exploration and development.

All IRA boundaries and acreages within the planning area were firmly established as a part of the 2001 Roadless Area Conservation Rule and would not change in any of the alternatives. Salable mineral

development would not be compatible in these areas, but locatable mineral development is allowable within IRAs.

The current areas that are congressionally withdrawn from mineral entry would be carried forward in all alternatives. Since direction for wilderness management is detailed in law, regulation, and agency policy and in specific management plans, the effects to congressionally designated wilderness as a result of the Plan do not differ by alternative. In all alternatives, the acres of the existing Bob Marshall, Scapegoat, and Gates of the Mountains Wilderness Areas would remain the same. Designated wilderness areas are withdrawn from mineral entry. Mining activities may still occur in designated wilderness areas as long as the proponent has demonstrated a valid existing right. Valid existing rights occur when unpatented mining claims on NFS lands i) Were properly located prior to an area being designated as a wilderness area; (ii) Were properly maintained thereafter under the applicable law; (iii) Were supported by a discovery of a valuable mineral deposit within the meaning of the U.S. mining laws prior to an area being congressionally designated as a wilderness area, which discovery has been continuously maintained since that date; and (iv) Continue to be valid.

There are many areas across the HLC NF that have been administratively withdrawn from mineral entry, including campgrounds, ranger stations, workstations, powerline corridors, and trailheads to name a few. These areas are not open to mineral entry and, therefore, locatable, leasable and salable minerals are not able to be developed in these areas.

Under all alternatives, forest plan components associated with access and recreation, vegetation, fire and fuels, watershed, soil, riparian, aquatic, lands, and special uses management would not result in any change in the lands available for locatable minerals, leasable minerals, or saleable minerals development.

#### *Future placer mining activity*

The future prospects of placer mining are related to the price of gold, accessibility of drainages to this type of mining activity, and available placer gold resource. The potential for a large, unworked, profitable gold bearing gravel resource appears to be low.

#### *Future hard rock mining*

Recently with the high prices of gold, companies have turned to removing old waste dumps and tailings piles to be reprocessed at custom mills. Several projects of this type have occurred annually on or around the Helena NF area in the past three years. This trend is expected to continue as long as gold prices remain strong and custom mills are available for processing the ore.

#### *Future locatable minerals*

Hard rock mineral activity in the next 10-15 years is projected to be approximately what is currently occurring, with a few exceptions which includes the: 1) hobby scale placer mining projects, 2) mine waste removals for reprocessing, 3) limited, small scale underground mine development on primarily gold prospects, and 4) continued exploration/development activities on deposits adjacent to forest lands such as the Black Butte Copper project adjacent to forest lands in the south Little Belts and exploratory activities to seek nearby, similar mineralization, Seven-Up Pete deposit, and Marysville area deposits. The primary areas of this activity are likely the areas of the current activities including the Upper Blackfoot, Divide, Elkhorns, and Big Belts GAs due to the inherent mineralized character of these regions. Two areas in the Little Belts are also of interest including the Sheep Creek area which is just outside NFS lands, and the Big Ben deposit in Carpenter Creek.

There is always the potential for an unforeseen exploration project on a known or previously unknown mineralized area where geologists have projected a valuable resource that was not previously exploited. The primary target of this type of activity is likely gold and copper.



**Future saleable minerals**

Federal Superfund activities will drive the need for a variety of mineral material products including topsoil, cover soil, drain rock, and rip rap particularly in the Belt Creek drainage area of the Little Belts GA, near the State superfund area in the Upper Blackfoot GA, in the Upper Tenmile federal Superfund site, and Little Blackfoot areas. There is an ongoing need for a certain level of material pits for use in forest system road maintenance activities. These project activities may result in an increased, localized demand for mineral materials from NFS lands. Stream restoration projects often require specific and graded material types. Suitable materials of these types may be found on forest lands. Public demand and interest will also drive activity related to mineral materials in the future.

**Future leasable mineral and energy resources**

This forecast of potential for leasable mineral activity is based on the Reasonably Foreseeable Development Scenarios prepared by the BLM for their resource management revision efforts (Glover & Stilwell, 2014) . The project planning area is covered almost entirely within the BLM’s Lewistown Planning Area and Butte Resources Areas (U.S. Department of the Interior, Bureau of Land Management, Butte Field Office, 2008) . A small amount of the BLM Missoula Resources Area covers the western portion of the Upper Blackfoot GA; however, this planning area has not been updated since 1984. Thus, the forecast for leasable mineral activity for this area (Table 281) is based on the HLC NF reasonably foreseeable development scenario as published in the 1998 forest leasing analysis (USDA 1998).

**Table 281. Nonrenewable (oil and gas) mineral resources forecast**

<b>GA</b>	<b>Historic activity</b>	<b>Potential for occurrence of oil and gas resources</b>	<b>Reasonably foreseeable development</b>
Big Belts	Moderate - seismic activity and wells drilled on northeast flank of Big Belts and east of the southern Big Belts south of Highway 12.	Moderate - North end is part of Imbricate Thrust Zone play area which has favorable geology but no proven resource. Low-Moderate - Southeast end of range has overthrust geology.	Low - expectation of up to five wells drilled in planning period in the area, however only a portion of the area is federal land.
Castles	Low - no historic drilling activity on federal lands	Low - unfavorable geology	Very Low
Crazies	Low - no historic drilling activity on federal lands	Low - unfavorable geology except for very northwest portion of the federal lands which has moderate occurrence potential.	Very Low
Divide	Low - no wells, no leases in past 20 years	Low - unfavorable geology	Very Low
Elkhorns	Low - no wells, no leases in past 20 years. One deep well south of Johnny’s Gulch in 1991.	Low - unfavorable geology except in very southern portion of the area and just west of the Limestone Hills	Very low. Area is not open to leasing.
Highwoods	Low - one historic well drilled on federal lands with no show of resources	Low - unfavorable geology	Very Low
Little Belts	Low - no historic drilling activity on federal lands	Low - unfavorable geology	Very Low
Rocky Mountain Range	High - numerous oil and gas exploration wells drilled in pre-2014 nonwilderness portions of the area	High on very eastern edge of the area. Moderate to low westward.	No Activity* - area withdrawn from mineral entry and additional area added as wilderness in 2014.*With the exception of the

GA	Historic activity	Potential for occurrence of oil and gas resources	Reasonably foreseeable development
			suspended leases in the Badger-Two Medicine area.
Snowies	Low - no historic drilling activity on federal lands	Low - unfavorable geology	Very Low
Upper Blackfoot	Low - limited leasing in past 20 years. All leases expired.	Low - area is within Thrust Belt but rock formations not favorable	Very Low - Most of area has No Surface Occupancy stipulation. Occurrence potential is low.

There are currently no requests for leases, nor is there any historic or ongoing exploration or development projects for renewable energy resources (wind/solar) on the federal lands in the planning area. There are no known commercial solar energy installations in the planning area, and none are expected unless there is a substantial change in the economic climate and government supports. There are wind developments on private lands south of the Highwoods GA and in the vicinity of Judith Gap, which is southwest of the Big Snowies, east of the Little Belts, and east of White Sulphur Springs between the Little Belts and Castle Mountains. The potential for new development of wind energy on federal land in the planning horizon of 15 years is unknown.

**Effects common to all action alternatives**

The Plan contains the same plan components for geology, minerals, and energy for all action alternatives. The expected effects of these components are described in Table 282.

**Table 282. Summary of plan components for geology, minerals, and energy**

Plan components	Intent and expected effects
FW-ENIM-DC-01, 03 and 04, FW-EMIN-STD-02, FW-EMIN-GDL-03	These desired conditions would result in recognition of the importance of geologic features and resources for ecological, scientific, educational, interpretative, scenic, recreational, and paleontological values. The standard and guideline would result in protection of these resources and features.
FW-ENIM-DC-02 and 07, FW-ENIM-OBJ-01, FW-ENIM-STD-01 and 03	These desired conditions would ensure that geologic hazards and abandoned mine sites are recognized and that associated risks to the human and natural environment are minimized or mitigated. The objective would result in reclamation of abandoned mines to move towards this desired condition. The standards would ensure that superfund sites are appropriately managed, and that the infrastructure and remedies at mine waste repositories are protected.
FW-ENIM-DC-05 and 06	These desired conditions would result in the HLC NF contributing to the nation’s economy by supplying energy and mineral resources, including mineral materials, while being consistent with the desired conditions for other resources to the extent practicable.
FW-ENIM-GDL-01, 02 and 04	These guidelines would ensure that authorizations for mineral development would minimize, to the extent practicable, impacts to other resource areas.
FW-ENIM-GDL-05	This guideline would ensure that mining claimants and leaseholders are notified of impending actions that may affect their claims or leased lands to minimize disruption of mining operations.

*Effects from forest plan components associated with:*

**Eligible wild and scenic river management**

During plan development, the HLC NF identified rivers as eligible for consideration as wild, scenic, or recreational rivers under the Wild and Scenic Rivers Act. Mineral activities within these eligible river corridors are still allowable.

Twenty-four of these rivers are classified as wild, for a total of 215.8 miles of river segments. Upon designation, Federal lands within the boundaries of designated river areas (one-quarter mile from the bank on each side of the river) classified as wild would be withdrawn from appropriation under the mining and mineral leasing laws by Sections 9(a) and 15(2) of the Wild and Scenic Rivers Act. Existing valid claims or leases within the river boundary would remain in effect, and activities may be allowed subject to regulations that minimize surface disturbance, water sedimentation, pollution, and visual impairment. Reasonable access to mining claims and mineral leases would be permitted. Mining claims, subject to valid existing rights, could be patented only as to the mineral estate and not the surface estate, subject to proof of discovery prior to the effective date of designation. For river segments classified as wild, no new mining claims or mineral leases can be granted.

Federal lands within the boundaries of designated river areas classified as scenic or recreational are not withdrawn under the Act from the mining and mineral leasing laws. Therefore, designated river segments classified as scenic or recreational, the filing of new mining claims or mineral leases is allowed but is subject to reasonable access and regulations that minimize surface disturbance, water sedimentation, pollution, and visual impairment.

### **Grizzly bear management**

Habitat security requirements and other mineral mitigation measures for grizzly bear can be expected to affect locatable, leasable and salable mineral exploration and development. Where roads, and the access they provide, are necessary, limitations on road construction and operating seasons can be expected to have the effect of prolonging exploration or development work. Areas most affected would be bear management units in the NCDE primary conservation area (see standards FW-STD-E&M-01 thru 07 and guidelines (FW-GDL-E&M-01 thru 06). With alternative C, the no surface occupancy stipulation would apply to new oil and gas leases in all of the NCDE primary conservation area and zone 1. Although the potential on the Forest is very low, the no surface occupancy acreage proposed in alternative C would make it more costly, or infeasible to develop oil and gas resources within the primary conservation area and zone 1.

### **Canada lynx management**

Locatable, leasable and salable mineral exploration and development is also likely to be affected in LAUs in occupied habitat. Guideline HU G12 in the NRLMD ROD gives direction that winter access should be limited to designated routes or designated over-snow routes.

### **Elk and big game management**

EH-EMIN-GDL-01 may result in timing restrictions for mineral activities due to no surface occupancy requirements.

### **Alternative A, no action**

The no-action alternative is represented by the existing 1986 Forest Plans, as amended. Law and regulation that have been adopted since the 1986 plans was analyzed as part of the no-action alternative (for example, the designation of IRAs).

### ***Locatable minerals***

Because alternative A recommends three wilderness areas, 34,265 acres would potentially be withdrawn from mineral entry under the U.S. General Mining Laws if these areas were to become designated. RWAs are open to mineral entry under the US mining laws until such time as they are congressionally withdrawn from mineral entry subject to valid existing rights. There would be no change to the miles of roads or trails available to motorized or mechanized transport or to the miles of open roads access to mineral or energy proposals.

### *Leasable minerals*

Alternative A would continue to make 34,265 acres administratively unavailable for mineral leasing if these areas were to become Congressionally designated wilderness areas. There would be no change to the miles of roads or trails available to motorized or mechanized transport or to the miles of open roads for access to leasable proposals.

### *Salable materials*

The three areas allocated as RWAs in alternative A (34,265 acres) would not be compatible for disposal of mineral materials. There would be no change to the miles of roads or trails available to motorized or mechanized transport or to the miles of open roads to access mineral materials.

## Effects that vary by alternative

### *Locatable minerals*

Alternative B recommends nine wilderness areas, totaling 213,076 acres that would potentially be withdrawn from mineral entry for locatable minerals. RWAs are open to mineral entry under the U.S. mining laws until such time as they are congressionally withdrawn from mineral entry subject to valid existing rights. Mining activities may still occur in designated wilderness areas as long as the proponent demonstrates valid existing rights. There would be 12 miles of roads no longer available to motorized access and 0.10 miles of trails no longer open for motorized access.

Alternative C would allow for increased access to mineral and energy projects compared to alternative B because the number of roads or trails available to motorized or mechanized transport and miles of roads open is not restricted in those RWAs. Alternative C recommends nine wilderness areas, totaling 213,076 acres that would potentially be withdrawn from mineral entry for locatable minerals.

Alternative D would be the most restrictive alternative to mineral and energy development as it proposes the most acreage for RWAs. It also proposes the largest number of roads or trails no longer available to motorized or mechanized transport and the most miles of roads no longer open that would cause access restrictions for mineral and energy development. Alternative D recommends sixteen wilderness areas, totaling 474,589 acres that would potentially be withdrawn from mineral entry for locatable minerals. There would be 23 miles of roads no longer available to motorized access and 59 miles of trails no longer open for motorized access.

Alternative E would be the least restrictive of all of the alternatives to energy and mineral development. This alternative does not propose any RWAs and does not propose any reduction in the miles of roads or trails available to motorized or mechanized transport or the number of miles of roads open. Because alternative E has no RWAs, no additional NFS lands are expected to be withdrawn from mineral entry for locatable minerals. There would be no change to the miles of roads or trails available to motorized or mechanized transport or to the miles of open roads access to access mineral or energy proposals.

Alternative F would be in the mid-range of restrictiveness for mineral and energy projects compared to all the other alternatives. Alternative F recommends seven wilderness areas, totaling 153,325 acres that would potentially be withdrawn from mineral entry for locatable minerals, if those areas are designated congressionally. Mining activities may still occur in designated wilderness areas as long as the proponent demonstrates valid existing rights. There would be 5.75 miles of roads no longer available to motorized access and 0.10 miles of trails no longer open for motorized access.

Nevada Mountain is a RWA in alternatives B, C, D and F. This area has been the location of historic and current mining activity. As of the writing of this report, there are over one hundred unpatented mining claims within the boundaries of this area. There is a very high potential for future mineral prospecting, exploration and development in this area. Mining activities could detract from the "wilderness character" of this area. This RWA includes the Nevada Mountain area and headwaters of Washington to Nevada Creeks, north and east

including McClellan Gulch, and then easterly to upper Poorman Creek. This area is underlain by a granitic stock that has intruded into Belt series argillites and quartzites and has resulted in mineral deposits that have been prospected and mined by hard rock and placer mining methods. A potentially larger ore body at depth is suspected (Tysdal, Ludington, & McCafferty, 1996). McClellan Gulch was a very rich placer gold tributary of Poorman Creek. It has been estimated that \$7,000,000 in gold came from the gravels of this gulch (McCleran, 1983; Pardee & Schrader, 1933).

### *Leasable minerals*

Alternative B would make 213,076 acres administratively unavailable for mineral leasing if these areas were to become Congressionally designated wilderness areas. There would be 12 miles of roads no longer available to motorized access and 0.10 miles of trails no longer open for motorized access.

Under alternative C 213,076 acres would be administratively unavailable for mineral leasing if these areas were to become Congressionally designated wilderness areas.

Under alternative D, 474,589 acres would be administratively unavailable for mineral leasing if these areas were to become Congressionally designated wilderness areas. There would be 23 miles of roads no longer available to motorized access and 59 miles of trails no longer open for motorized access for leasable proposals.

Since there are no RWAs in alternative E, an additional 34,265 acres may be compatible for leasable materials. There would be no change to the miles of roads or trails available to motorized or mechanized transport or to the miles of open roads to access leasable materials. However, alternative E is affected by the IRA management regulations. Road construction or reconstruction associated with mineral leases may not occur in IRAs.

Alternative F would be in the mid-range of restrictiveness for leasable proposals compared to all the other alternatives. Alternative F recommends seven wilderness areas, totaling 153,325 acres that would be administratively unavailable for mineral leasing if these areas were to become Congressionally designated wilderness areas. There would be 5.75 miles of roads no longer available to motorized access and 0.10 miles of trails no longer open for motorized access.

### *Salable materials*

Areas allocated as RWAs would not be compatible for disposal of mineral materials. Alternative B would make 213,076 acres not compatible for the disposal of mineral materials. Access to salable minerals would decrease as there would be 12 miles of roads no longer available to motorized access and 0.10 miles of trails no longer open for motorized access.

Under alternative C 213,076 acres would not be compatible for the disposal of mineral materials.

Under alternative D, 474,589 acres would not be compatible for the disposal of mineral materials. Access to salable minerals would decrease as there would be 23 miles of roads no longer available to motorized access and 59 miles of trails no longer open for motorized access for leasable proposals.

Since there are no RWAs in alternative E, an additional 34,265 acres would be compatible for the disposal of mineral materials. There would be no change to the miles of roads or trails available to motorized or mechanized transport or to the miles of open roads to access mineral materials.

Alternative F would be in the mid-range of restrictiveness for salable mineral proposals compared to all of the other alternatives. Alternative F recommends seven wilderness areas, totaling 153,325 acres that would be administratively unavailable for salable minerals. There would be 5.75 miles of roads no longer available to motorized access and 0.10 miles of trails no longer open for motorized access.

### Cumulative Effects

Cumulative effects evaluate the potential impacts to mineral resources from the action alternatives when combined with past, present, and reasonably foreseeable actions. All lands within the HLC NF GA boundaries form the geographic scope for cumulative effects. The temporal bound would be the life of the Plan, which is estimated to be a 15-year time span.

Requests for approval of small lode and placer mining operations may occur, but it is not possible to predict how many may be submitted in any given year, or how many might be approved. There is a high potential for locatable mineral development on most of the Forest. Since Congress has imposed a moratorium on patenting of mining claims, there would be no changes in the acres of patented lands unless Congress was to lift the moratorium.

Given the low probable occurrence of leasable minerals other than oil and gas on open/available lands on the HLC NF, the cancellation of the oil and gas leases on the Rocky Mountain Front by the U.S. Department of the Interior there is little likelihood of mineral lease applications being made.

Mineral material use can be expected to continue for in-service needs (e.g., road maintenance and watershed improvement activities) and as a salable commodity to the public and would result in the further depletion of that nonrenewable mineral resource from NFS lands.

Reclamation work is likely to occur on select abandoned mine sites as well as on mineral material sites that have reached the end of their useful life.

Portions of the HLC NF adjoin other NFs, each having its own forest plan. The HLC NF is also intermixed with lands of other ownerships, including private lands, other federal lands, and state lands. Some adjacent lands are subject to their own resource management plans. The cumulative effects of these plans in conjunction with the 2021 Land Management Plan are summarized in Table 283, for those plans applicable to energy and minerals.

**Table 283. Summary of cumulative effects to energy and minerals from other resource management plans**

Resource plan	Description and summary of effects
Adjacent National Forest Plans	The forest plans for NFS lands adjacent to the HLC NF include the Custer-Gallatin, Lolo, Flathead, and Beaverhead-Deerlodge NFs. All plans address Energy and Minerals. Generally speaking, management of Energy and Minerals is consistent across all NFs due to law, regulation, and policy. The management of Energy and Minerals would be complementary and consistent. This includes specific adjacent landscapes that cross Forest boundaries, such as the Upper Blackfoot, Divide, Elkhorns, Crazies, and the Rocky Mountain Range.
Bureau of Land Management Resource Management Plans (RMP)	Bureau of Land Management lands near the HLC NF are managed by the Butte, Missoula, and Lewistown field offices. The Butte and Lewistown plans were recently revised, while the existing plans for the Missoula area is under revision. These plans contain components related to Energy and Minerals and would be complementary to the 2021 Land Management Plan.
National Park Service - Glacier National Park General Management Plan 1999	The general management plan for Glacier National Park calls for preserving natural vegetation, landscapes, and disturbance processes. Mineral and energy projects in the Rocky Mountain Range GA and would be consistent with these conditions
Bureau of Reclamation Plans for Canyon Ferry, 2003 and 2012	These Plans are both consistent with the 2021 Land Management Plan for Energy and Minerals.
State of Montana Plans-various for wildlife,	These plans are consistent to the 2021 Land Management Plan and acknowledge mineral and oil and gas development, seek to provide input on minerals projects and recognize the need for abandoned mine reclamation.

Resource plan	Description and summary of effects
recreation, forestry, water and conservation	
Montana Army National Guard – Integrated Natural Resources Management Plan for the Limestone Hills Training Area 2014	This Plan is consistent with the 2021 Land Management Plan for Energy and Minerals.
County Growth Policies	The County growth plans typically are consistent with and sometimes complementary to the 2021 Land Management Plan. Several County plans support mineral development and reference the 1872 mining law as well as best management practices. Several plans also recommend the need for abandoned mine reclamation.

### Conclusions

Access to locatable, leasable and salable minerals, as well as, opportunities for mineral entry, mineral leasing and mineral disposal would vary by alternative. The variations across alternatives are due to differences in RWAs, motorized, and mechanized access, as well as plan components related to restricting surface occupancy on future mineral and energy projects. Alternative E offers the most opportunities for mineral-related activities, followed by alternatives A, F, C, B and D, in order of decreasing opportunities.

## 3.30 Carbon and Climate

### 3.30.1 Introduction

Climate change is a particularly complex challenge given its global nature and inherent interrelationships among its sources, causes, mechanisms of action, and impacts. The effects of climate change observed to-date and projected to occur in the future include changes in temperature, precipitation, and disturbance patterns that drive and stress ecosystems and the benefits they provide, including degraded air quality, water resources, wildlife, carbon storage, and the quality of recreational experiences. In the context of global atmospheric carbon dioxide (CO<sub>2</sub>), even the maximum potential forest management levels described by the alternatives would have a negligible effect on global emissions and climate.

This analysis considers the following:

- The potential impacts of climate change on the HLC NF as indicated by consideration of changes in climate (e.g., temperature and precipitation patterns) and the effects of climate change impacts on ecological, social, and economic resources; and
- The potential effects of management actions on climate change as indicated by consideration of changes in carbon sequestration and storage arising from natural and management driven processes.

### Analysis area

The spatial scale of this analysis includes the forested lands of the HLC NF. The Forest consists of approximately 1,074,025 hectares (ha) (just under 2.7 million acres) of forest land, estimated by Forest Inventory and Analysis data from 2010. The effects analysis for GHG emissions is the global atmosphere given the mix of atmospheric gases can have no bounds. The temporal scale for analyzing carbon stocks and emissions focuses on the expected lifespan of the plan (10-15 years). This report includes analysis and discussion beyond this expected lifespan to provide context for potential forest carbon dynamics and factors influencing these dynamics in the future. However, estimates of future carbon stocks and their trajectory over time remain unclear because of uncertainty from the multiple interacting factors that influence carbon dynamics.

## Changes between draft and final

An updated baseline carbon assessment was conducted, utilizing new available tools from the USDA Forest Service Office of Sustainability and Climate, and is incorporated into appendix J. This report is updated based on that information, which draws upon many of the same data and literature sources described in the DEIS. In addition, a section on climate and climate change is incorporated into this report.

### *3.30.2 Regulatory framework*

There are no applicable legal or regulatory requirements or established thresholds concerning management of forest carbon or greenhouse gas emissions. The 2012 Planning Rule and associated directives require an assessment of baseline carbon stocks and a consideration of this information in management of the forests.

### *3.30.3 Best available scientific information used*

#### Climate and climate change

An ever-increasing body of knowledge exists regarding climate and climate change. This summary is based in large part upon the work of the Northern Rockies Adaptation Partnership, which is a “science-management” collaboration with the goals of 1) assessing vulnerability of natural resources and ecosystem services to climate change; and 2) developing science-based adaptation strategies that can be used by national forests to understand and mitigate the negative effects of climate change. The Northern Rockies region includes the USFS Northern Region 1 and the adjacent Greater Yellowstone area, spanning northern Idaho, Montana, Northwest Wyoming, North Dakota, and South Dakota. Five subregions are identified and assessed; the HLC NF is primarily in the Eastern Rockies subregion, with some GAs overlapping the Central and Greater Yellowstone subregions. This partnership has produced a synthesis of the BASI relative to climate change relevant to the Northern Rockies area, which is used as the BASI for this issue on the HLC NF ((Halofsky et al., 2018a, 2018b).

Global climate models are the principal source of future climate projections, and are effective at simulating global climate characteristics; however, because the spatial patterns of regional climate are far more heterogeneous than suggested by global climate model outputs, specific downscaling techniques are used to provide inputs for regional and sub-regional analyses (Daniels et al., 2012). The Northern Rockies Adaptation Partnership compiled downscaled climate information to a sub-regional level, which is a scale that is meaningful for the HLC NF and its surrounding landscapes.

The Coupled Model Intercomparison Project (CMIP) began in 1995 to coordinate a common set of experiments for evaluating changes to past and future global climate; this approach allows for comparison of results from different global climate models around the world (Halofsky et al., 2018a). CMIP3 simulations were forced with emissions scenarios from the Special Report on Emissions Scenarios, which represent futures with different combinations of global population growth and policies. Conversely, CMIP5 simulations are driven by “representative concentration pathways” which do not define emissions but rather concentrations of greenhouse gases and other agents that influence the climate, and do not assume any particular climate policy actions (ibid). The Northern Rockies Adaptation Partnership considered CMIP5 climate scenarios but also utilizes the best available information from multiple literature sources, some of which are based upon CMIP3 modeling results.

Climate projections embody a number of uncertainties, including the uncertainty of future emissions driven by socioeconomic processes and unpredictable policy choices, variability internal to a given global climate model’s simulation of weather and climate, variability related to parameterization and other model characteristics, and uncertainty or error in observed climate data used in downscaling global climate model output (Daniels et al., 2012).



## Forest carbon

The affected environment section summarizes the Forest Carbon Assessment for the HLC NF (appendix J). The carbon assessment draws largely from two recent USFS reports: the Baseline Report (U.S. Department of Agriculture, Forest Service, 2015a) and the Disturbance Report (Birdsey et al., 2019). These reports provide assessments of forest ecosystem and harvested wood product carbon stocks and flux, and the factors that have influenced carbon dynamics. The Resource Planning Act assessment (U.S. Department of Agriculture, Forest Service, 2016) and a regional vulnerability assessment (Halofsky et al., 2018a, 2018b) also provide information on potential future carbon conditions. These reports incorporate advances in data and analytical methods and collectively represent the best and most relevant scientific information available for the HLC NF.

Potential carbon effects are discussed qualitatively, with supporting estimates where possible. This is accomplished by drawing on the quantitative analysis of the impacts of past management activities on forest carbon stocks and fluxes, as well as through future-looking analysis where available (appendix J).

Key indicators:

- Carbon pools (carbon stocks), carbon uptake, CO<sub>2</sub> emissions
- Natural and human-caused influences on carbon stocks, uptake, and emissions

### 3.30.4 Affected environment

#### Climate and Climate Change

Climate is described by the long-term characteristics of precipitation, temperature, wind, snowfall, and other measures of weather that occur over a long period in a particular place (Halofsky et al., 2018a), and is a primary driver of the ecosystem. The HLC NF lies at the boundary between the warm, wet, maritime airflows from the Pacific Ocean and the cooler, drier airflows from Canada. The climate of the planning area varies, but is dominated by cold continental, cold-dry continental, and cool temperate with maritime influence (McNab & Avers, 1996). Summers are generally dry, and the precipitation in winter is primarily snow. In some areas, spring and fall precipitation is also snow. Total precipitation is generally 10-50” per year, although it can be higher in some mountainous areas. Winter temperatures can fluctuate widely, and harsh chinook winds are a highlighted climatic feature.

Historic trends in climate are correlated to changes in ecosystem components, and therefore future climate is an important component of the effects analyses for forest plan revision. Natural climate cycles have occurred historically and will continue into the future. Human activities such as fuel burning, industrial activities, land-use change, animal husbandry, and agriculture lead to increases in ambient greenhouse gases (GHG’s), which contribute to the “greenhouse effect” (Melillo, Richmond, & Yohe, 2014). Warming temperatures are the most certain consequence of increased carbon dioxide in the atmosphere (Halofsky et al., 2018a).

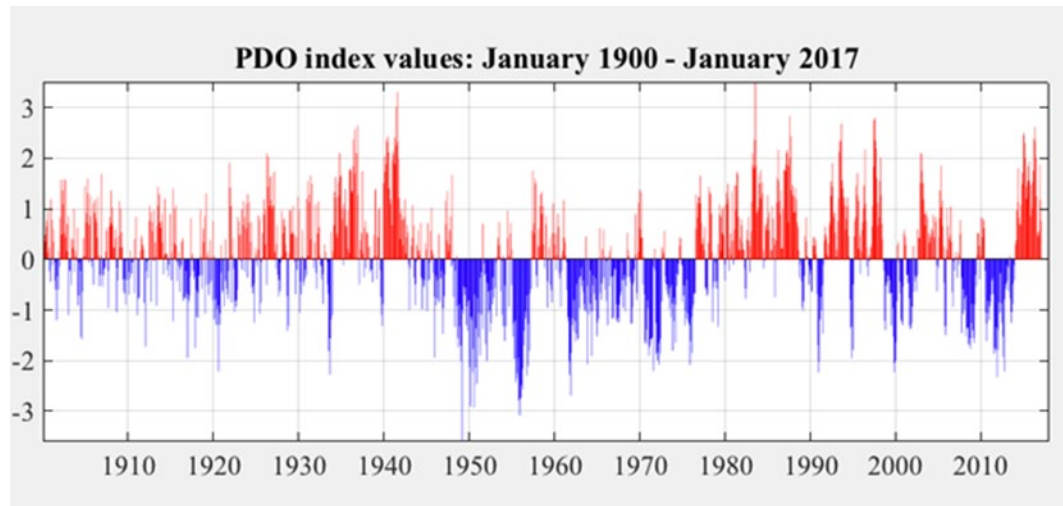
This section provides a broad overview of climate conditions for the HLC NF planning area. Each resource section of the EIS may address more specific impacts of climate where relevant.

#### *Current climate and recent historical trend*

The climate of the Northern Region fluctuates between cool and warm periods and is affected by multiple factors. The influences of sea surface temperature and atmospheric pressure are thought to directly influence drought in the western U.S. (Kitzberger, Brown, Heyerdahl, Swetnam, & Veblen, 2007). Multiple indices exist to measure sea surface temperatures, including the Pacific Decadal Oscillation, which tracks variations in the northern Pacific that tend to cycle every 20 years (Zhang, Wallace, & Battisti, 1997). Correlations between these variations and ecological disturbances such as wildfire have been shown. Also, in the Northern Rocky Mountains the majority of the variability in peak and total annual snowpack and streamflow is explained by

season-dependent interannual-to-interdecadal changes in atmospheric circulation associated with Pacific sea temperatures (Pederson, Graumlich, Fagre, Kipfer, & Muhlfeld, 2010).

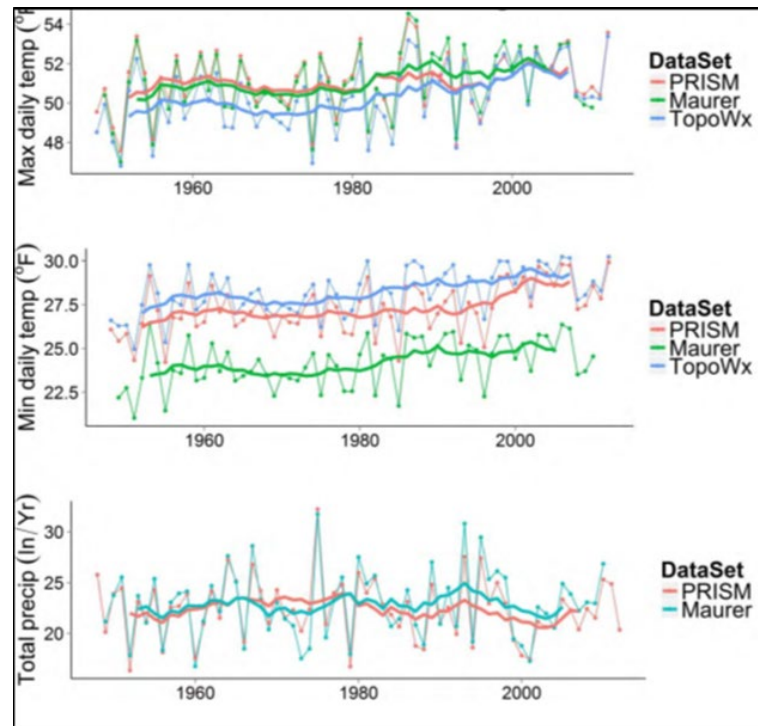
Recent climate cycles can be demonstrated by variations in the Pacific Decadal Oscillation, as shown in Figure 53. The early 1900's was a relatively normalized period where warm and cool years were relatively equally represented and fluctuations fairly low. The following period until the 1940's was dominated by warm conditions, while the period from about 1950 to 1980 was dominated by cool conditions. During this cool period, ecological disturbances such as wildfire affected a relatively small area, although this was also influenced by human actions such as fire suppression and livestock grazing. Since the 1980's, the Northern Region and the HLC NF have experienced a warm Pacific Decadal Oscillation cycle, along with increased extent and frequency of disturbances including wildfire and insect outbreaks.



**Figure 53. Pacific Decadal Oscillation index values from 1900 to 2017.**

Source: Joint Institute for the Study of the Atmosphere and Ocean, <http://research.jisao.washington.edu/pdo/>

Other climate data shows trends for temperature and precipitation over the recent historical period. In the Eastern Rockies subregion, the Northern Rockies Adaptation Partnership found that from 1895 to 2012, the annual mean monthly maximum temperature increased by about 2.2 degrees Fahrenheit, while the annual mean monthly maximum temperature increased by about 1.8 degrees Fahrenheit with little to no change in annual mean monthly precipitation (Halofsky et al., 2018a) (Figure 54). Current climate conditions in this subregion include an annual mean monthly maximum temperature between 53 and 54 degrees Fahrenheit; an annual mean monthly minimum temperature around 30 degrees Fahrenheit; and an annual mean monthly precipitation just over 2 inches.



**Figure 54. Annual historical mean monthly maximum temperature, annual mean monthly minimum temperature, and total annual precipitation for the NRAP Eastern Subregion**

Halofsky et al 2018; data is from monthly gridded PRISM, Maurer and TopoWx for 1949 to 2010. The heavy lines are the 10-year rolling average which show short-term trends.

## Forest Carbon

Forests are dynamic systems that naturally undergo ebbs and flows in carbon storage and emissions as trees establish and grow, die with age or disturbances, and re-establish and regrow. Through photosynthesis, growing plants remove CO<sub>2</sub> from the atmosphere and store it in forest biomass, such as in plant stems, branches, foliage, and roots. Some of this organic material is eventually stored in forest soils through biotic and abiotic processes (Ryan et al., 2010). Carbon can also be transferred and stored outside of the forest ecosystem in the form of wood products, further influencing the amount of carbon entering the atmosphere (Gustavsson et al., 2006; Skog et al., 2014). Many management activities initially remove carbon from the forest ecosystem, but they can also result in long-term maintenance or increases in forest carbon uptake and storage by improving forest health and resilience to various types of stressors (McKinley et al., 2011).

The carbon legacy of the HLC NF is tied to the history of Euro-American settlement, land management, and disturbances. Wildfire is the most influential disturbance on the HLC NF, as lightning storms are common. Coincident with a warm dry climate period, numerous reports indicate that large acreages on the HLC NF burned in the late 1800's. Subsequent fire suppression efforts along with cooler, wetter climate conditions and grazing uses contributed to an era of fire exclusion that was prominent until the 1980's. At that point, warmer and drier conditions began to prevail, and along with a build-up of fuels in some areas contributed to an increase in the acreages burned. Insect and diseases also historically played an important role in shaping vegetation. A recent mountain pine beetle outbreak impacted the majority of pine forests across the HLC NF (Milburn, 2015). Human activities associated with settlement, such as urbanization, mining, logging, and grazing began in the mid to late 1800's. Much of the accessible material was used for rail ties or cordwood, and extensive mining resulted in an ongoing demand for timber. To a lesser extent, modern vegetation management (since 1940) has also occurred.

Carbon stocks in the Helena NF decreased from 56.7±7.5 teragrams of carbon (Tg C) in 1990 to 48.9±7.8 Tg C in 2013, a 14 percent decrease in carbon stocks over this period (Figure 55). On the Lewis and Clark NF, carbon stocks decreased from 97.3±9.2 Tg C in 1990 to 94.9±8.9 Tg C in 2013, a 2.4 decrease. For context, 91 Tg C is approximately equivalent to the emissions from 115 million passenger vehicles in a year.<sup>1</sup>

<sup>1</sup> This report uses carbon mass, not CO<sub>2</sub> mass, because carbon is a standard unit and can easily be converted to any other unit. To convert carbon mass to CO<sub>2</sub> mass, multiply by 3.67 to account for the mass of the O<sub>2</sub>.

1,000 teragrams (Tg) = 1 petagram (Pg)

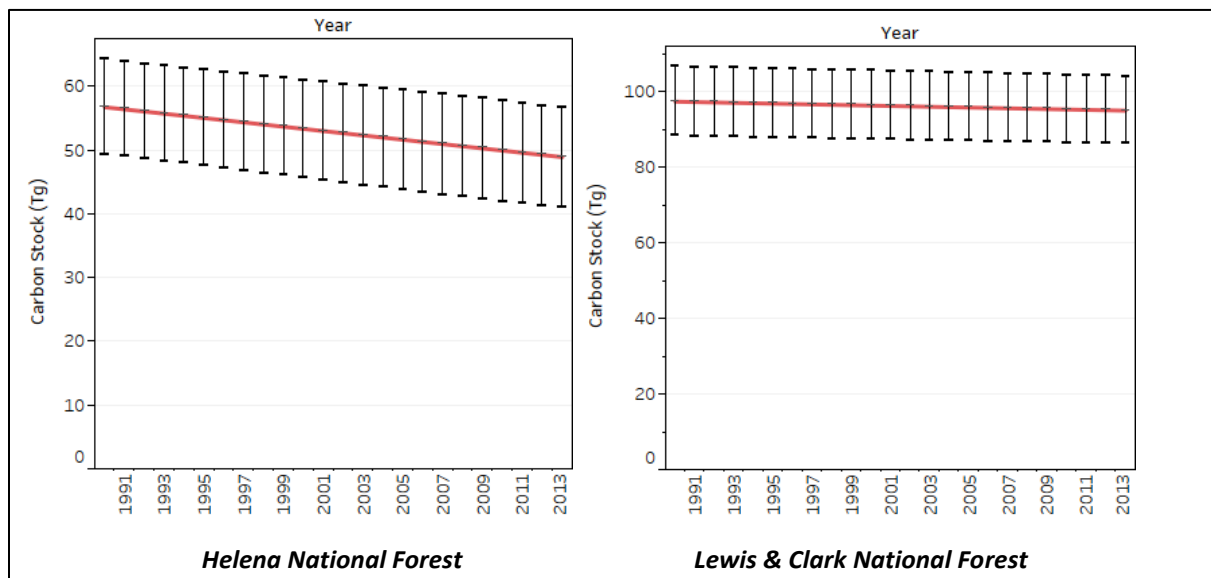
1,000 teragrams = 1 billion metric tonnes

1,000 teragrams = 1 gigatonne

1 teragram = 1 million metric tonnes

1 megagram (Mg) = 1 metric tonne = 3.67 tonnes CO<sub>2</sub> mass

A typical passenger vehicle emits about 4.6 tonnes CO<sub>2</sub> a year



**Figure 55. Total forest carbon stocks (Tg) from 1990 to 2013 for the HLC NF**

Bounded by 95% confidence intervals; estimated using the CCT model

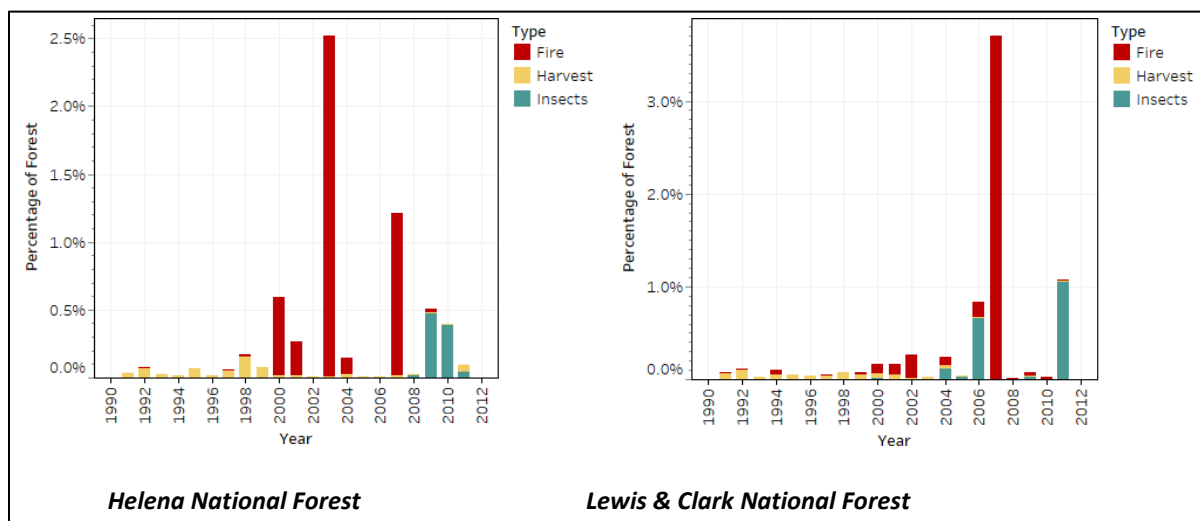
The decrease in storage indicates that the negative impacts on carbon stocks caused by disturbances and recent climate conditions have exceeded forest growth. Over half of the stands in the HLC NF are middle-aged and older (greater than 80 years), although there has also been a pulse of new forest establishment following large wildfires in the early 2000’s. If the Forest continues on this aging trajectory, the pulse of middle-aged stands will reach a slower growth stage in coming years and decades, potentially causing the rate carbon accumulation to decline. However, the pulse of young stands will also be moving into a maximum productivity stage, which may offset the declines in the middle-aged stands to a degree.

According to satellite imagery, wildfire has been the dominant disturbance type on the HLC NF from 1990 to 2011 (Figure 56). However, wildfire affected on average less than 1 percent of the HLC NF forested area annually (about 2,300 ha per year), though there were several large fire years (e.g. 2003, 2007). Likewise

carbon losses from the forest ecosystem associated with detected wildfires have also been relatively small, with nonsoil losses from 1990 to 2011 totaling 2.15 Mg C per ha on the Helena NF, and 1.89 Mg C per ha on the Lewis and Clark NF (Figure 57), or about 2.11 and 1.97 percent respectively of nonsoil carbon stocks (Birdsey et al., 2019). Given that the Helena and Lewis and Clark NFs contained 358,549 and 710,449 ha of forested land in 2011 respectively, nonsoil carbon losses from fire have been about 103,000 Mg C per year (0.103 Tg C yr<sup>-1</sup>).

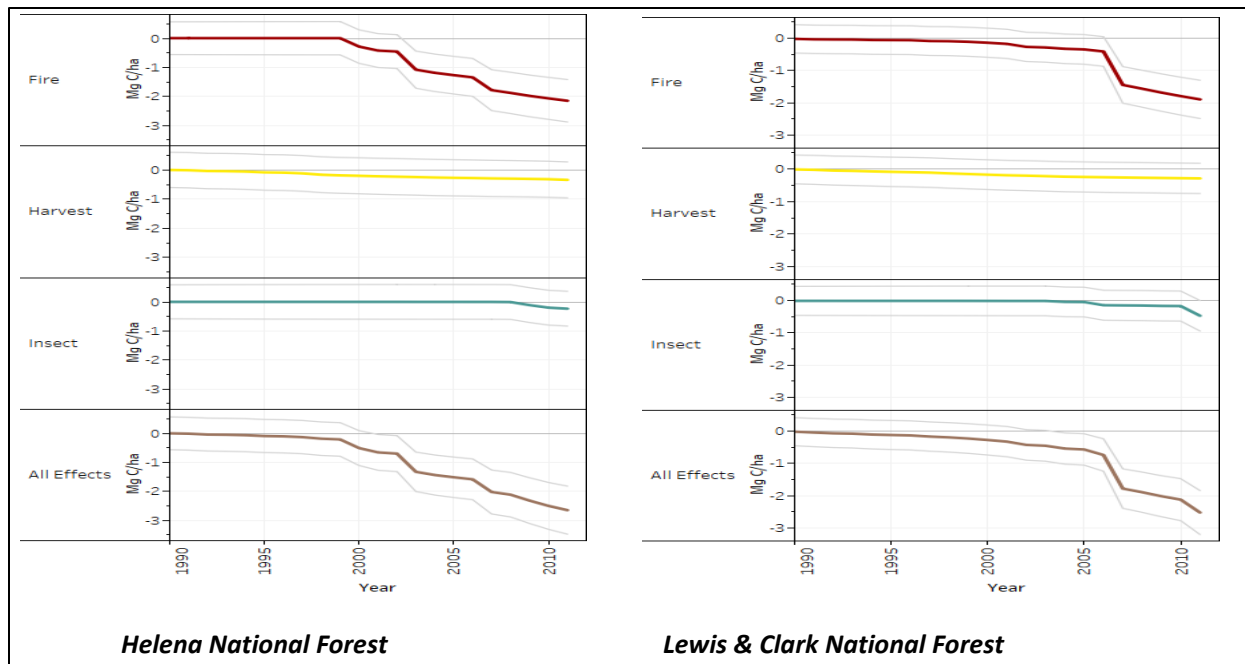
Insects are the second-most prominent disturbance process, which affected on average 0.005 and 0.09 percent of forested area annually (about 165 and 630 ha) respectively on the on the Helena and Lewis and Clark NFs from 1990 to 2011 (Figure 56). Some insect damage may have been undetected because it did not cause a change in canopy cover. Overall, insect affects detected over this 21-year period resulted in the loss of less than 0.5 Mg C per ha (Figure 57) (less than 0.5 percent) of nonsoil carbon on both the Helena and Lewis and Clark NFs. This is equivalent to an estimated loss of about 20,000 Mg C per year, a small fraction of the total carbon stocks on the HLC NF. The impacts of the widespread mountain pine beetle outbreak (2006-2012) may not be entirely reflected in the data sources used in this analysis.

Compared to natural disturbances, harvests have been minor in the Helena and Lewis and Clark NFs, affecting 0.7 percent of each Forest, or about 2,500 and 4,500 ha, respectively. Overall, harvests detected over this 21-year period resulted in the loss of less than 0.3 Mg C per ha (Figure 57) (less than 0.5 percent) of nonsoil carbon on both the Helena and Lewis and Clark NFs. This is equivalent to an estimated removal of about 15,000 Mg C per year from the forest ecosystem. These estimates do not account for continued storage of harvested carbon in wood products or the effect of substitution.



**Figure 56. Percentage of forest disturbed from 1990 to 2011 by disturbance type and magnitude (change in canopy cover)**

Estimated using annual disturbance maps derived from Landsat satellite imagery



**Figure 57. Lost potential storage of carbon (megagrams) as a result of disturbance for the period 1990-2011**

The zero line represents a hypothetical undisturbed scenario. Gray lines indicate 95% confidence intervals. Estimated using the ForCaMF model.

Modeled estimates suggest that overall nitrogen deposition has had a positive effect on carbon accumulation in the HLC NF. Like CO<sub>2</sub>, the actual magnitude of this effect remains uncertain. Elevated nitrogen deposition can also decrease growth in some species for a variety of reasons, such as leaching of base cations in the soil, increased vulnerability to secondary stressors, and suppression by more competitive species (Pardo, Robin-Abbott, & Driscoll, 2011). The InTEC model simulated that rates of carbon accumulation associated with nitrogen deposition decreased as deposition rates declined. Overall, the InTEC model suggests that CO<sub>2</sub> and nitrogen fertilization only partially offset the declines in carbon accumulation associated with historical disturbance, aging, and regrowth, and climate on the HLC NF.

### 3.30.5 Environmental consequences

#### Effects common to all alternatives

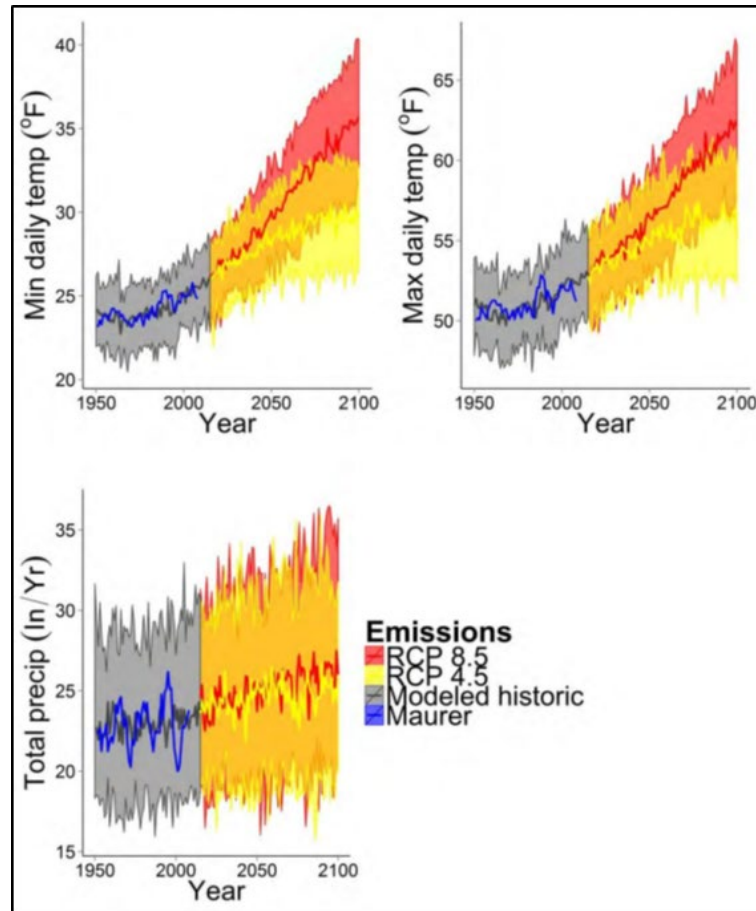
##### *Climate and Climate Change*

Under all alternatives, natural variation in climate will continue, coupled with the effects of anthropogenic influences. Different climate models project differing rates of change in temperature and precipitation because they operate at different scales, have different climate sensitivities, and incorporate feedbacks differently. However, the climate models are unanimous in projecting increasing average annual temperatures over the coming decades. The Northern Rockies Adaptation Partnership found that:

*“Global climate models project that the Earth’s current warming trend will continue throughout the 21st century in the Northern Rockies. Compared to observed historical temperature, average warming across the five NRAP subregions is projected to be about 4 to 5 °F by 2050, depending on greenhouse gas emissions. Precipitation may increase slightly in the winter, although the magnitude is uncertain. Climatic extremes are difficult to project, but they will probably be more common, driving biophysical changes in terrestrial and*

*aquatic ecosystems. Droughts of increasing frequency and magnitude are expected in the future, promoting an increase in wildfire, insect outbreaks, and nonnative species. These periodic disturbances, will rapidly alter productivity and structure of vegetation, potentially altering the distribution and abundance of dominant plant species and animal habitat.” (Halofsky et al., 2018a)*

Figure 58 displays the climate model projections for temperature and precipitation in the eastern region of the Northern Rockies Adaptation Partnership.



**Figure 58. Climate model projections for temperature and precipitation in the eastern region of the Northern Rockies Adaptation Partnership**

Historical modeled and projected annual mean monthly maximum temperature, annual mean monthly minimum temperature, and total annual precipitation - Eastern subregion. From Halofsky et al 2018. Based on RCP 4.5 and RCP 8.5 emission scenarios, CMIP5. Historic modeled results are indicated in gray, projections in colors. The 5th and 95th percent quantiles for all models are shown by the shaded area. The ensemble median is illustrated by the gray, red, or yellow heavy line; the blue heavy line is the gridded historical observed data from Mauer et al 2002.

The influence of future climate spans across all resources. Some key relationships include the following, from Halofsky and others (2018) and other sources as noted.

- Decreasing snowpack and declining summer flows will alter timing and availability of water.
- Declining summer low flows will affect water availability during late summer.
- Decreased snowpack in combination with higher air temperature and increased wildfire will increase stream temperatures and reduce the vigor of cold-water fish species.

- Projected changes to runoff timing will be most pronounced in the Rocky Mountains; changes in center of mass will be as much as 20 to 40 days in many streams (Stewart, Cayan, & Dettinger, 2004). Monitoring of the timing of snow melt discharge center of mass has seen a shift to as late June in the Rocky Mountains, and a 50-year record has shown a 15-day early runoff trend along the Front Range (ibid).
- Declining summer water flows may result in some communities experiencing summer water shortages. Water quality will decrease in some locations if wildfires and floods increase.
- Increasing air temperature, through its influence on soil moisture, will cause gradual changes in the abundance and distribution of tree, shrub, and grass species, with more drought tolerant species becoming more competitive. The earliest changes will be at ecotones.
- Natural disturbance will be the primary facilitator of vegetation change, and future forest landscapes may be dominated by younger age classes and smaller trees.
- High-elevation forests will be especially vulnerable if disturbance frequency increases.
- As wildfires and insect outbreaks become more common, the supply of timber and other forest products could become less reliable.
- A longer growing season will increase productivity of rangeland types, and thus available forage for livestock, especially those dominated by grasses.
- Increasing wildfire frequency and extent will be damaging for big sagebrush and other shrub species that are readily killed by fire. In montane grasslands, wildfire may kill Douglas-fir and other species that have recently established through fire exclusion.
- Habitat for mammals that depend on high-elevation, snowy environments for predators and prey is expected to deteriorate as snowpack decreases.
- Animal species that are highly dependent on a narrow range of habitat (pygmy rabbit, Brewer's sparrow, greater sage-grouse,) will be vulnerable if habitat decreases from increased disturbance.
- Animal species that are mobile or respond well to disturbance and habitat patchiness (deer, elk) will be resilient to a warmer climate.
- Some amphibian species may be affected by pathogens that are favored by a warmer climate.
- A warmer climate will generally improve opportunities for warm-weather recreation because it will create a longer time during which these activities are possible. Conversely, a warmer climate will reduce opportunities for snow-based, winter activities.
- Recreationists may seek more water-based activities to seek refuge from hotter summer weather.
- Viewsheds and air quality will be negatively affected by more wildfires and longer pollen seasons.
- Regulation of soil erosion will be decreased by agricultural expansion, spread of nonnative plants, and increased frequency of wildfire and floods.
- Carbon sequestration will be increasingly difficult if disturbances increase as expected.
- Climate-induced changes in habitats will affect abundance of culturally-valued plants and animals.

### *Forest Carbon*

In a global atmospheric CO<sub>2</sub> context, even the maximum potential management levels described by the alternatives would have a negligible impact on national and global emissions and on forest carbon stocks, as described below. As in this case, when impacts on carbon emissions (and carbon stocks) are small, a quantitative analysis of carbon effects is not warranted and thus is not meaningful for a reasoned choice among alternatives (U.S. Department of Agriculture, Forest Service, 2009a). Although advances in research have helped to account for and document the relationship between GHG and global climate change, it remains difficult to reliably simulate observed temperature changes and distinguish between natural or human causes at smaller than continental scales (Intergovernmental Panel on Climate Change, 2007b).



Even more difficult is the ability to quantify potential carbon consequences of management alternatives in the future due to potential variability in future conditions and the stochastic nature of disturbances. The result of such uncertainty is often a very low signal-to-noise ratio: small differences in carbon impacts among management alternatives, coupled with high uncertainty in carbon stock estimates, make the detection of statistically meaningful differences among alternatives highly unlikely.

### **Potential management effects**

Many of the management activities allowed by the Plan under all alternatives, other than reforestation, would initially directly reduce carbon stocks on the forest, though minimally. However, this initial effect would be mitigated or even reversed with time, reducing the potential for negative indirect and cumulative effects. These short-term losses and emissions are small relative to both the total carbon stocks on the forest and national and global emissions. Further, management activities would generally maintain and improve forest health and supply wood for forest products, thus having positive indirect effects on carbon storage. The HLC NF would continue to be managed to maintain forests as forests and the many ecosystem services and co-benefits the forests provide, including carbon uptake and storage.

Management activities proposed in the land management plan revision for HLC NF would have a negligible influence on the nonforest ecosystem carbon stocks and GHG emissions on the Forest. In addition, GHG emissions from the relatively small number of livestock maintained on the Forest are negligible relative to total GHG emissions in the United States and globally.

The action alternatives provide quantitative desired conditions for terrestrial ecosystems, and the standards and guidelines that help achieve or maintain those conditions; alternative A could also result in a similar management paradigm, even though desired conditions are not enumerated in the same fashion. Based on forest plan guidance, management activities under all alternatives would help maintain critical ecosystem functions into the future, in part by balancing the maintenance of carbon stocks and rates of carbon uptake. The following management strategies are incorporated into forest plan direction under all alternatives that also influence carbon uptake and storage potential:

- Manipulate the forest to provide for a variety of forest structures and compositions to support wildlife habitat. This can cause a decline in carbon stocks in some cases (when promoting early seral stands or more open stands), but compared with older or more dense stands, doing so promotes relatively high rates of carbon uptake over time as forests regrow (Pregitzer & Euskirchen, 2004).
- Preserve, enhance or accelerate the development of large trees stands and structures, and old-growth conditions, to support higher carbon stocks in mature forests compared with younger stands (Harmon, Ferrell, & Franklin, 1990).
- Decrease forest densities and fuel conditions to reduce the risk of large, stand-replacing disturbance from insect, disease, and fire. Although this strategy initially reduces carbon stocks, it can lower risk for greater carbon stock losses and emissions in the future (Wiedinmyer & Hurteau, 2010).
- Ensure successful reforestation after harvest or mortality-inducing disturbances to ensure continued carbon uptake and storage (Intergovernmental Panel on Climate Change, 2014).
- Promote desired composition, structure, function, and pattern (ecological integrity) which will support long-term carbon uptake and storage in the face of changing environmental conditions (Millar, Stephenson, & Stephens, 2007).
- Use harvested wood for valuable and renewable products to store carbon over the long-term and substitute for energy-intensive materials or fuels, reducing the net carbon emissions into the atmosphere (Gustavsson et al., 2006; Lippke et al., 2011).

Each of the alternatives include the slightly different number of acres projected to be treated with fire and harvest; however, the values are similar and would have similar effects on carbon. Plan direction in all alternatives would support the HLC NF towards continued resilience at both the stand and landscape scales.

Alternative F is the preferred alternative, and therefore is evaluated here as an indicator of the level of influence of the alternatives on carbon dynamics. Refer to the terrestrial vegetation and timber analyses for full discussions of projected treatment areas under each action alternative.

The estimated treatment area for harvests and thinning under alternative F would average 986 ha (2,437 acres) per year depending on the decade, or about 0.1 percent of total forested area on the HLC NF. This is similar to the no-action alternative, and a threefold increase from the harvest levels recorded from 1990-2011 based on the Landsat satellite imagery (Figure 56). Assuming that the annual carbon impact also increases up to three times above past levels, harvest treatments under alternative F may result in a maximum removal of about 45,000 Mg of carbon per year (0.05 Tg C) from aboveground pools.

Alternative F also includes prescribed burning on an average of about 1,440 ha (3,565 acre) annually in forested vegetation types. These projected burning acres would result in a potential loss of about 64,500 Mg C of carbon annually (0.06 Tg C), as estimated from the historical analysis. However, the historical period mostly included wildfires which generally burn at higher severities and result in greater carbon losses than prescribed burns. By reducing hazardous fuels, prescribed burning up described in alternative F may indirectly reduce the risk of more severe wildfires and greater carbon losses in the future (Agee & Skinner, 2005; Wiedinmyer & Hurteau, 2010).

Considering the expected area treated with harvesting and prescribed fire in alternative F, the amount of carbon that might be removed is small relative to the approximately 110 million metric tonnes (0.11 Tg) of carbon stored in the forest ecosystem of HLC NF. With maximum intensification, potential management actions would affect up to 0.23 percent of the forested area and much less than 1 Tg C annually. The alternatives would not significantly, adversely, or permanently affect forest carbon storage, but would rather achieve a more resilient forest condition that would improve the ability of the HLC NF to maintain carbon stocks and enhance carbon uptake.

**Effects from forest plan components**

Forest plan components guide where certain activities may occur on the landscape; the effects of this activities is summarized in the section above. Collectively, plan components would result short term losses of carbon in some cases (e.g., allowing for vegetation treatments), and storage of carbon on the landscape in some cases (e.g., old growth and riparian plan components), but generally would result in maintaining the capacity of the landscape to sequester carbon by managing for native vegetation and natural disturbance processes. FW-CARB-DC-01 specifically points to the desire to sustain carbon sequestration storage and potential, through resilient forest conditions.

**Effects common to all action alternatives**

All action alternatives contain one plan component specific to carbon storage and sequestration, as described in Table 284. By including this plan component, the action alternatives recognize and would more explicitly provide for carbon storage and sequestration than alternative A.

**Table 284. Plan components for carbon storage and sequestration – all action alternatives**

Plan Component(s)	Summary of expected effects
FW-CARB-DC-01	This desired condition emphasizes the importance of forest resilience and their ability to store and sequester carbon in the long term; it is complementary to many other plan components that would guide management to provide forest resilience (e.g., terrestrial vegetation and wildlife plan components).

Although the action alternatives vary in the expected levels of vegetation management, these differences are negligible in terms of the potential for forests to store and sequester carbon; see the discussion for effects common to all alternatives.

**Alternative A, no action**

See effects common to all alternatives. The 1986 Forest Plans do not contain any plan components related to climate change or carbon storage and sequestration.

**Cumulative effects**

Climate change is a global phenomenon, because major greenhouse gases mix well throughout the planet’s lower atmosphere. Estimated emissions of GHGs in 2010 were 13,336 ± 1,227 teragrams carbon globally (Intergovernmental Panel on Climate Change, 2014) and 1,881 teragrams carbon nationally (U.S. Environmental Protection Agency, 2015). All of the alternatives are projected to contribute negligibly to overall GHG emissions. Furthermore, it is difficult and highly uncertain to ascertain the indirect effects of emission from multiple, generally small projects that make up these alternatives on global climate. Management actions are directed at a very small percentage of the total forest land on the HLC NF; even in the near-term, these alternatives would have a minimal direct effect on carbon emissions and carbon stocks relative to total carbon stocks in the HLC NF. Because the potential direct and indirect effects of alternatives would be negligible, the contribution of the plan’s proposed actions to cumulative effects on global atmospheric GHG concentrations and climate change would also be negligible.

Portions of the HLC NF adjoin other NFs, each having its own forest plan. The HLC NF is also intermixed with lands of other ownerships, including private lands, other federal lands, and state lands. Some GAs contain inholdings of such lands, while others are more un-fragmented. As described in the Terrestrial Vegetation section, land management plans for state and federal agencies would broadly provide for resilient forest conditions and not reduce the potential of lands to store and sequester carbon; as such, they would be complementary to the 2021 Land Management Plan. Private lands would not necessarily be managed for native vegetation; for example, potential urban developments could reduce carbon storage potential on some of these lands. The cumulative effects of these plans in conjunction with the 2021 Land Management Plan are summarized in Table 285.

**Table 285. Cumulative effects to carbon and climate from other resource management plans**

Resource plan	Summary of effects
Forest plans of adjacent national forests	The Flathead, Lolo, Beaverhead-Deerlodge, and Custer-Gallatin NFs are adjacent to the HLC NF and share boundaries on specific GAs (Rocky Mountain Range, Upper Blackfoot, Divide, Elkhorns, and Crazyes). The Flathead and Custer-Gallatin are in forest plan revision under the 2012 Planning Rule. The Beaverhead-Deerlodge NF is guided by a 2009 forest plan developed under the 1982 rule. The Lolo is guided by a 1986 forest plan. All of the forest plans contain plan direction related to maintaining healthy, natural vegetation. Therefore, these plans are consistent with the 2021 Land Management Plan and contribute to maintaining the carbon sequestration potential on NFS lands.
Montana State Forest Action Plan (2020)	This action plan includes specific considerations and strategies related to climate change, including promoting long term forest resilience, promoting carbon sequestration, and incorporating climate change considerations into planning. Many actions in the strategy would reduce carbon storage in the short term (e.g., removal of forest products) but improve long term resilience of native vegetation which would protect the carbon sequestration potential in the long term; this is similar to the effects of actions that could occur under the 2021 Land Management Plan.
Bureau of Land Management resource management plans	The Butte, Missoula, and Lewistown field offices manage lands that are intermixed with the HLC NF. The Missoula area is currently in revision; the Lewistown plan was recently issued (2019). The Butte area is guided by a 2009 plan. While these plans generally do not contain direction specific to carbon or climate, they do contain components related to resiliency and sustainability of vegetation, which is compatible with the 2021 Land Management Plan and would contribute to maintaining the ability of lands to sequester carbon and be resilient to climate changes.

Resource plan	Summary of effects
County growth policies	In general, the county growth policies are silent on the issues of climate change and carbon sequestration. However, many of them include policies related to maintaining open spaces and healthy native vegetation. Although portions of county lands include emphasis on urban development and subsequent loss of carbon storage, such policies would mitigate the losses of native vegetation. There is nothing in the 2021 Land Management Plan related to climate and carbon that directly conflicts with county policies.
County wildfire protection plans	The county CWPPs do not generally address climate change or carbon sequestration issues, although they do promote the concepts of resilient vegetation and limiting hazardous fuels. These management strategies are similar to those allowed by the 2021 Land Management Plan, and where fuels are treated would have similar effects in relation to potential short term reductions in carbon storage but long term resilience of native vegetation which protects the carbon sequestration potential of these lands
2018 Blackfeet Wildland Fire Management Plan	This plan recognizes the role climate has in wildland fire size, intensity, and frequency, in a manner consistent with the HLC NF analysis. The Blackfeet plan encourages hazardous fuels treatments such as those also allowed on NFS lands by the 2021 Land Management Plan. There is nothing in the 2021 Land Management Plan that conflicts with the management direction in this plan.
Bureau of Reclamation Canyon Ferry Resource Management Plan and Shoreline Plan	The BOR RMP is silent on the topics of carbon sequestration and climate change. However, even taken cumulatively with the 2021 Land Management Plan, the management actions allowed in this plan would not be likely to have a measurable impact on climate change or carbon sequestration. The BOR Canyon Ferry Shoreline plan is primarily focused on the recreational uses along Canyon Ferry reservoir, in addition to a wildlife management area. There is nothing in the 2021 Land Management Plan related to carbon and climate that conflicts with either of these plans.
Montana’s State Wildlife Action Plan	This plan acknowledges the threats of climate change to various community types, and includes actions related to continued monitoring and evaluation of available climate information. The threats and conservation actions described in this plan are compatible with the FEIS analysis for the 2021 Land Management Plan.
2015 Montana State Water Plan	This plan notes the need to address the changing climate; the plan discusses the impacts of climate and drought as well as future water trends. This information is consistent with the information presented in the HLC NF FEIS.
Glacier NP General Management Plan	This plan does not specifically address carbon sequestration or climate change, although it promotes the preservation of ecological integrity in general. It would, therefore, be complementary to the 2021 Land Management Plan in the role of maintaining native vegetation and natural carbon sequestration cycles.
Montana NRCS Soil Health Strategy	This general soil health strategy is focused on soil conditions in agricultural lands. To the extent that healthy soil conditions are promoted, so too is the carbon sequestration potential in the soil which is a key carbon pool. This would complement the 2021 Land Management Plan by helping maintain natural carbon cycles. There is nothing in the 2021 Land Management Plan that conflicts with the concepts presented in the soil strategy.
Montana Air National Guard Integrated Natural Resources Management Plan for Limestone Hills Training Area	This plan describes the climate of the training area and promotes healthy and resilient vegetation. It also has a goal to assess and analyze the potential impacts of climate change on the military mission, including a vulnerability assessment. Such an analysis would directly complement the 2021 Land Management Plan for this area (in the Elkhorns GA).
City of Helena Montana Parks, Recreation and Open Space Plan (2010)	This plan is relevant to an area that lies adjacent to national forest system lands in the Divide GA, in proximity to the City of Helena. The plan emphasizes forest management for the purposes of resiliency to wildfire and insects. The direction in this plan would be generally complementary and additive to management on HLC NFS lands, with actions that may reduce carbon storage in the short term but enhance long term storage potential by increasing the resilience of forests.

## Conclusions

A large body of science agrees that future climate conditions will include increasing average annual temperatures over the coming decades, which will have impacts to natural resources.

The proposed activities under all alternatives generally maintain and improve forest health and resiliency to disturbances. Potential negative effects may be mitigated and completely reversed with time as the forests regrow. Over the longer term, the activities allowed by the Plan are likely to increase carbon storage and reduce emissions, by reducing disturbance risk and storing carbon in wood products. The management mechanisms applied in all alternatives are consistent with internationally recognized climate change adaptation and mitigation practices identified by the IPCC (Intergovernment Panel on Climate Change (IPCC), 2000; Intergovernmental Panel on Climate Change, 2007a, 2007b).

Carbon stocks on the HLC NF would likely continue to increase or remain stable under all alternatives in the foreseeable future. Natural ecosystem processes, including forest growth (succession) and small-scale disturbances (e.g., fire, insects, harvests) would continue to influence carbon stocks and emissions, but they are not expected to substantially change current trends in carbon over the span of the Plan. All alternatives would preserve existing forest lands and forests by improving forest conditions and retaining forest characteristics by maintaining current land use. Given the likely changes in land use in coming decades on adjacent land ownerships, this is a critical goal.

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# Glossary

## A

**activity area** a land area affected by a management activity to which soil quality standards are applied. An activity area must be feasible to monitor and includes harvest units within timber sale areas, prescribed burn areas, grazing areas or pastures within range allotments, riparian areas, recreation areas, and alpine areas. Temporary roads, skid trails, and landings are considered to be part of an activity area.

**adaptive management** the general framework encompassing the three phases of planning: assessment, plan development, and monitoring (36 Code of Federal Regulations 219.5). This framework supports decision-making that meets management objectives while simultaneously accruing information to improve future management by adjusting the plan or plan implementation. Adaptive management is a structured, cyclical process for planning and decision-making in the face of uncertainty and changing conditions with feedback from monitoring, which includes using the planning process to actively test assumptions, track relevant conditions over time, and measure management effectiveness.

**adfluvial** the migration of fish between lakes to rivers.

**administrative site** a location or facility constructed for use primarily by government employees to facilitate the administration and management of public lands. Examples on NFS lands include, but are not limited to, ranger stations, warehouses, and guard stations.

**administrative use** a generic term for authorized agency activity. Specifically, in the portion of the NCDE for grizzly bears mapped as the primary conservation area, motorized use of roads closed to the public is permitted for Federal agency personnel or other personnel authorized to perform duties by appropriate agency officials as long as doing so does not exceed either six trips (three round trips) per week or one 30-day unlimited use period during the non-denning season (see also non-denning season).

**aerial retardant avoidance area** mapped areas (interactive map online at <https://www.fs.fed.us/fire/retardant/index.html> ) that are to be avoided during applications of fire retardant; including: habitat for threatened, endanger, proposed, candidate or sensitive species and all waterways. This national direction is mandatory and would be implemented except in cases where human life or public safety is threatened and retardant use within avoidance areas could be reasonably expected to alleviate that threat.

**aircraft** an airplane, helicopter, or other machine capable of flight.

**airstrip** an area of land that is used as a runway for aircraft to take off and land.

**alpine** high elevation ecosystem dominated by grasses and low-lying shrubs.

**animal month** a month's tenure upon range by one animal. Must specify kind and class. Not synonymous with animal-unit month.

**animal unit** considered to be one mature cow of approximately 1,000 pounds, either dry or with calf up to 6 months of age, or their equivalent, based on a standardized amount of forage consumed.

**animal unit month (AUM)** the amount of dry forage required by one animal unit for one month based on a forage allowance of 26 pounds per day.

**aquifer** an underground layer of water-bearing permeable rock, rock fractures or unconsolidated material (gravel, sand or silt) from which groundwater can be extracted using a water well.

**aquatic organism passage** a passage that provides the ability for fish and other aquatic creatures to move up and downstream under a road.

**at-risk community** a community located in the wildland urban interface or a group of homes and other structures with basic infrastructure and services within or adjacent to federal land in which conditions are conducive to a large-scale wildland fire disturbance event, and for which a significant threat to human life or property exists as a result of a wildland fire disturbance event.

**attractant** a nourishing substance, which includes human food or drink (canned, solid or liquid), livestock feed (except baled or cubed hay without additives), pet food, and garbage (from the Northern Continental Divide Ecosystem Food/Wildlife Attractant Storage Order).

## B

**baseline** the environmental conditions at a specific point in time. The baseline for the NCDE is defined as conditions as of December 31, 2011, as modified by changes in numbers that were evaluated and found to be acceptable through the Endangered Species Act Section 7 consultation with USFWS while the grizzly bear was listed as threatened. The baseline will be updated to reflect changes allowed under the standards and guidelines.

**bear management subunit** an area of a bear management unit, in the portion of the NCDE for grizzly bears mapped as the primary conservation area, representing the approximate size of an average annual female grizzly bear home range [e.g., 31-68 square miles, (Mace & Roberts, 2012)].

**bear management unit** an area about 400 square miles, in the portion of the NCDE for grizzly bears mapped as the primary conservation area, that meets yearlong habitat needs of both male and female grizzly bears.

**best management practice** the method(s), measure(s), or practice(s) selected by an agency to meet its nonpoint source control needs. Best management practices include but are not limited to structural and nonstructural controls and operation and maintenance procedures. Best management practices can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters (36 Code of Federal Regulations 219.19).

**big game** the term ‘big game’ refers to the ungulate species found on the HLC: deer (both white-tailed and mule deer), elk, moose, bighorn sheep, mountain goat, and pronghorn. The term is used to indicate all or a portion of that suite of species.

**biodiversity** the variety and abundance of plants, animals, and other living organisms and the ecosystem processes, functions, and structures that sustain them. Biodiversity includes the relative complexity of species and communities across the landscape at a variety of scales, connected in a way that provides for the genetic diversity to sustain species over the long-term.

**biological soil crust** a complex mosaic of cyanobacteria, green algae, lichens, mosses, microfungi, and other bacteria occurring on the soil surface in open spaces within arid and semiarid systems.

**biophysical settings** a grouping of potential vegetation types based on broad climatic and site conditions, such as temperature and moisture gradients. Also see potential vegetation types.

**board foot** a unit of measurement represented by a board one foot square and one inch thick.

**boneyard** an established site that is used repeatedly by a grazing permittee for disposing of entire animal carcasses.

**boreal forest (lynx)** a forest type to which lynx and snowshoe hares are strongly associated. The predominant vegetation of boreal forest is conifer trees, primarily species of spruce (*Picea* spp.) and fir (*Abies* spp.) (USFWS Critical Habitat Final Rule 2009).

**broadcast burn** a management treatment where a prescribed fire is allowed to burn over a designated area within well-defined boundaries. A broadcast burn is used for reduction of fuel hazard, as a resource management treatment, or both.

## C

**candidate species** a status (1) for USFWS candidate species, a species for which the U.S. Fish and Wildlife Service possesses sufficient information on vulnerability and threats to support a proposal to list as endangered or threatened, but for which no proposed rule has yet been published by the U.S. Fish and Wildlife Service; (2) for National Marine Fisheries Service candidate species, a species that is: (i) the subject of a petition to list and for which the National Marine Fisheries Service has determined that listing may be warranted, pursuant to section 4(b)(3)(A) of the Endangered Species Act (16 United States Code (U.S.C.) 1533(b)(3)(A)), or (ii) not the subject of a petition but for which the National Marine Fisheries Service has announced in the Federal Register the initiation of a status review.

**canopy** the forest cover of branches and foliage formed by tree crowns.

**canopy base height** the lowest height above the ground at which there is a sufficient amount of canopy fuel to propagate fire vertically into the canopy; canopy base height is an effective value that incorporates ladder fuels such as shrubs and understory trees.

**canopy fuel** the live and dead foliage, live and dead branches, and lichen of trees and tall shrubs that lie above the surface fuels.

**capability** the potential of an area of land and/or water to produce resources, supply goods and services, and allow resource uses under a specified set of management practices and at a given level of management intensity. Capability depends upon current conditions and site conditions (climate, slope, landform, soils, and geology), as well as the application of management practices (silviculture systems, or protection from fires, insects, and disease).

**capacity (of developed recreation sites within the NCDE primary conservation area)** the number of sites available for overnight use (e.g., the number of sites in a campground; the number of rooms available for lodging (as a commercial rental); or the number of cabins, bunkhouses, or recreation residences managed under a special-use permit).

**carbon pool** an area that contains an accumulation of carbon or carbon-bearing compounds or having the potential to accumulate such substances. May include live and dead material, soil material, and harvested wood products.

**carbon stock** the amount or quantity contained in the inventory of a carbon pool.

**clearcut** a harvest technique: 1) a stand in which essentially all trees have been removed in one operation. Note: depending on management objectives, a clearcut may or may not have reserve trees left

to attain goals other than regeneration. 2). A regeneration or harvest method that removes essentially all trees in a stand (synonym is clearcutting). Also see regeneration method.

**climate change adaptation** an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. This adaptation includes initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects. Adaptation strategies include the following: building resistance to climate-related stressors; increasing ecosystem resilience by minimizing the severity of climate change impacts, reducing the vulnerability and/or increasing the adaptive capacity of ecosystem elements; facilitating ecological transitions in response to changing environmental conditions.

**climax** the final stage of succession in a plant community. A relatively stable condition where plant species on the site are able to perpetuate themselves indefinitely in the absence of disturbance.

**coarse woody debris** a piece or pieces of larger sized dead woody material (for example, dead boles, limbs, and large root masses) on the ground or in streams. Minimum size to be defined as “coarse” is generally 3 inches diameter.

**commercial thinning** a treatment that selectively removes trees large enough to be sold as products, such as sawlogs, poles or fence posts, from an overstocked stand. This treatment is usually carried out to improve the health and growth rate of the remaining crop trees, or to reduce fire hazard.

**commercial use/activity** a use or activity on NFS lands (a) where an entry or participation fee is charged, or (b) where the primary purpose is the sale of a good or service, and in either case, regardless of whether the use or activity is intended to produce a profit (36 Code of Federal Regulations 251.51).

**community wildfire protection plans** strategic plans developed by communities to address issues such as wildfire response, hazard mitigation, community preparedness, or structure protection—or all of the above. The Healthy Forests Restoration Act (HFRA) in 2003 includes statutory incentives for the US Forest Service (USFS) and the Bureau of Land Management (BLM) to give consideration to the priorities of local communities as they develop and implement forest management and hazardous fuel reduction projects. In order for a community to take full advantage of this opportunity, it must prepare a Community Wildfire Protection Plan (CWPP).

**composition** the biological elements within the different levels of biological organization, from genes and species to communities and ecosystems.

**confidence interval** a range of values around the estimated mean that defines a specified probability that the value of a parameter lies within it.

**consultation** see interagency consultation.

**contemporary vegetation management challenges** issues with controlling, restoring or improving vegetation dynamics to achieve certain resource objectives. Some examples include but are not limited to such things as controlling invasive exotic weeds, reducing fire risk in the wildland-urban interface, and finding chemical-free ways to control weeds, etc.

**cohort** a group of trees developing after a single disturbance, commonly consisting of trees of similar age, although it can include a considerable range of tree ages of seedling origin and trees that predate the disturbance.

**connectivity** the ecological conditions that exist at several spatial and temporal scales that provides landscape linkages that permit the exchange of flow, sediments, and nutrients; the daily and seasonal movements of animals within home ranges; the dispersal and genetic interchange between populations; and the long distance range shifts of species, such as in response to climate change (36 Code of Federal Regulations 219.19). Connectivity needs vary by species.

**conservation** the protection, preservation, management, or restoration of natural environments, ecological communities, and species.

**consumptive water use** the act of removing water from an available supply and utilizing it in a manner that it is not returned to a waterbody.

**coppice** a forest regeneration method by which the majority of regeneration is from sprouts or root suckers. The suitable species on the HLC NF for this method is limited to aspen.

**cover** the elements of the environment used by an animal for hiding. Cover varies depending upon the species or the time of year and may include a variety of vegetation types as well as topography. The amount and quality of cover needed depends on the animal's size, mobility, and reluctance or willingness to venture into relatively open areas. Cover can occur as horizontal cover, which may provide security from disturbance by humans or predators, or thermal cover (often provided by vegetation canopy), which can help animals regulate body temperature during periods of extreme heat or cold.

**cover type** the vegetation composition of an area, described by the dominant plant species. Also see forest type.

**Cretaceous** a geologic period and system from  $145 \pm 4$  to 66 million years (Ma) ago.

**critical habitat** (for a threatened or endangered species) (1) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act (16 United States Code 1533), on which are found those physical or biological features (a) essential to the conservation of the species, and (b) which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act (16 USC 1533), upon a determination by the Secretary that such areas are essential for the conservation of the species. Endangered Species Act, sec. 3 (5)(A), (16 USC 1532 (3)(5)(A)). Critical habitat is designated through rulemaking by the Secretary of the Interior or Commerce. Endangered Species Act, sec. 4 (a)(3) and (b)(2) (16 United States Code 1533 (a)(3) and (b)(2)).

**crown** the part of a tree or other woody plant bearing live branches and foliage.

**culmination of mean annual increment of growth** see mean annual increment of growth.

## D

**decision document** a record of decision, decision notice, or decision memo (36 Code of Federal Regulations 220.3).

**dedicated skid trail** a pathway used repeated, and only, to move logs or trees from the stump to a landing, where they are processed and loaded onto trucks.

**deferred trail maintenance** the backlog of trails in need of maintenance.

**deleterious** having a harmful or injurious effect.

**demographic connectivity area** an area intended to allow female grizzly bear occupancy and potential dispersal beyond the NCDE to other recovery areas.

**den emergence time period** the time period in the spring when a grizzly bear emerges from its den and remains in the vicinity before moving to lower elevations. The den emergence time period occurs at the beginning of the non-denning season. Females with cubs usually emerge later and spend more time (a few days to a few weeks) near the den after emergence than do male bears.

**denning season** the typical time period during which most grizzly bears are hibernating in dens. Within the NCDE denning season is as follows:

- west of the Continental Divide: from December 1 through March 31.
- east of the Continental Divide: from December 1 through April 15.

**density (stand)** the number of trees growing in a given area usually expressed in terms of trees per acre.

**designated area** an area or feature identified and managed to maintain its unique special character or purpose; some categories of designated areas may be designated only by statute and some categories may be established administratively in the land management planning process or by other administrative processes of the federal executive branch; examples of statutorily designated areas are national heritage areas, national recreational areas, national scenic trails, wild and scenic rivers, wilderness areas, and wilderness study areas; examples of administratively designated areas are experimental forests, research natural areas, scenic byways, botanical areas, and significant caves.

**designated over-snow route** a course managed under permit or agreement or by the agency, where use is encouraged, either by on-the ground marking or by publication in brochures, recreation opportunity guides or maps (other than travel maps), or in electronic media produced or approved by the agency. The routes identified in outfitter and guide permits are designated by definition; groomed routes also are designated by definition.

**desired condition (DC)** a description of specific social, economic, and/or ecological characteristics of the plan area, or a portion of the plan area, toward which management of the land and resources should be directed. Also see chapter 1.

**desired plant community** the one species composition (of the many possible within any given ecological site or equivalent) that is most compatible with management objectives for a site. This decision depends on the relative value expected to be obtained from alternative land uses, as well as the feasibility of implementing actions required to change the present vegetation to a more desirable type. It is unlikely that the desired plant community would feature substandard levels of soil protection, biotic integrity and hydrologic function, because it is assumed that maintaining site potential should be an intrinsic goal of any management plan. Desired plant community is in essence the benchmark against which to compare existing vegetation and provides a system to evaluate the success of current practices in meeting management objectives. (Global Rangelands 2016).

**developed recreation site capacity within the NCDE primary conservation area** for purposes of implementing standard NCDE-STD-AR-05, developed recreation site capacity on NFS lands that are designed and managed for overnight use includes

- the number of camp sites available in a campground,
- the number of rooms available for lodging at a ski area or guest lodge,
- the maximum sleeping capacity of a cabin rental or bunkhouse that is available for overnight use by the public, and
- the maximum parking capacity at picnic areas, trailheads, or boat launches that are not closed to overnight use.

**developed recreation site within the NCDE primary conservation area** for purposes of implementing standard NCDE-STD-AR-05, developed recreation sites on NFS lands that are designed and managed for overnight use include campgrounds, lodging at ski areas, cabin rentals, huts, guest lodges, and recreation residences. This standard does not apply to dispersed recreation sites nor to developed recreation sites managed for day-use only (e.g., outfitter camps, roadside trail crossings or interpretive pull-outs; trailheads, picnic areas, or boat launches that are closed at night; and ski areas that do not have overnight lodging).

**diameter breast height (d.b.h.)** the diameter of a tree measured 4.5 feet above the ground on the uphill side of the tree, or diameter of a log measured 4.5 feet from the large end of the log.

**discretionary** the exploration and development of leasable mineral resources are discretionary activities, meaning that leasing them may or may not be allowed.

**dispersed recreation** an area in a national forest or national grassland with limited or no amenities provided for recreational users (36 CFR § 261.2).

**disturbance** an event that alters the structure, composition, or function of terrestrial or aquatic habitats; any relatively discrete event in time that disrupts ecosystem, watershed, community, or species population structure and/or function and changes resources, substrate availability, or the physical environment. Natural disturbances include, among others, drought, floods, wind, fires, wildlife grazing, and insects and pathogens; human-caused disturbances include actions such as timber harvest, livestock grazing, roads, and the introduction of exotic species.

**disturbance activities** activities which result in notable vegetation removal and/or soil disturbance (road construction, timber harvest, etc.).

**disturbance regime** a description of the characteristic types of disturbance on a given landscape; the frequency, severity, size, and distribution of these characteristic disturbance types, and their interactions. The natural pattern of periodic disturbances, such as fire or flooding.

**disturbance/displacement** the repeated avoidance of humans by a species by shifting its habitat use in space or time.

**driver (ecology)** see ecosystem driver.

**duff** the partially decayed organic matter on the forest floor.

## E

**early-seral/successional stage (forest)** the earliest stage in the sequence of plant communities that develop after a stand replacing disturbance, such as fire or regeneration harvest. On the forested communities of the HLC NF, this stage typically occurs in the period from 1 to 30 or 40 years after the disturbance, and is dominated by grass, forbs, shrubs, and seedling/sapling sized trees.

**early successional forest patches** specifically defined for modeling purposes as areas classified into the seedling/sapling size class (less than 5" diameter) and transitional areas reforesting following disturbance (these areas have little to no tree cover but are found on forested potential vegetation types).

**ecological condition** the biological and physical environment that can affect the diversity of plant and animal communities, the persistence of native species, and the productive capacity of ecological systems; ecological conditions include habitat and other influences on species and the environment; examples of

ecological conditions include the abundance and distribution of aquatic and terrestrial habitats, connectivity, roads and other structural developments, human uses, and invasive species.

**ecological integrity** the quality or condition of an ecosystem when its dominant ecological characteristics (for example, composition, structure, function, connectivity, and species composition and diversity) occur within the natural range of variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influence. The quality of a natural unmanaged or managed ecosystem in which the natural ecological processes are sustained, with genetic, species and ecosystem diversity assured for the future.

**ecological site** a distinctive kind of land with specific soil and physical characteristics that differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation, and in its ability to respond similarly to management actions and natural disturbances (NRCS, National Range and Pasture Handbook, December 2003).

**ecological sustainability** see sustainability.

**ecosystem** (36 Code of Federal Regulations 219.19) a spatially explicit, relatively homogeneous unit of the Earth that includes all interacting organisms and elements of the abiotic environment within its boundaries. The term ecosystem can be used at a variety of scales; for the forest plan, the ecosystem is referred to spatially at the forestwide and geographic area scales as well as within potential vegetation types. An ecosystem is commonly described in terms of its:

- composition: the biological elements within the different levels of biological organization, from genes and individual plant and animal species to communities (such as cover types).
- structure: the organization and physical arrangement of biological elements such as, snags and down woody debris, vertical (size class and structure class) and horizontal (density) distribution of vegetation, stream habitat complexity, landscape pattern, and connectivity.
- function: ecological processes that sustain composition and structure, such as energy flow, nutrient cycling and retention, soil development and retention, predation and herbivory, and natural disturbances such as wind, fire, and floods.
- connectivity: see connectivity.

**ecosystem driver** a natural or human-induced factor that directly or indirectly causes a change in an ecosystem. Examples include climate change, fire events, invasive species and flooding.

**ecosystem resilience** see resilience.

**ecosystem service** the benefit(s) people obtain from an ecosystem, including: (1) provisioning services, such as clean air and fresh water, energy, fuel, forage, fiber, and minerals; (2) regulating services, such as long-term storage of carbon; climate regulation; water filtration, purification, and storage; soil stabilization; flood control; and disease regulation; (3) supporting services, such as pollination, seed dispersal, soil formation, and nutrient cycling; and (4) cultural services, such as educational, aesthetic, spiritual and cultural heritage values, recreational experiences and tourism opportunities.

**ecosystem stressor** a factor that may directly or indirectly degrade or impair ecosystem composition, structure or ecological process in a manner that may impair its ecological integrity, such as an invasive species, loss of connectivity, or the disruption of a natural disturbance regime.

**ecotone** a zone of transition between two distinctly different plant communities, where they meet and integrate. It may be narrow or wide; local (between a field and forest) or regional (between forest and



grassland ecosystems); gradual or manifested as a sharp boundary line. This zone usually exhibits competition between organisms common to both communities. See also xeric ecotone.

**effective separation** spatial or temporal separation between wild sheep and domestic sheep or goats, resulting in minimal risk of contact and subsequent transmission of respiratory disease between animal groups (from WSWG, 2012).

**elk security** the protection inherent in any situation that allows elk to remain in a defined area despite an increase in stress or disturbance associated with the hunting season or other activities (Lyon and Christensen 1992).

**emergency situation** a circumstance on NFS lands for which immediate implementation of all or part of a decision is necessary for relief from hazards threatening human health and safety or natural resources on those NFS or adjacent lands or that would result in substantial loss of economic value to the Federal Government if implementation of the decision were delayed (must meet the requirements of 36 § CFR 218.21).

**endangered species** a species that the Secretary of the Interior or the Secretary of Commerce has determined is in danger of extinction throughout all or a significant portion of its range. Endangered species are identified by the Secretary of the Interior in accordance with the 1973 Endangered Species Act. Endangered species are listed at 50 Code of Federal Regulations sections 17.11, 17.12, and 224.101.

**environmental document** a written analysis that provides sufficient information for a responsible official to undertake an environmental review. Examples include: a categorical exclusion, an environmental assessment, and an environmental impact statement.

**epidemic (outbreak)** the rapid spread, growth, and development of pathogen or insect populations that affect large numbers of a host population throughout an area at the same time.

**evacuation route** roads and/or trails that would be used to evacuate the public during a natural disturbance event.

**even-aged stand** a stand of trees composed of a single age class (cohort). Usually trees in a single age class are within + 20 years of each other.

**even-aged system** a planned sequence of treatments designed to maintain and regenerate a stand with predominantly one age class. Treatments include clearcutting, seedtree, shelterwood, and coppice regeneration methods.

## F

**feed** any non-injurious, edible material having nutritive value when ingested.

**final regeneration harvest** the final timber harvest in a sequence of harvests designed to regenerate a timber stand or release a regenerated stand. A final regeneration harvest could be a clearcut, removal of a shelterwood or seedtree system, or a selectin cut.

**fire-adapted species** a plant type that has evolutionary adaptations to survive and thrive in an ecosystem where fire is a primary driver, including tree species that are termed fire-tolerant as well as trees and other plant species that have a myriad of other types of adaptations. Some examples of adaptations are the serotinous cones of lodgepole pine (which open only when heated in a fire); fast early tree growth for rapid site domination; rhizomatous (below ground) root systems or root crowns; seeds with hard, fire resistant seed-coats; or very lightweight, wind-dispersed seed (also see fire-tolerant tree species).

**fire control** see fire suppression.

**fire hazard** the potential fire behavior for a fuel type, regardless of the fuel type’s weather-influenced fuel moisture content or its resistance to fireline construction. Fire behavior assessment is based on physical fuel characteristics, such as fuel arrangement, fuel load, condition of herbaceous vegetation, and presence of elevated fuels.

**fire-intolerant tree species** a tree type that is susceptible to severe damage or mortality in a fire event. Characteristics typically include thin bark at maturity, crowns that retain lower branches (close to the ground), less protected buds and needles. For example, subalpine fir, grand fir and spruce are fire-intolerant species in the HLC NF.

**fire regime** a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention but including the influence of prehistoric human burning (Agee 1993; Brown 1995; Hann and Bunnell 2001). The five natural fire regimes are classified based on the average number of years between fires combined with the severity of the fire (the amount of vegetation replacement), and its effect on the dominant overstory vegetation (Hann 2005). The five natural fire regimes on the HLC NF are as follows, with detail added to describe conditions found on the HLC NF:

Fire regime group	Frequency (fire return interval)	Severity	Representative vegetation types/habitats
I	0 to 35 years	Nonlethal, low intensity to mixed severity (less than 75 percent of the dominant overstory vegetation replaced)	Ponderosa pine, dry-site Douglas-fir <i>Open forest, woodland, shrub and savanna structures maintained by frequent non-lethal fire; also includes mixed severity fire that create a mosaic of different age classes, post-fire open forests. Mean fire return interval can be greater than 35 years in systems with high temporal variation. These fires result in minimal overstory mortality (&lt;25% of dominant overstory) and small patch size (Agee 1998; Arno et al. 2000; Hessburg et al 2005). The forests that adapted to these fires on the HLC NF were often dominated by ponderosa pine or Douglas-fir; fire maintained these species and promoted open, often uneven-aged, structures. Surviving fire-resistant trees reforest the gaps created by disturbance. These fires also maintained open, dry forest savanna structures and a shifting distribution of dry limber pine/juniper ecotone communities.</i>
II	0 to 35 years	Stand-replacing (greater than 75 percent of the dominant overstory vegetation replaced)	Drier grasslands; cool-site sagebrush (such as Mountain big sagebrush) <i>Shrub or grasslands maintained or cycled by frequent fire; fire typically remove non-sprouting shrubs, tops of sprouting shrubs and most tree regeneration. These fires are important in vegetation communities such as big mountain sagebrush.</i>
III	35 to 100+ years	Nonlethal and mixed severity (less than 75 percent of the dominant overstory vegetation replaced)	Interior dry-site shrub communities (such as warm-site sagebrush - Big sage, basin big sagebrush); moist-site Douglas-fir/lodgepole pine forests <i>A mosaic of different ages, open forests, early to mid-seral forest structure stages, and shrub and herb dominated patches is maintained by infrequent fire events. Mixed severity fires kill a moderate amount of the overstory, burning with a mosaic of severities but replacing &lt;75% of the overstory (Barrett et al. 2010). Highly variable patch sizes are created, with a mosaic of effects including stand replacement, low severity, and unburned areas (Agee 1998; Arno et al. 2000). This creates an irregular pattern with an abundant amount of edge. Fire tolerant species often survived many fire events, with large, old trees becoming</i>

Fire regime group	Frequency (fire return interval)	Severity	Representative vegetation types/habitats
			<i>prominent overstory components. These fires also resulted in unburned patches that could develop into climax conditions dominated by shade tolerant species.</i>
IV	35 to100+ years	Stand-replacing, high intensity (greater than 75 percent of the dominant overstory vegetation replaced)	Lodgepole pine <i>Large patches of similar age, post-fire structures and early to mid-seral forests are cycled by infrequent fire events. Stand replacing fires kill most of the trees (&gt;75%) over a substantial area (Barrett et al. 2010) and creating an intermediate amount of edge (Agee 1998; Arno et al. 2000). Lodgepole pine regenerates large areas without a living seed source by storing serotinous cones on trees and in the soil that open under intense heat. Fire return intervals are generally long; however, shorter intervals also occur (USDA 1990; Barrett 1993) and forests may re-burn after the dead trees have fallen. Lodgepole pine produces open cones at a very young age to re-seed re-burned or understocked patches. Serotiny in fire-prone ecosystems is typically expressed from 30-60 years of age (USDA 1983) to ensure that seed is available for regeneration after the next stand-replacing event.</i>
V	200+ year	Stand-replacing, high intensity.	Boreal forest and high elevation conifer forest; lodgepole pine/subalpine fir; subalpine fir; whitebark pine <i>Variable size patches of shrub and herb dominated structures, or early to mid to late seral forest occur depending on the type of biophysical environment and are cycled by rare fire or other disturbance events. These forests often have complex structures influenced by small gap disturbances and understory regeneration. These fires result may result in the regeneration of lodgepole pine but also provide suitable sites for the establishment of whitebark pine at the highest elevations. Many sites become dominated by subalpine fir at the later stages of succession.</i>

**fire risk** the probability or chance of fire starting determined by the presence and activities of causative agents.

**fire suppression** the work and activities connected with fire extinguishing operations, beginning with discovery and continuing until the fire is completely extinguished.

**fire-tolerant tree species** a tree type resistant to severe damage or mortality in a fire event. Characteristics include thick bark at maturity, readily self-pruning (lower branches are shed as the tree grows), and protected buds. Examples of fire-tolerant species on the HLC NF are western larch, ponderosa pine and, to a lesser extent, Douglas-fir.

**fish passage** a clear access for migrating fish through a potential barrier.

**focal species** a small subset of species whose status permits inference to the integrity of the larger ecological system to which it belongs and provides meaningful information regarding the effectiveness of the plan in maintaining or restoring the ecological conditions to maintain the diversity of plant and animal communities in the plan area. Focal species would be commonly selected on the basis of their functional role in ecosystems (36 Code of Federal Regulations 219.19).

**food-conditioned (bear)** a bear that associates humans and areas of human activity (e.g., campgrounds, cabins, dwellings, etc.) with food, usually as a result of repeatedly obtaining food rewards (e.g., garbage, camp food, pet or livestock food, bird seed, etc.) in such areas.

**forage** the browse and herbage available to livestock or wildlife for feed.

**forage allocations for ecological needs** determination of forage production for the dominant ecological sites (or their equivalent) within the grazing allotment (at the allotment management planning level). Forage allocations permitted for livestock grazing are made after analyzing the effects to other resources. Examples of resource areas taken into consideration prior to determining forage availability for livestock grazing include soil health, native plant community viability and resilience, hydrologic function, aquatic habitat quality, and the forage and cover needs of wildlife species.

**forb** a herbaceous (herb-like) plant other than grass or grass-like plants.

**forest connectivity** see ‘connectivity’ above; an area providing those functions for wildlife species that prefer to remain within or close to forested cover.

**forest dominance type** a classification that reflects the most common tree species within a forest stand. The dominant species comprises at least 40 percent of the stocking, as measured by canopy cover, basal area, or trees per acre, depending on available information and stand characteristics.

**forest floor** all organic matter generated by forest vegetation, including litter and unincorporated humus, on the mineral soil surface.

**forest health** the perceived condition of a forest derived from concerns about such factors as its age, structure, composition, function, vigor, presence of unusual levels of insects or disease, and resilience to disturbance. A useful way to communicate about the current condition of the forest, especially with regard to the ability of the ecosystem to respond to disturbances. Note: perception and interpretation of forest health are influenced by individual and cultural viewpoints, land management objectives, spatial and temporal scales, the relative health of the stands that comprise the forest, and the appearance of the forest at a point in time.

**forest land** an area at least 10 percent occupied by forest trees of any size or formerly having had such tree cover and not currently developed for nonforest uses. Lands developed for nonforest use include areas for crops, improved pasture, residential or administrative sites, improved roads of any width and adjoining road clearing, and power line clearings of any width.

**forest management** the practical application of biological, physical, quantitative, managerial, economic, social, and policy principles to the regeneration, management, utilization, and conservation of forests to meet specified goals and objectives while maintaining the productivity of the forest. Note: forest management includes management for aesthetics, fish, recreation, urban values, water, wilderness, wildlife, wood products, and other forest resource values. Forest management varies in intensity from leaving the forest alone, to a highly intensive regime composed of periodic silvicultural treatments.

**forest plan** a document that guides sustainable, integrated resource management of the resources within a plan area and within the context of the broader landscape, giving due consideration to the relative values of the various resources in particular areas (36 Code of Federal Regulations 219.1(b)). Consistent with the Multiple-Use Sustained-Yield Act of 1960 (16 United States Code 528–531), the FS manages NFS lands to sustain the multiple use of its renewable resources in perpetuity while maintaining the long-term health and productivity of the land. Resources are managed through a combination of approaches and concepts for the benefit of human communities and natural resources.

**forest structure** a complex three-dimensional construct consisting of the various horizontal and vertical physical elements of the forest, including tree diameters, tree heights, tree ages, stand density, canopy layers, quantity/quality of deadwood, herbaceous species, and the clumpiness of the stand. There is no one measure to quantify or describe structure. Often individual forest attributes are described and integrated to evaluate forest structure, such as tree sizes or ages or number of canopy layers.

**forest system road** see NFS road.

**forest type** a category of forest usually defined by its vegetation, particularly its dominant vegetation as based on percentage cover of trees (for example, subalpine fir/spruce; lodgepole pine).

**fuel management** an act or practice of controlling flammability and reducing resistance to control of wildland fuels through mechanical, chemical, biological or manual means, or by fire, in support of land management objectives (from Northern Wildfire Coordinating Group 2013).

**fuel treatment** the manipulation or removal of dead or live plant materials to reduce the likelihood of ignition and/or lessen potential damage and resistance to fire control (example treatments include, logging, chipping, crushing, piling and burning) (from National Wildfire Coordinating Group 2013).

**fuelwood** a term for wood that is used for conversion to a form of energy (for example, firewood, biomass).

**function** ecological processes that sustain composition and structure, such as energy flow, nutrient cycling and retention, soil development and retention, predation and herbivory, and natural disturbances such as wind, fire, and floods.

## G

**geographic area (GA)** a spatially contiguous land area identified within the plan area. A geographic area may overlap with a management area (36 Code of Federal Regulations 219.19).

**geographic information system (GIS)** a computer process that links database software to graphics (spatially explicit) software and provides database and analytic capabilities.

**goals (GO)** broad statements of intent, other than desired conditions, usually related to process or interaction with the public. Also see chapter 1.

**gradient (stream)** the slope of a streambed.

**graminoids** grasses.

**grazing allotment** a designated area of land that is available for livestock grazing and is represented on a map. A grazing allotment can include NFS and non-NFS lands. Permits are issued for the use of allotments or portions of allotments. Allotments may be:

- active: livestock grazing allotments, including pack and saddle stock allotments.
- closed: areas having suitable livestock range that have been closed to livestock grazing by administrative decision or action.
- combined: an allotment that has been combined into another allotment, and therefore, no longer exists as an independent allotment.
- vacant: an allotment that does not have a current grazing permit issued.

**grazing authorizations and reauthorizations** grazing permits with term status of ten years or with temporary status of one year. Upon expiration of an existing grazing permit, the permit can be reauthorized provided eligibility and qualification requirements are met. Upon sale of base property or permitted livestock, a grazing permit with term status may be authorized to the purchaser of base property or permitted livestock as the preferred applicant, provided the eligibility and qualifications requirements are met (36 CFR 222).

**grazing permit** authorizes livestock to use National Forest System or other lands under Forest Service control for the purpose of livestock production. Term permits are issued for up to 10 years with priority for renewal at the end of the term. On-and-off grazing permits are permits with specific provisions on rangelands only part of which is National Forest System lands or other lands under Forest Service control. Private land grazing permits are permits issued to persons who control grazing lands adjacent to or within national forest proclaimed boundary and who waive exclusive grazing use of these lands to the United States for the full period the permit is to be issued (36 CFR 222). Temporary permits are issued for up to 1 year. Examples include livestock use permits for transportation livestock to persons engaged in commercial packing or dude ranching.

**grazing permit in inactive status** a grazing permit for which all permitted uses have expired, been cancelled, or been waived.

**grazing permit in nonuse status** a term that applies to circumstances where a grazing permit holder either does not place any livestock, or at numbers less than 90% of permitted, on an allotment due to personal convenience, resource protection, or range research reasons (FSH 2209.13). Approval for grazing permit non-use is granted by a Forest Service authorized officer prior to livestock turnout for the specific grazing year.

**greenline (riparian)** the first perennial vegetation that forms a lineal grouping of community types on or near the water's edge. Most often it occurs at or slightly below the bankfull stage.

**Grizzly Bear Conservation Strategy (GBCS)** a document published by the U.S. Fish and Wildlife Service that describes the regulatory framework for management of the Northern Continental Divide Ecosystem grizzly bear population and its habitat upon recovery and subsequent removal from the Federal list of Threatened and Endangered Species.

**grizzly bear-human conflict** an interaction between a grizzly bear and human in which bears either do, or attempt to, injure people, damage property, kill or injure livestock, damage beehives, or obtain anthropogenic foods or attractants or agricultural crops.

**grizzly bear management zone 1 (zone 1)** an area surrounding the grizzly bear primary conservation area in the NCDE where the intent is to maintain occupancy by grizzly bears but at expected lower densities than inside the primary conservation area.

**grizzly bear management zone 2 (zone 2)** an area adjacent to the grizzly bear zone 1 and/or zone 3 in the NCDE where grizzly bears, particularly males, would have the opportunity to move between the NCDE and adjacent ecosystems. The intent of the zone 2 area is to allow for resource management and recreational opportunities while responding to grizzly bear-human conflicts with appropriate management actions.

**grizzly bear management zone 3 (zone 3)** the area that primarily consists of areas where grizzly bears do not have enough suitable habitat to support population growth. Grizzly bear occupancy will not be actively discouraged in zone 3, and the management emphasis is on conflict response.

**ground-based logging system** a log skidding method using tracked or wheeled tractors. These tractors or “skidders” typically operate on gentle slopes (for example, on slopes less than 40%). Steeper slopes may require cable logging systems.

**ground cover** the material on the soil surface that impedes raindrop impact and overland flow of water. Ground cover consists of all living and dead herbaceous and woody material in contact with the ground and all rocks greater than 0.75 inches in diameter.

**ground fire** term used to describe organic material, such as duff, organic soils, roots, and rotten buried logs, burning beneath the surface. (from National Wildfire Coordinating Group 2013)

**groundwater-dependent ecosystem** a community of plants, animals, and other organisms whose extent and life processes depend on groundwater. Examples include many wetlands, groundwater-fed lakes and streams, cave and karst systems, aquifer systems, springs, and seeps.

**group selection method** a cutting method to develop and maintain uneven-aged stands by the removal of small groups of trees (generally up to 0.5 acre in size) at periodic intervals to meet a predetermined goal of size distribution and species composition in remaining stands.

**group use** an activity conducted on NFS lands that involves a group of 75 or more people, either as participants or spectators (36 Code of Federal Regulations 251.51).

**guide** to provide services or assistance (such as supervision, protection, education, training, packing, touring, subsistence, transporting people, or interpretation) for pecuniary remuneration or other gain to individuals or groups on NFS lands (36 Code of Federal Regulations 251.51).

**guideline (GDL)** a constraint on project and activity decision-making that allows for departure from its terms, so long as the purpose of the guideline is met. Also see chapter 1.

## H

**habitat type** an aggregation of plant communities of similar biophysical characteristics, and similar function and response to disturbances. A habitat type will produce similar plant communities at climax. On the HLC NF, habitat types are based upon Pfister et al. 1977. Also see potential vegetation type.

**habituated (bear)** a bear that does not display avoidance behavior near humans or in human use areas (e.g., campgrounds, lodges, town sites, cabin or dwelling yards, within 100m of open roads, etc.), as a result of repeated exposure to those circumstances.

**hazard tree** a tree that has the potential to cause property damage, personal injury or fatality in the event of a failure, where failure is the mechanical breakage of a tree or tree part. Failures often result from the interaction of defects, weather factors, ice or snow loading or exposure to wind. Tree hazards may include dead or dying trees, dead parts of live trees, or unstable live trees (due to structural defects or other factors) that are within striking distance of people or property (a target). Defects are flaws in a tree that reduce its structural strength. Trees may have single or multiple defects, which may or may not be detectable. Failures result in accidents only if they strike a target.

**head month (HM)** one month’s use and occupancy of the range by one animal, e.g. one weaned or adult cow with or without calf, bull, steer, heifer, horse, mule or 5 sheep or goats.

**Healthy Forests Restoration Act** public law (108-148), passed in December 2003, which provides statutory processes for hazardous fuel reduction projects on certain types of at-risk NFS and Bureau of Land Management managed public lands. The Healthy Forests Restoration Act also provides other

authorities and direction to help reduce hazardous fuel and restore healthy forest and rangeland conditions on lands of all ownerships (from Northern Rockies Lynx Management Direction 2007).

**heterogeneity** exhibiting dissimilarity among members of a group (Helms 1998).

**high-use areas** areas that receive high levels of visitor use such as trailheads, developed campgrounds, etc.

**high value resources** includes things such as but not limited to; communities, watersheds, infrastructure, ecosystem functions, air quality, rangeland values, recreation, timber, and wildlife - as identified through a wildfire risk assessment.

**highway** a term that includes all roads that are part of the National Highway System. (23 Code of Federal Regulations 470.107(b)).

**historic climax** the plant community that existed at the time of European immigration and settlement in North America. It is the plant community that was best adapted to the unique combination of environmental factors associated with the site. The historic climax plant community was in dynamic equilibrium with its environment. It is the plant community that was able to avoid displacement by the suite of disturbances and disturbance patterns (magnitude and frequency) that naturally occurred within the area occupied by the site.

**historical range of variation** the variation in ecological conditions resulting from disturbance regimes and other natural influences under which the ecosystem and forests evolved. Typically refers to the period prior to the dramatic changes in human land uses and patterns beginning with the influx of European-Americans about the mid-1800s. Historical range of variation is considered valuable for providing a context or frame of reference to evaluate current ecosystem conditions and understanding what an ecologically healthy and sustainable condition might look like. Also see natural range of variation.

**home range** an area, from which intruders may or may not be excluded, to which an individual animal restricts most of its usual activities.

**hydrologic unit code (HUC)** the United States is divided and sub-divided into successively smaller hydrologic units (watersheds) which are classified into six levels: regions (HUC 1), sub-regions (HUC 2), basin (HUC 3), subbasin (HUC 4), watershed (HUC 5), subwatersheds (HUC 6). The hydrologic units are arranged or nested within each other, from the largest geographic area (regions) to the smallest geographic area (cataloging units). Each hydrologic unit is identified by a unique hydrologic unit code consisting of two to twelve digits based on the levels of classification in the hydrologic unit system.

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**inherent capability of the plan area** the ecological capacity or ecological potential of an area characterized by the interrelationship of its physical elements, its climatic regime, and natural disturbances.

**integrated pest management** a broad-based approach that includes several techniques, including physical, chemical, biological, and cultural control for long-term and economic control of invasive species.

**integrated resource management** a means to realize many benefits from a forest or other natural area and assure the renewable benefits are there for future generations (from National Wildfire Coordinating Group 2013).



**integrity (ecology)** see ecological integrity.

**interagency consultation** a process required by Section 7 of the Endangered Species Act whereby federal agencies proposing activities in a listed species habitat confer with the USFWS about the impacts of the activity on the species (50 CFR 402).

**intermediate harvest** a removal of trees from a stand between the time of its formation and a regeneration harvest. Most commonly applied intermediate cuttings are release, thinning, improvement, and salvage.

**intermittent stream** a stream that flows only at certain times of the year when it receives water, usually from springs or a surface source such as melting snow.

**introduction** as a result of human activity, the intentional or unintentional escape, release, dissemination, or placement of an organism into an ecosystem to which it is not native (EO 13751).

**invasive plant management activities** methods and practices designed to locate, monitor, prevent and reduce invasive species infestations and introductions. These include prevention, survey, inventory, treatment, and monitoring activities.

**invasive species** with regard to a particular ecosystem, a non-native organism whose introduction causes or is likely to cause economic or environmental harm, or harm to human, animal, or plant health (EO 13751).

## K

**key ecosystem characteristic** the dominant ecological characteristic(s) that describes the composition, structure, function and connectivity of terrestrial, aquatic and riparian ecosystems that are relevant to addressing important concerns about a land management plan. Key ecosystem characteristics are important to establishing or evaluating plan components that would support ecological conditions to maintain or restore the ecological integrity of ecosystems in the plan area.

**key seasonal habitats** habitats that provide specific characteristics (e.g., hiding or thermal cover, forage, lack of snow, lack of disturbance, etc.) that are required for an animal's survival or other life history needs during specific seasons. Key seasonal habitats provide components that may be limiting to survival or reproduction, that may not be available in other parts of an individual or population's range at that time of year, and that may be needed for specific activities (such as breeding, calving, nesting, or others) occurring seasonally.

## L

**laccolith** a sheet intrusion (or concordant pluton) that has been injected between two layers of sedimentary rocks. The pressure of the magma is high enough that the overlying strata's are forced upwards forming a dome shape rock formation.

**lacustrine** of, relating to, or associated with lakes.

**ladder fuel** a term to describe plant materials that provide vertical continuity between forest strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease.

**land management plan** see forest plan.

**landscape** a defined area irrespective of ownership or other artificial boundaries, such as a spatial mosaic of terrestrial and aquatic ecosystems, landforms, and plant communities, repeated in similar form throughout such a defined area (36 Code of Federal Regulations 219.19).

**landtype** a unit shown on an inventory map with relatively uniform potential for a defined set of land uses. Properties of soils landform, natural vegetation, and bedrock are commonly components of landtype delineation used to evaluate potentials and limitations for land use.

**lands special uses** authorization to occupancy and use NFS lands by private individuals or companies for a wide variety of uses such as roads, utility corridors, communications sites, and other private or commercial uses that cannot be reasonably accommodated on non-NFS lands. Activities and facilities authorized through a legal document such as a permit, lease or easement. Lands special uses are nonrecreation types of uses. A list of the allowable uses which can be authorized under a special use authorization is found in the Special Uses Handbook 2709.11, Section 19, Exhibit 02.

**large-tree structure** is defined using the following minimum criteria:

- warm dry potential vegetation type: “Large” includes areas with at least 5 trees per acre of trees greater than or equal to 15” diameter. “Very large” includes areas with at least 4 trees per acre greater than or equal to 20” diameter.
- cool moist potential vegetation type: “Large” includes areas with at least 10 trees per acre of trees greater than or equal to 15” diameter. “Very large” includes areas with at least 10 trees per acre greater than or equal to 20” diameter.
- cold potential vegetation type: “Large” includes areas with at least 8 trees per acre of trees greater than or equal to 15” diameter. “Very large” includes areas with at least 8 trees per acre greater than or equal to 20” diameter

**late-seral/successional stage (forest)** a late stage in the sequence of plant communities that develops after a disturbance, such as fire or harvest. On the forested communities of the HLC NF, this stage may begin to develop 140 years or more after the disturbance. Forest structures can be very diverse, with wide range in densities, number of canopy layers and trees sizes. Usually larger trees are dominant (greater than 16 inches diameter breast height).

**Lidar** a detection system that works on the principle of radar but uses a light from a laser.

**linkage** (also linkage habitat, linkage area, or linkage zone) an area that will support a low density population of a species during certain parts of the year, and that facilitates demographic or genetic connectivity between geographically separate patches of habitat suitable for that species. Linkage areas facilitate movements of an animal (for example, dispersal, breeding season movements, exploratory movements) beyond its home range. Linkage areas may include sizeable areas of nonhabitat and areas influenced by human actions.

**livestock** domestic animals of any kind kept or raised for use or pleasure. Small livestock refers to animals such as sheep, goats, and llamas.

**livestock movement guides** defined utilization limits for key species developed at the allotment management plan level that when achieved would trigger the need for livestock to be moved to the next scheduled pasture/area or off of the allotment depending on the authorized management system in place on any respective allotment.

**losing stream** a stream or river that loses its water as it flows downstream. Water infiltrates into the ground recharging the local groundwater because the groundwater is below the bottom of the stream channel.

**lynx habitat** boreal forest with gentle rolling topography, dense horizontal cover, deep snow, and moderate to high snowshoe hare densities (more than 1 hare/2 ha (0.4 hares/2 ac)). In the western United States, forest cover types dominated by Engelmann spruce, subalpine fir and lodgepole pine provide habitat for lynx (from the Canada Lynx Conservation Assessment and Strategy, 3<sup>rd</sup> Edition).

## M

**maintain** to keep in existence or continuance of the desired ecological condition in terms of its desired composition, structure, and processes. Depending upon the circumstance, ecological conditions may be maintained by active or passive management or both.

**management area** a land area identified within the plan area that has the same set of applicable plan components. A management area does not have to be spatially contiguous (36 Code of Federal Regulations 219.19).

**management system (timber)** an administrative method that includes even-aged stand and uneven-aged stand protocols.

**mature multi-story structural stage (forest)** a phase characterized by understory reinitiation, resulting in several tree age classes and vegetation layers. Fallen trees may be present, creating gaps in the overstory canopy. In lynx habitat, these stands typically have high horizontal cover from young understory trees and lower limbs of mature trees that reach the ground or snow level (from Lynx Conservation Assessment Strategy).

**mature tree** a tree which has achieved its maximum or near-maximum mean annual rate of growth in height or diameter.

**MBF/MMBF** (thousand board feet and million board feet, respectively) a specialized unit of measure for the volume of lumber in the United States and Canada. One board foot is the volume of a 1-foot length of a board 1 foot wide and 1 inch thick.

**MCF/MMCF** (thousand cubic feet and million cubic feet, respectively) a specialized unit of measure for the volume lumber. One cubic foot is a unit of true volume that measures 1x1x1 foot.

**mean annual increment of growth** the total increment of increase in volume of a stand (standing crop plus thinning removals) up to a given age divided by that age. Culmination of mean annual increment of growth is the age in the growth cycle of an even-aged stand at which the average annual rate of increase of volume is at a maximum. In land management plans, mean annual increment is expressed in cubic measure and is based on the expected growth of stands, according to intensities and utilization guidelines in the plan.

**mechanized means of transportation** a contrivance for moving people or material in or over land, water, or air, having moving parts, that provides a mechanical advantage to the user. This includes, but is not limited to, sailboats, hang gliders, parachutes, bicycles, game carriers, carts, and wagons. It does not include wheelchairs when used as necessary medical appliances. It also does not include skis, snowshoes, rafts, canoes, sleds, travois, or similar primitive devices without moving parts (36 Code of Federal Regulations 2320.5(3)).

**mesic** a type of habitat that is moderately moist.

**mid-seral/successional stage (forest)** a mid-stage in the sequence of plant communities that develop after a disturbance, such as fire or harvest. On the forested communities of the HLC NF, stands may be considered in this stage from about 40 to 140 years after the disturbance. Stand structure, such as density and number of canopy layers, can vary widely. Dominant tree sizes are typically from 5 to 15 inches diameter breast height.

**mine reclamation** the process of restoring land that has been mined to a natural or economically usable state. Although the process of mine reclamation occurs once mining is completed, the preparation and planning of mine reclamation activities occur prior to a mine being permitted or started.

**minerals** FS defines three types of mineral (and energy) resources:

- locatable minerals: commodities such as gold, silver, copper, zinc, nickel, lead, platinum, etc. and some nonmetallic minerals such as asbestos, gypsum, and gemstones.
- salable minerals: common varieties of sand, stone, gravel, cinders, clay, pumice and pumicite.
- leasable minerals: commodities such as oil, gas, coal, geothermal, potassium, sodium phosphates, oil shale, sulfur, and solid leasable minerals on acquired lands.

**mitigate** to avoid, minimize, rectify, reduce, or compensate the adverse environmental impacts associated with an action.

**mixed-severity fire/mixed-severity fire regime** a combination of nonlethal, low-intensity to stand-replacing fire effects within the perimeter of a single fire, or across consecutive events. Mixed-severity fire regimes give rise to unique patch dynamics and ecosystem responses.

**modified thinning technique** a precommercial thin prescription for a stand dominated by seedling or sapling size trees specifying use of techniques designed to develop multiple tree canopy layers over time, enhancing long-term species and structural diversity within forest stands, and contributing to forest conditions more resilient to future disturbance and climate change (also see appendix C, potential management strategies, Canada lynx habitat section).

**monitoring** a systematic process of collecting information to evaluate effects of actions or changes in conditions or relationships.

**motorized equipment** a machine that uses a motor, engine, or other nonliving power sources. This includes, but is not limited to, such machines as chain saws, aircraft, snowmobiles, generators, motorboats, and motor vehicles. It does not include small battery or gas-powered hand carried devices such as shavers, wristwatches, flashlights, cameras, stoves, or other similar small equipment.

**motorized route** a NFS road or NFS trail that is designated for motorized use on a motor vehicle use map pursuant to 36 Code of Federal Regulations 212.51.

**motorized use** the designation of roads, trails, and areas that are open to motor vehicle use as specified in Federal Register / Volume 70, Number 216 / Wednesday, November 9, 2005 /36 Code of Federal Regulations Parts 212, 251, 261, Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule.

**moving window analysis** a geographic information system procedure that quantifies the density of roads and trails by incrementally moving a template across a digital map.

**multiple use** defined by the Multiple-Use Sustained-Yield Act of 1960 (16 United States Code 528–531) as “the management of the various renewable surface resources of the NFS so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some land will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.” Additionally, the first paragraph of the MUSY Act states, “Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that, it is the policy of the Congress that the national forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes” (emphasis added).

**multiscale analysis** an assessment that looks at species and habitat conditions at different scales and takes those conditions into consideration when making a management decision. It can demonstrate project level consistency with forest plan components.

**municipal watershed** a watershed that serves a public water system as defined in Public Law 93-523 (Safe Drinking Water Act) or as defined in state safe drinking water regulations.

## N

**National Forest System** the National Forest lands reserved or withdrawn from the public domain of the United States, all National Forest lands acquired through purchase, exchange, donation, or other means, the National Grasslands and land utilization projects administered under title III of the Bankhead-Jones Farm Tenant Act (50 Stat. 525, 7 United States Code 1010-1012), and other lands, waters or interests therein which are administered by the FS or are designated for administration through the FS as a part of the system.

**native knowledge** a way of knowing or understanding the world, including traditional ecological and social knowledge of the environment derived from multiple generations of indigenous peoples’ interactions, observations, and experiences with their ecological systems. Native knowledge is place-based and culture-based knowledge in which people learn to live in and adapt to their own environment through interactions, observations, and experiences with their ecological system. This knowledge is generally not solely gained, developed by, or retained by individuals, but is rather accumulated over successive generations and is expressed through oral traditions, ceremonies, stories, dances, songs, art, and other means within a cultural context.

**native species** an organism that was historically or is present in a particular ecosystem as a result of natural migratory or evolutionary processes; and not as a result of an accidental or deliberate introduction into that ecosystem. An organism’s presence and evolution (adaptation) in an area are determined by climate, soil, and other biotic and abiotic factors.

**natural disturbance regime** the historic patterns (frequency and extent) of natural processes such as fire, insects, wind, and mass movement that affect the ecosystems and landscapes in a particular area.

**natural fire regime** see definition of “fire regime”

**natural range of variation (NRV)** the variation of ecological characteristics and processes over scales of time and space that are appropriate for a given management application. Also see historical range of variation. The natural range of variation (or historic range of variation) is a tool for assessing the

ecological integrity and does not necessarily constitute a management target or desired condition. The natural range of variation can help identify key structural, functional, compositional, and connectivity characteristics, for which plan components may be important for either maintenance or restoration of such ecological conditions.

**natural regeneration** a renewal of a tree crop by natural seeding, sprouting, suckering, or layering.

**naturally ignited wildfire** see wildfire.

**net change** (as used for NCDE grizzly bear plan components) the difference in a measurement (such as road density) after on-the-ground changes are accounted for pre- and post-project; allows for temporary changes during a project.

**NFS road** see road

**no surface occupancy** a stipulation in a fluid mineral lease that prohibits use or occupancy of the land surface in order to protect identified resource values. Lessees may develop the oil and gas or geothermal resources under the area restricted by this stipulation through the use of directional drilling from sites outside the no surface occupancy area.

**nonattainment area** an area within a state that exceeds the national ambient air quality standards.

**nonconsumptive water use** the act of removing water from an available supply and utilizing it in a manner that it returns to a waterbody.

**non-denning season** the time period when grizzly bears typically are not hibernating:

- West side of the Continental Divide: from 1 April through 30 November.
- East side of the Continental Divide: from 16 April through 30 November.

**nondiscretionary** activities involving the exploration and development of locatable mineral resources, meaning that the Forest Service cannot prohibit reasonably necessary activities required or the exploration, prospecting, or development of valuable mineral deposits.

**non-native species** with respect to a particular ecosystem, an organism, including its seeds, eggs, spores, or other biological material capable of propagating that species, that occurs outside of its natural range (Executive Order 13751).

**nonpoint source pollution** a discharge from a diffuse source, such as polluted runoff from an agricultural area or precipitation, to a water body.

**Northern Continental Divide Ecosystem** a region identified in the Grizzly Bear Conservation Strategy encompassing about 27.3 million acres of land in western and central Montana that is one of five areas in the lower 48 states where grizzly bear populations occur.

**Northern Continental Divide Ecosystem (NCDE) Coordinating Committee** an interagency group that evaluates implementation of the NCDE Grizzly Bear Conservation Strategy, promotes the exchange of data and information about the NCDE grizzly bear population among agencies and the public, and makes recommendations to the management agencies regarding implementation of the strategy. Members of the interagency group may include Montana Fish, Wildlife & Parks; U.S. Fish & Wildlife Service; U.S. National Park Service; U.S. Forest Service; U.S. APHIS Wildlife Services; U.S. Geological Survey; U.S. Bureau of Land Management; the Blackfoot Tribe; and the Confederated Salish and Kootenai Tribes.

**noxious weed** any exotic plant species established, or that may be introduced in the state, that may render land unfit for agriculture, forestry, livestock, wildlife, or other beneficial uses, or that may harm native plant communities (MCA 7-22-2101).

## O

**objective (OBJ)** a concise, measurable, and time-specific statement of a desired rate of progress toward a desired condition or conditions. Also see chapter 1.

**occupied lynx habitat** mapped lynx habitat is considered occupied by lynx when (2006 Amendment to the Canada Lynx Conservation Assessment):

1. there are at least 2 verified lynx observations or records since 1999 on the national forest unless they are verified to be transient individuals; or
2. there is evidence of lynx reproduction on the national forest

**off-highway vehicle** a motor vehicle designed for, or capable of, cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain (36 Code of Federal Regulations 212.1).

**old growth** an ecosystem distinguished by old trees and related structural attributes. For the HLC NF, old growth stands are specifically defined as those that meet the definitions in Green et al. 1992 (errata corrected 12/11). Those definitions include the discussion in that document titled “USE OF OLD GROWTH TYPE DESCRIPTIONS” (pages 11 and 12). If that document is revised or replaced by the Northern Region, the updated version will be used. Old growth identification and mapping is dynamic through time to reflect changing conditions on the landscape.

**old-growth associated species** the group of wildlife species that is associated with old-growth forest plant communities on the HLC NF.

**opening** (as pertaining to maximum opening size standard for timber harvest) a forest patch in a seedling/sapling size class (average stand diameter breast height is less than five inches) created as a result of one even-aged harvest operation (clearcut, seedtree or shelterwood seed cutting). Legacy or reserve trees left to meet other desired conditions are not counted in the calculation of size class for determining the seedling/sapling classification. Adjacent seedling/sapling stands created as a result of an earlier harvest operation are not considered part of an opening.

**open motorized route density** a moving window analysis calculation that applies to the primary conservation area portion of the NCDE and includes Federal, State, and tribal roads and motorized trails that are open to wheeled motor vehicle use by the public for any part of the non-denning season. Open motorized route density is reported as the percent of a bear management subunit that exceeds 1 mile/mile<sup>2</sup> open motorized route density calculated using a moving window analysis. Temporary changes as allowed by specific plan components (e.g., PCA-NCDE-STD-04) refer to changes to the percent of a subunit that exceeds 1 mile/mile<sup>2</sup> open motorized route density, calculated using a moving window analysis. Note: Motorized routes closed only by sign or order are considered to be open for purposes of this calculation. See also moving window analysis.

**ordinary high water mark** the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas (US Army Corps of Engineers).

**outfitting** to rent on, or deliver to, NFS lands for pecuniary remuneration or other gain any saddle or pack animal, vehicle, boat, camping gear, or similar supplies or equipment (36 Code of Federal Regulations 251.51).

**over-snow motorized use** an activity involving a motor vehicle that is designed for use over snow and that runs on a track or tracks and/or a ski or skis, while in use over snow (36 Code of Federal Regulations 212.1, Definitions).

**over-snow standard season** the time period for over snow motorized use. Generally, the season is defined as December 1 to March 31 of each year; however exceptions apply in specific areas and are noted at the applicable locations as well as in Over Snow Vehicle Use Maps for the HLC NF.

**overstory** the portion of the trees that form the uppermost canopy layer in a forest of more than one story.

## P

**Palustrine** any inland wetland which lacks flowing water. Wetlands within this category include inland marshes and swamps, as well as bogs, fens and floodplains.

**passive crown fire** a type of fire in which individual or small groups of trees torch out, but solid flaming in the canopy cannot be maintained except for short periods. Passive crown fire encompasses a wide range of crown fire behavior from the occasional torching of an isolated tree to a nearly active crown fire. Also called torching and candling.

**patch** an area distinguished from its surroundings by environmental discontinuities, such as a small area of early seral/successional forest (seedling/sapling size class) surrounded by mid-seral and late-seral/successional forest (small to large tree size classes).

**pathway** the mechanism and processes by which non-native species are moved, intentionally or unintentionally, into a new ecosystem (Executive Order 13751).

**perennial** a stream that flows continuously throughout most years and whose upper surface generally stands lower than the water table in the region adjoining the stream.

**permit** a special use authorization which provides permission, without conveying an interest in land, to occupy and use NFS land or facilities for specified purposes, and which is both revocable and terminable (36 Code of Federal Regulations 251.51).

**permit modification** the revision of one or more grazing permit terms and conditions made in accordance with 36 Code of Federal Regulations 222.4(a)(7) or (a)(8) (or applicable Code of Federal Regulations as revised).

**piscicide** a chemical substance which is poisonous to fish.

**plan** a document, or set of documents, that provides management direction for an administrative unit of the NFS developed under the requirements of the 2012 Planning Rule or a prior planning rule. Also see forest plan.

**planning area** the NFS lands covered by a forest plan.



**planned fire** any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and where applicable, National Environmental Policy Act requirements must be met, prior to ignition.

**Pleistocene** the geological epoch which lasted from about 2,588,000 to 11,700 years ago, spanning the world's recent period of repeated glaciations.

**point source pollution** a discharge from a known pollutant source, such as a sewage treatment plant, to a water body from a single location.

**pole** a tree at least 5 inches diameter breast height and smaller than 8 inches diameter at breast height.

**potential vegetation type/potential vegetation group** an assemblage of habitat types on the basis of similar biophysical environments, such as climate, slope and soil characteristics. This biophysical environment influences the vegetation characteristics and ecosystem processes that occur. The vegetation communities and conditions that would develop over time given no major natural or human disturbances (the climax plant community) would be similar within a particular potential vegetation type classification.

**Precambrian** the largest span of time in Earth's history before the current Phanerozoic Eon. It spans from the formation of Earth about 4.6 billion years ago (Ga) to the beginning of the Cambrian Period, about 541 million years ago (Ma), when hard-shelled creatures first appeared in abundance.

**precommercial thinning** the selective felling, deadening, or removal of trees in a young stand dominated by trees less than 5 inches diameter breast height. Primary purposes for thinning include to accelerate diameter increment on the remaining stems, to maintain a specific stocking or stand density range, to develop desired tree species composition, and/or to improve the vigor and quality of the trees that remain.

**prescribed burning or prescribed fire** a fire ignited via management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and National Environmental Policy Act requirements (where applicable) must be met, prior to ignition (from National Wildfire Coordinating Group 2013).

**primary conservation area** an area identified in the NCDE Grizzly Bear Conservation Strategy to be managed as a source area for the grizzly bear population where continuous occupancy by grizzly bears would be maintained. Habitat within the primary conservation area would receive the most stringent protection. The primary conservation area is the same area as the NCDE grizzly bear recovery zone identified in the Grizzly Bear Recovery Plan (USFWS, 1993).

**productivity** the capacity of NFS lands and their ecological systems to provide the various renewable resources (such as timber) in certain amounts in perpetuity. In land management, productivity is an ecological term, not an economic term.

**project** an organized effort to achieve an outcome on NFS lands identified by location, tasks, outputs, effects, times, and responsibilities for execution (36 CFR § 219.19).

**project** (in grizzly bear habitat in the NCDE) for purposes of the motorized access standards and guidelines in the primary conservation area of the NCDE, refers to any temporary activity requiring construction of new roads, temporary roads, reconstruction or opening of restricted roads during the non-denning season, if such use exceeds administrative use levels (see administrative use). Activities involving recurring helicopter use (see recurring helicopter use) are also considered to be a project.

**projected timber sale quantity** the estimated quantity of timber meeting applicable utilization standards that is expected to be sold during the plan period. As a subset of the projected wood sale quantity, the projected timber sale quantity includes volume from timber harvest for any purpose from lands in the plan area based on expected harvests that would be consistent with the plan components. The projected timber sale quantity is also based on the planning unit's fiscal capability and organizational capacity. Projected timber sale quantity is not a target nor a limitation on harvest and is not an objective unless the responsible official chooses to make it an objective in the plan.

**projected wood sale quantity** the estimated quantity of timber and other wood products that is expected to be sold from the plan area for the plan period. The projected wood sale quantity consists of the projected timber sale quantity as well as other woody material such as fuelwood, firewood, or biomass that is also expected to be available for sale. The projected wood sale quantity includes volume from timber harvest for any purpose based on expected harvests that would be consistent with the plan components. The projected wood sale quantity is also based on the planning unit's fiscal capability and organizational capacity. Projected wood sale quantity is not a target nor a limitation on harvest, and is not an objective unless the responsible official chooses to make it an objective in the plan.

**project** an organized effort to achieve an outcome on NFS lands identified by location, tasks, outputs, effects, times, and responsibilities for execution (36 Code of Federal Regulations 219.19).

**proposed action** a project, activity, or action that a federal agency aims to implement or undertake, and which is the subject of an environmental analysis. Proposed action is a specific term defined under the National Environmental Policy Act.

**proposed species** a type of animal or plant that is proposed by the USFWS, or the National Marine Fisheries Service, through the Federal Register to be listed for protection under Section 4 of the Endangered Species Act.

**public involvement** a process designed to broaden the information base upon which agency decisions are made. The process involves informing the public about FS activities, plans, and decisions, and participation in the planning processes which lead to final decision making.

## R

**rangelands** land on which the indigenous vegetation (climax or natural potential) is predominantly grasses, grass-like plants, forbs, or shrubs and is managed as a natural ecosystem. If plants are introduced, they are managed similarly. Rangelands include natural grasslands, savannas, shrublands, many deserts, tundra, alpine communities, marshes, and wet meadows (Society for Range Management 1999). Also included in this definition are oak and pinyon-juniper woodlands.

**rangeland health** the degree to which the integrity of the soil and ecological processes are sustained.

**range improvements** developments and/or activities (treatments) intended to improve rangeland and watershed conditions, enhance wildlife habitat, enhance or improve livestock grazing management or serve similar purposes. There are two kinds of range improvements: nonstructural and structural. Seedings or prescribed burns are examples of nonstructural range improvements. Fences or facilities such as wells or water pipelines are examples of structural improvements.

**reach** a length of stream channel, lake, or inlet exhibiting, on average, uniform hydraulic properties and morphology.

**rearing habitat** a stable and protected micro-environment for a species to birth and rear their young. For example, for juvenile westslope cutthroat trout, rearing habitat is primarily the pool environment found in streams.

**reasonable assurance** a judgment made by the Responsible Official based on the best available scientific information and local professional experience that practices based on existing technology and knowledge are likely to deliver the intended results. Reasonable assurance applies to average and foreseeable conditions for the area and does not constitute a guarantee to achieve the intended results.

**recently burned forest** a forest area that has burned (via natural or planned ignition) in the last 10 years. These areas contain specific vegetation characteristics including recently burned snags.

**recovery** the improvement in the status of a listed species to the point at which listing as federally endangered or threatened is no longer appropriate (36 Code of Federal Regulations 219.19). This definition is for the purposes of the land management planning regulation at 36 Code of Federal Regulations part 219 and Land Management Planning Handbook 1909.12, and with respect to threatened or endangered species.

**recovery plan** a document that details actions or conditions necessary to promote improvement in the status of a species listed under the Endangered Species Act, to the point at which listing is no longer appropriate.

**recreation** the set of recreation settings and opportunities on the NFS that is ecologically, economically, and socially sustainable for present and future generations. Also see sustainable recreation.

**recreation development scale** a relative scale of development that is used in Forest Service recreation management and planning to describe the level of development associated with the diverse recreation opportunity spectrum settings within the forest.

**recreation development scale 1** recreation sites with minimum site modification. Rustic or rudimentary improvements designed for protection of the site rather than comfort of the users. Use of synthetic materials excluded. Minimum controls are subtle. No obvious regimentation. Spacing informal and extended to minimize contacts between users. Motorized access not provided or permitted. Development scale 1 recreation sites are most associated with Primitive ROS settings.

**recreation development scale 2** recreation sites with little site modification. Rustic or rudimentary improvements designed primarily for protection of the site rather than the comfort of the users. Use of synthetic materials avoided. Minimum controls are subtle. Little obvious regimentation. Spacing informal and extended to minimize contacts between users. Motorized access provided or permitted. Primary access over primitive roads. Interpretive services informal. Development scale 2 recreation sites are most associated with Semi-primitive ROS settings (both non-motorized and motorized).

**recreation development scale 3** recreation sites with moderate modification. Facilities about equal for protection of natural site and comfort of users. Contemporary/rustic design of improvements is usually based on use of native materials. Inconspicuous vehicular traffic controls usually provided. Roads may be hard surfaced and trails formalized. Development density about three family units per acre. Primary access may be over high standard roads. Interpretive services informal, but generally direct. Development scale 3 recreation sites are most associated with Roded Natural ROS settings.

**recreation development scale 4** recreation sites that are heavily modified. Some facilities designed strictly for comfort and convenience of users. Luxury facilities not provided. Facility design may incorporate synthetic materials. Extensive use of artificial surfacing of roads and trails. Vehicular traffic control usually obvious. Primary access usually over paved roads. Development density about three to five family units per acre. Plant materials usually native. Interpretive services often formal or structured. Development scale 4 recreation sites are most associated with Rural ROS settings.

**recreation development scale 5** recreation sites with a high degree of site modification. Facilities mostly designed for comfort and convenience of users and usually include flush toilets; may include showers, bathhouses, laundry facilities, and electrical hookups. Synthetic materials commonly used. Formal walks or surfaced trails. Regimentation of users is obvious. Access usually by high-speed highways. Development density about five or more family units per acre. Plant materials may be foreign to the environment. Formal interpretive services usually available. Designs formalized and architecture may be contemporary. Mowed lawns and clipped shrubs not unusual. Development scale 5 recreation sites are most associated with Urban ROS settings.

**recreation event** a recreational activity conducted on NFS lands for which an entry or participation fee is charged, such as animal, vehicle, or boat races; dog trials; fishing contests; rodeos; adventure games; and fairs.

**recreation opportunity spectrum** the opportunity to participate in a specific recreation activity in a particular recreation setting to enjoy desired recreation experiences and other benefits that accrue. Recreation opportunities include nonmotorized, motorized, developed, and dispersed recreation on land, water, and in the air. The six classes are the following:

- **primitive** large, remote, wild, and predominately unmodified landscapes. There is no motorized activity and little probability of seeing other people. Primitive ROS settings are managed for quiet solitude away from roads, people, and development. There are few, if any facilities or developments. Most of the primitive recreation opportunity spectrum settings coincide with designated wilderness boundaries.
- **semi-primitive nonmotorized** large, semi-remote, areas of the forest that provide for backcountry nonmotorized uses. Mountain bikes and other mechanized equipment are often present. Rustic facilities are present for the primary purpose of protecting the natural resources of the area. These settings are not as vast or remote as the primitive ROS settings, but offer opportunities for exploration, challenge, and self-reliance.
- **semi-primitive motorized** large, semi-remote areas of the forests that provide for motorized backcountry motorized on designated routes or in designated areas. Routes are designed for off highway vehicles and other high clearance vehicles. This setting offers visitors motorized opportunities for exploration, challenge, and self-reliance. Mountain bikes and other mechanized equipment are also sometimes present. Rustic facilities are present for the primary purpose of protecting the natural resources of the area or providing portals to adjacent areas of primitive, or semi-primitive, nonmotorized areas.
- **roaded natural** the roaded natural setting is managed as natural appearing with nodes and corridors of development that support higher concentrations of use, user comfort, and social interaction. The road system is well defined and can typically accommodate sedan travel. System roads also provide easy access to adjacent in semi-primitive motorize, semi-primitive nonmotorized and primitive areas.

- **rural** the rural settings represent the developed recreation sites and modified natural settings with higher concentrations of use and increased opportunities for group recreation activities and social interactions. Facilities are designed primarily for user comfort and convenience. The road system is well defined, often paved, and can easily accommodate all forms of transportation. Rural settings often include a combination of private lands intermixed with FS lands.
- **urban** the urban setting is characterized by a substantially developed environment although the background may have natural appearing elements. Highly developed ski areas, visitor centers, interpretive centers, and resorts are examples of an urban setting on National FS lands. Urban areas offer visitor comfort and convenience and modern building materials, such as concrete and asphalt, are a common occurrence.

**recreation setting** the social, managerial, and physical attributes of a place that, when combined, provide a distinct set of recreation opportunities. The FS uses the recreation opportunity spectrum to define recreation settings and categorize them into six distinct classes: primitive, semi-primitive nonmotorized, semi-primitive motorized, roaded natural, rural, and urban. Also see recreation opportunity.

**recurring helicopter use** a type of helicopter flight that involves multiple trips/passes each day consisting of low-altitude (< 500 meters above-ground-level) flights that continues for a duration longer than 48 consecutive hours.

**reforestation** the renewal of forest cover by planting, seeding, and natural means (such as seed from existing trees on the site).

**reference watershed** designated watersheds that have been minimally managed and meet the following criteria: no grazing for the past 40 years, low road density, no apparent hard rock mining in the riparian zone, and less than 10% of upstream catchment has been harvested.

**refugia** location and habitats that support populations of organisms that are limited to small fragments of their geographic range.

**regeneration** the renewal of a forest, whether by natural or artificial means. This term may also refer to a tree crop itself.

**regeneration harvest** any removal of trees intended to assist in the regeneration of a new age class or to make regeneration of a new age class possible. Regeneration harvest may be through even-aged or uneven-aged methods.

**regeneration method** the cutting approach used to regenerate a stand. Example methods include clearcut, seedtree and shelterwood cutting methods.

**relative return on investment** a means to evaluate the conservation benefits of an invasive plant control project in relation to cost (Murdock et al. 2007).

**resilience (ecology)** the capacity of a (plant or animal) community or ecosystem to maintain or regain normal function and development following disturbance.

**resistance** the ability of a community to avoid alteration of its present state by a disturbance (Helms 1998).

**resource selection function** the relative probability of an animal using a unique set of habitat (landscape) characteristics. For studies involving radio-collared animals, “use” of landscape combinations is compared to the “availability” of those combinations in a designated study area.

**restocked** the condition of the growing space occupancy of trees to be achieved after a disturbance that has substantially altered the existing stocking (see “stocking”).

**restoration** the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed; ecological restoration focuses on reestablishing the composition, structure, pattern, and ecological processes necessary to facilitate terrestrial and aquatic ecosystems sustainability, resilience, and health under current and future conditions (36 Code of Federal Regulations 219.19).

**riffle** a shallow rapid where the water flows swiftly over completely or partially submerged obstructions (rocks, etc.) to produce surface agitation, but standing waves are absent.

**riparian area** a three-dimensional ecotone of interaction that include terrestrial and aquatic ecosystems that extend into the groundwater, above the canopy, and outward across the floodplain, up the near-slopes that drain to the water, laterally into the terrestrial ecosystem, and along the water course at variable widths.

**riparian ecosystem** a transition between the aquatic ecosystem and the adjacent upland terrestrial ecosystem. A riparian ecosystem is identified by soil characteristics and by distinctive vegetative communities that require free or unbounded water.

**riparian management zone (RMZs)** are portions of watersheds where riparian-associated resources receive primary emphasis, and management activities are subject to specific plan components including standards and guidelines. RMZs include traditional riparian corridors, wetlands, intermittent streams, and other areas that maintain the integrity of aquatic ecosystems.

RMZs shall be delineated on the ground based on site conditions as follows:

- **Category 1 fish-bearing streams:** RMZs consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel), whichever is greatest.
- **Category 2 permanently flowing non-fish bearing streams:** RMZs consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream channel), whichever is greatest.
- **Category 3 *constructed ponds and reservoirs, and wetlands greater than 1 acre*** – RMZs consist of the body of water or wetland and: the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or the extent of unstable and potentially unstable areas, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance from the edge of the wetland greater than 1 acre or the maximum pool elevation of constructed ponds and reservoirs, whichever is greatest.  
*lakes and natural ponds* - RMZs consist of the body of water and: the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or to the extent of unstable and potentially unstable areas, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance, whichever is greatest.
- **Category 4 *seasonally flowing or intermittent streams, wetlands, seeps and springs less than 1 acre, and unstable and potentially unstable areas*** - This category applies to features with high variability in size and site-specific characteristics. At a minimum, the RMZs should include:
  - The extent of unstable and potentially unstable areas (including earthflows).
  - The stream channel and extend to the top of the inner gorge.

- The stream channel or wetland and the area from the edges of the stream channel or wetland to the outer edges of the riparian vegetation, extending from the edges of the stream channel to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest. A site-potential tree height is the average maximum height of the tallest dominant trees for a given site class.
- Intermittent streams are defined as any non-permanent flowing drainage feature having a definable channel and evidence of annual scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two physical criteria. Fish-bearing intermittent streams are distinguished from non-fish-bearing intermittent streams by the presence of any species of fish for any duration. Many intermittent streams may be used as spawning and rearing streams, refuge areas during flood events in larger rivers and streams or travel routes for fish emigrating from lakes. In these instances, the guidelines for fish-bearing streams would apply to those sections of the intermittent stream used by the fish.

In order to achieve watershed desired conditions, the RMZ is broken into two areas called the inner and outer RMZs. Some activities are prohibited or restricted in the inner RMZ, whereas more active management is allowed in the outer RMZ. RMZs are not intended to be “no touch zones,” but rather “carefully managed zones” with an increase in protections in close proximity to water resources.

**riparian wildlife habitat** an environment that occurs along lakes, rivers, streams, springs, and seeps where the vegetation and microclimate are influenced by year-round or seasonal water and associated high water tables. Plant and animal species in these areas are more productive and diverse than on nearby uplands, making these areas very important to many wildlife species.

**road** a motor vehicle route more than 50 inches wide, unless identified and managed as a trail. (36 Code of Federal Regulations 212.1, FS Manual 7705):

- decommissioned: the stabilization and restoration of an unneeded road to a more natural state (36 Code of Federal Regulations 212.1).
- forest road or trail: a route wholly or partly within or adjacent to and serving the NFS that is necessary for the protection, administration, and utilization of the NFS and the use and development of its resources (36 Code of Federal Regulations 212.1 – Definitions)
- impassable: a road that has been treated in such a manner that the road is blocked and there is little resource risk if road maintenance is not performed on a regular basis (self-maintaining).
- intermittent stored service/intermittent service road, closed to traffic: The road is in a condition that there is little resource risk if maintenance is not performed.
- maintenance level: a term for the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria (FS Handbook 7709.59, 62.32)

Level 1: these are roads that have been placed in storage between intermittent uses. The period of storage must exceed 1 year. Basic custodial maintenance is performed to prevent damage to adjacent resources and to perpetuate the road for future resource management needs. Emphasis is normally given to maintaining drainage facilities and runoff patterns.

Level 2: assigned to roads open for use by high clearance vehicles. Passenger car traffic, user comfort, and user convenience are not considerations.

Level 3: assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities

Level 4: assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds

Level 5: assigned to roads that provide a high degree of user comfort and convenience.

- NFS: a forest road other than a road which has been authorized by a legally documented right-of-way held by a state, county, or other local public road authority (36 Code of Federal Regulations 212.1)
- temporary: a road necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road and that is not included in a forest transportation atlas (36 Code of Federal Regulations 212.1. In the Northern Continental Divide Ecosystem primary conservation area, temporary roads will meet the definition of impassable when no longer needed.

**rotation** the number of years (including the regeneration period) required to establish and grow timber under an even-aged management system to a specified condition or maturity for regeneration harvest.

**running average** A method for computing the average of a stream of numbers for a specified period. A 10-year running average computes the mean for the values in the current year plus the previous 9 years. A running average is commonly used with time series data to smooth out short-term fluctuations and highlight longer-term trends or cycles.

## S

**salvage harvest** the removal of dead trees or trees being damaged or dying due to injurious agents other than competition, to recover value that would otherwise be lost and/or to meet other resource objectives.

**sanitation cutting** removal of trees to improve stand health by stopping or reducing the actual or anticipated spread of insects and disease.

**sapling** young tree that is larger than a seedling but smaller than a pole or small tree; typically 5 to about 25 feet tall and 1 to 5 inches diameter breast height.

**savanna** a lowland grassland with a wide scattering of trees (generally 5-10% canopy cover) that typically occurs on the driest habitats in the Warm Dry broad potential vegetation type, where the dominance of grasses and shrubs would historically be maintained by frequent fire.

**sawtimber** a collection of logs cut from trees with minimum diameter (typically greater than 6 or 7 inches diameter breast height) or trees of the same minimum diameter and of sufficient length and stem quality suitable for conversion to lumber.

**scarification** the removal of the surface organic material (duff) of an area, typically to prepare the site for reforestation.

**scenery management system** describes the existing and desired conditions of scenic character within a plan area

**scenic character** a combination of the physical, biological, and cultural images that gives an area its scenic identity and contributes to its sense of place; scenic character provides a frame of reference from which to determine scenic attractiveness and to measure scenic integrity.

**scenic integrity objectives** a measure of the degree to which a landscape is visually perceived to be complete when compared to the scenic character of that area.



- very high: landscapes where the valued landscape character “is” intact with minute if any deviations. The existing landscape character and sense of place is expressed at the highest possible level. These landscapes generally provide for ecological change only.
- high: landscapes in which the valued landscape character “appear” intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such a scale that they are not evident. Management activities do not dominate the landscape.
- moderate: landscapes in which the valued landscape character “appears slightly altered”. Noticeable deviations must remain visually subordinate to the landscape character being viewed. Management activities are subordinate to the attributes described within the described scenic character of the area.
- low: landscapes in which the valued landscape character “appears altered”. Deviations begin to dominate the landscape character being viewed but borrow valued attributes such as size, shape, edge effect and pattern of natural openings vegetation type changes or architectural styles outside of the landscape being viewed. Management activities are visible and sometimes dominant features on the landscape.
- very low: landscape where the valued landscape character “appears heavily altered”. Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as sized, shape, edge effect and pattern of natural opening, vegetative type changes or architectural styles within or outside of the landscape being viewed. Management activities are visible and dominate the views of the overall landscape.

**scion** a detached living portion of a plant, such as a bud or shoot, often a branch tip, that is grafted onto the root-bearing part of another plant.

**secure core** (grizzly bear).. an area of the NCDE primary conservation area 500 meters or more from (1) a route open to public wheeled motorized use during the grizzly bear non-denning season, (2) a gated route, or (3) a route closed only with a sign that is greater than or equal to 2,500 acres in size. Roads restricted with physical barriers (not gates), decommissioned roads, impassable roads, temporary roads, over-the-snow motorized routes/areas, and non-motorized trails are allowed within secure core, unless otherwise restricted (e.g., by other national forest plan direction). Secure core is reported as the percent of a bear management subunit meeting this definition, as calculated using a moving windows analysis. Temporary changes as allowed by specific plan components (e.g., PCA-NCDE-STD-04) refer to changes to the percent of a subunit meeting this definition, as calculated using a moving windows analysis.

**security habitat** an area with low levels of human disturbance or habitat that allows a wildlife species to remain in a defined area despite an increase in stress or disturbance. The components of security habitat can include vegetation, topography, the size of the patches of vegetation, road density, distance from roads, intensity of the disturbance, and seasonal timing of the disturbance. This general definition covers most uses of the term security habitat, except for elk and grizzly bear, which have specific definitions.

**sediment** solid material, both mineral and organic, that is in suspension, being transported, or has been moved from its site of origin by air, water, gravity, or ice.

**seedling** a young tree that has just germinated but has not yet reached sapling size, typically 1 to 5 feet tall.

**seedling/sapling** a size category for forest stands in which trees less than 5 inches in diameter and less than about 25 feet tall are the predominant vegetation.

**seedtree method** a cutting technique used to regenerate a stand in which nearly all trees are removed from an area, except for a small number of trees that are left singly or in small groups.

**seedtree with reserves** the application of the seedtree method with the intention of retaining or reserving all or a portion of the seed trees for future stand structure.

**selection method** a cutting technique used to regenerate a forest stand and maintain an uneven-aged structure, by periodically removing some trees within multiple size classes either singly or in small groups or strips.

**sensitive soils** riparian and hydric soils, mollic soils, ash and loess influenced soils, soils developed in igneous intrusive rocks, shallow soils, and landslide prone areas

**seral** a biotic community that is developmental; a transitory stage in an ecologic succession.

**seral/structural stage** a phase of development of an ecosystem in ecological succession from a disturbed, relatively unvegetated state to a complex, mature plant community.

**shade-intolerant** a plant species that does not grow well or dies from the effects of too much shade.

**shade-tolerant** a plant species that can develop and grow successfully in the shade of other plants.

**shelterwood method** a cutting technique used to regenerate an even-aged stand in which some of the mature trees are left to provide protection for regeneration species (greater numbers of trees are left in this method than with the seedtree method). This technique may be performed uniformly throughout the stand, in strips, or in groups. Regeneration may be natural or artificial (planting).

**shelterwood with reserves** the application of the shelterwood cutting technique with the intention of retaining or reserving all or a portion of the shelterwood trees for future stand structure.

**silvicultural diagnosis** the compiling, summarizing, evaluation and analyzing of forest stand and/or landscape data. Includes describing desired conditions, interpreting management direction and determining feasible alternative silvicultural systems and initial treatments. Integrates other resource conditions and considerations, such as soils, wildlife habitat and visual sensitivity.

**silvicultural prescription** a written document that describes management activities needed to implement one or more silvicultural treatments, or a treatment sequence. The prescription documents the results of the analysis during the diagnosis phase.

**silvicultural system** a management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. It includes cultural management practices performed during the life of the stand, such as regeneration cutting, thinning, and use of genetically improved tree seeds and seedlings to achieve multiple resource benefits.

**silviculture** the theory and practice of controlling the establishment, composition, growth, and quality of forest stands in order to achieve the objectives of management.

**site preparation** a general term for a variety of activities that remove competing vegetation, slash, and other debris that may inhibit the reforestation effort.

**site productivity** the combined effect of physical and climate properties, soil depth, texture, nutrient load, precipitation, temperature, slope, elevation, and aspect, on tree growth of a specific area of land.

**ski area** a site and attendant facilities expressly developed to accommodate alpine or Nordic skiing and from which the preponderance of revenue is generated by the sale of lift tickets and fees for ski rentals, for skiing instruction and trail passes for the use of permittee-maintained ski trails. A ski area may also include ancillary facilities directly related to the operation and support of skiing activities (36 Code of Federal Regulations 251.51).

**slash** the residue left on the ground after felling and other silvicultural operations, or that has accumulated there as a result of storms, fire, or natural pruning.

**snag** a standing dead tree usually greater than 5 feet in height and 6 inches in diameter breast height.

**Source Water Protection Area (SWPA)** the area delineated by the state for a public water system (PWS) or including numerous PWSs, whether the source is ground water or surface water or both, as part of the state SWPA approved by EPA under section 1453 of the Safe Drinking Water Act.

**species of conservation concern (SCC)** a species, other than federally recognized threatened, endangered, proposed, or candidate species, that is known to occur in the plan area and for which the Regional Forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area (36 Code of Federal Regulations 219.9(c)).

**stand** a community of trees occupying a specific area and sufficiently uniform in canopy composition, age, and size class to be a distinguishable unit, forming a single management entity.

**standard (STD)** a mandatory constraint on project and activity decision making, established to help achieve or maintain the desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements. Also see chapter 1.

**stand-replacing disturbance** an agent such as fire, blowdown, insect or disease epidemic, or timber harvest, which kills or removes enough trees (usually considered 80% or more of the tree component) to result in an early seral/successional forest.

**stem exclusion structural stage** (or closed canopy structural stage) a phase when trees initially grow fast and quickly occupy the growing space, creating a closed canopy. Because the trees are tall, little light reaches the forest floor so understory plants (including smaller trees) are shaded and grow more slowly. Species that need full sunlight usually die; shrubs and herbs may become dormant. New trees are precluded by a lack of sunlight or moisture (Oliver and Larson, 1996) (Northern Rockies Lynx Management Direction).

**stocking** a measure of timber stand density as it relates to the optimum or desired density to achieve a given management objective.

**storm proofing** measures taken to reduce the risk or amount of damage to roads from major storms.

**stressor** (ecology) see ecosystem stressor

**structural stage** a particular forest condition, characterized by a set of forest structural characteristics (such as tree diameters, tree heights, tree densities, canopy layers) that is representative of a particular period of stand development. Also see stand initiation structural stage, stem exclusion structural stage, and understory reinitiation structural stage.

**structure** the organization and physical arrangement of biological elements such as, snags and down woody debris, vertical and horizontal distribution of vegetation, stream habitat complexity, landscape pattern, and connectivity. Also see forest structure.

**stubble height** the measure or height (in centimeters or inches) of herbage left ungrazed at any given time (FSTR 1743-3 1999).

**substrate** a mineral and/or organic material that forms the streambed (stream bottom).

**subwatershed** a 6th level/12 digit hydrologic unit code watershed. They range in size from 10,000 to 40,000 acres, as defined in the U.S. Geological Survey hierarchical system of watersheds.

**succession/successional stage** a predictable process of changes in structure and composition of plant and animal communities over time. Conditions of the prior plant community or successional stage create conditions that are favorable for the establishment of the next stage. The different stages in succession are often referred to as “seral,” or “successional” stages.

**suitability of lands** a determination made regarding the appropriateness of various lands within a plan area for various uses or activities, based on the desired conditions applicable to those lands. The terms suitable and suited and not suitable and not suited can be considered the same.

**summer range** a part of the overall range of a species where the majority of individuals are located between spring green-up and the first heavy snowfall; in some areas or for some species winter range and summer range may overlap.

**sustainability** the capability to meet the needs of the present generation without compromising the ability of future generations to meet their needs. For purposes of this part, “ecological sustainability” refers to the capability of ecosystems to maintain ecological integrity; “economic sustainability” refers to the capability of society to produce and consume or otherwise benefit from goods and services including contributions to jobs and market and nonmarket benefits; and “social sustainability” refers to the capability of society to support the network of relationships, traditions, culture, and activities that connect people to the land and to one another, and support vibrant communities (36 Code of Federal Regulations 219.19).

**sustainable recreation** the set of recreation settings and opportunities on the NFS that is ecologically, economically, and socially sustainable for present and future generations.

**sustained yield limit** the amount of timber, meeting applicable utilization standards, “which can be removed from [a] forest annually in perpetuity on a sustained-yield basis” (National Forest Management Act at section 11, 16 United States Code 1611; 36 Code of Federal Regulations 219.11(d)(6)). It is the volume that could be produced in perpetuity on lands that may be suitable for timber production. Calculation of the limit includes volume from lands that may be deemed not suitable for timber production after further analysis during the planning process. The calculation of the sustained yield limit is not limited by land management plan desired condition, other plan components, or the planning unit's fiscal capability and organizational capacity. The sustained yield limit is not a target but is a limitation on harvest, except when the plan allows for a departure.

**system road** see road (NFS road).

## T

**threatened species** a species that the Secretary of the Interior or the Secretary of Commerce has determined is likely to become an endangered species within the foreseeable future throughout all, or a significant portion, of its range. Threatened species are identified by the Secretary of the Interior in accordance with the 1973 Endangered Species Act. Threatened species are listed at 50 Code of Federal Regulations sections 17.11, 17.12, and 223.102.

**thrust fault** a type of low angle fault, or break in the Earth's crust across which there has been relative movement, in which rocks of lower stratigraphic position are pushed up and over higher strata. They are often recognized because they place older rocks above younger.

**timber** wood, other than fuelwood, potentially usable for lumber.

**timber harvest** the removal of trees for wood fiber use and other multiple-use purposes (36 Code of Federal Regulations 219.19).

**timber management** the growing of, tending to, commercial harvesting of, and regeneration of crops of trees (from Northern Rockies Lynx Management Direction).

**timber production** the purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use (36 Code of Federal Regulations 219.19).

**total maximum daily load** a pollution budget and includes a calculation of the maximum amount of a pollutant that can occur in a waterbody and allocated the necessary reductions to one or more pollutant sources (metals, sediment, turbidity, etc.). A total maximum daily load serves as a planning tool and potential starting point for restoration or protection activities with the ultimate goal of attending or maintaining water quality standards.

**total motorized route density** a moving window analysis calculation that applies to the primary conservation area portion of the NCDE and includes Federal, State, and tribal roads and motorized trails that do not meet the definition of an impassable road. See also moving window analysis. Total motorized route density is reported as the percent of a bear management subunit that exceeds 2 mile/mile<sup>2</sup> total motorized route density calculated using a moving window analysis. Temporary changes as allowed by specific plan components (e.g., PCA-NCDE-STD-04) refer to changes to the percent of a subunit that exceeds 2 mile/mile<sup>2</sup> total motorized route density, calculated using a moving window analysis.

**total soil resource commitment** the conversion of a productive site to an essentially nonproductive site (0 to 40 percent of natural productivity) for a period of more than 50 years. Examples include system roads, administrative sites, developed campgrounds, rock quarries, mine sites, livestock watering facilities, and home ignition zones.

**trail** a route 50 inches or less in width or a route over 50 inches wide that is identified and managed as a trail (36 Code of Federal Regulations 212.1).

**trail class** the prescribed scale of development for a trail, representing its intended design and management standards.

**trailhead** an area that provides parking for or access to a singular trail or trails through the forest.

**transitory range** forested lands that are suitable for grazing for a limited time following a complete or partial forest removal.

**transportation livestock** livestock used as pack and saddle stock for travel on NFS lands.

**two-aged stand** a stand containing two distinctive age classes or cohorts.

## U

**underburning** a fire that consumes surface fuels but not trees and some large shrubs.

**understory** the trees and other woody species which grow under a more or less continuous cover of branches and foliage formed collectively by the upper portion of adjacent trees and other woody growth.

**understory re-initiation structural stage** establishment of a new age class of trees after overstory trees begin to die, are removed, or no longer fully occupy their growing space. The stand of trees begins to stratify into vertical layers, with some small shade-tolerant trees in the understory (from Lynx Conservation and Assessment Strategy).

**uneven aged stand** a stand of trees of three or more distinct age classes, either intimately mixed or in groups.

**uneven aged system** a planned sequence of treatments designed to regenerate or maintain a timber stand with three or more age classes. Treatments include single-tree, selection, and group selection regeneration methods.

**untrammelled** a term defined in the context of the Wilderness Act as an area where human influence does not impede the free play of natural forces or interfere with natural processes in the ecosystem.

**unique and/or limited ecological sites** ecological sites (or their equivalent) that are limited in size/area and/or distribution.

**utilization standards** utilization standards are specifications for merchantable forest products offered in a timber sale.

## V

**values at risk** the elements of a community or natural area considered valuable by an individual or community that could be negatively impacted by a wildfire or wildfire operations. These values can vary by community and can include diverse characteristics such as homes, specific structures, water supply, power grids, natural and cultural resources, community infrastructure, and other economic, environmental, and social values.

**vegetation management** a management activity that changes the composition and structure of vegetation to meet specific objectives that may be done with a variety of implementation methods (such as by hand or with machinery), including but not limited to activities such as prescribed fire, timber harvest, tree planting, noncommercial stand tending, or re-arrangement and/or removal of hazardous fuels. For the purposes of this decision, the term does not include removing vegetation for permanent developments like mineral operations, ski runs, roads and the like, and does not apply to fire suppression or to wildland fire.

**viable population** a population of a species that continues to persist over the long term with sufficient distribution to be resilient and adaptable to stressors and likely future environments (36 Code of Federal Regulations 219.19).

**viewshed** the visible portion of the landscape seen from viewpoints. Viewpoints can include residences, recreational facilities, and travelways.

## W

**water quality** the physical, chemical, and biological properties of water.

**water yield** the runoff from a watershed, including groundwater outflow.

**watershed** a region or land area drained by a single stream, river, or drainage network; a drainage basin.

**watershed condition** the state of a watershed based on physical and biogeochemical characteristics and processes.

**watershed condition framework** a comprehensive approach for proactively implementing integrated restoration on priority watersheds on national forests and grasslands.

**weighted average/weighted mean** similar to an arithmetic mean or average, where instead of all data points contributing equally to the final average, some data points contribute more than others. In the example of patch sizes of early successional seedling/sapling forests, the data point is the patch. Patches are “weighted” by their acreage, and thus larger patches will contribute more to the determination of average than the smaller patches. This statistic gives insight into how large the largest patches really are, and how the individual patches are distributed along the range from smallest to largest patch size.

**wetland** an area that under normal circumstances has hydrophytic vegetation, hydric soils, and wetland hydrology.

**wild and scenic river** a waterway designated by Congress as part of the National Wild and Scenic Rivers System, which was established in the Wild and Scenic Rivers Act of 1968 (16 United States Code 1271, 1271–1287).

**wilderness** an area of land designated by Congress as part of the National Wilderness Preservation System that was established in the Wilderness Act of 1964 (16 United States Code 1131–1136).

**wilderness character** a measure that reflects the nature of wilderness being untrammeled, undeveloped, natural, and having outstanding opportunities for solitude or a primitive and unconfined type of recreation.

- **untrammeled** unhindered and free from modern human control or manipulation.
- **natural** wilderness ecological systems are substantially free from the effects of modern civilization
- **undeveloped** an area retaining its primeval character and influence, without permanent improvements or human habitation
- **solitude or a primitive unconfined type of recreation** recreation opportunities where people can experience wilderness without signs of modern civilization, recreation facilities, and/or management restrictions on visitor behavior.

**wildfire** unplanned ignition of a wildland fire or an escaped prescribed fire. Wildfire includes unplanned fires that are human-caused and those that are naturally-ignited by lightning.

**wildland fire** any nonstructure fire that occurs in the wildland. There are two types of wildland fire: unplanned (natural or human-caused ignitions) and planned (prescribed fire).

**wildland-urban interface** defined by the Healthy Forest Restoration Act § 101:

- (A) an area within or adjacent to an at-risk community that is identified in recommendations to the Secretary in a community wildfire protection plan; or
- (B) in the case of any area for which a community wildfire protection plan is not in effect—
  - (i) an area extending 1/2-mile from the boundary of an at-risk community;
  - (ii) an area within 1 1/2 miles of the boundary of an at-risk community, including any land that—
    - (I) has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community;
    - (II) has a geographic feature that aids in creating an effective fire break, such as a road or ridge top; or
    - (III) is in condition class 3, as documented by the Secretary in the project-specific environmental analysis; and
  - (iii) an area that is adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuel reduction to provide safer evacuation from the at-risk community.

**wildlife security** the protection inherent in any situation that allows animals to remain in a defined area despite an increase in stress or disturbance associated with human activities.

**windthrow** a tree or stand of trees that have been blown over by the wind.

**winter range** the portion of the overall area a species inhabits where the majority of individuals are found from the first heavy snowfall to spring green-up, or during a specific period of winter. In the Rocky Mountains, winter range areas tend to have a relatively low amount of snow cover.

## X

**xeric** (of an environment or habitat) containing little moisture; very dry.

**xeric ecotone** the zone of transition between nonforested grass/shrub communities and forested communities, and may often blend with savannas. This zone is found on dry potential vegetation types and shifts in location and condition based on climate influences, successional processes, and disturbance processes. See also “ecotone.”

## Y

**yarding** the operation of hauling timber from the stump to a collecting point.



## Preparers

### Core interdisciplinary team members

<b>Name</b>	<b>Responsibility</b>	<b>Years of Experience</b>
Deb Entwistle	Team Leader	26
David Anderson	Analyst	26
Elizabeth Casselli	Recreation	32
Wendy Clark	Wildlife	29
Wayne Green, retired	Watershed	16
Jordan Larson	Economics	13
Amanda Milburn	Vegetation	19
Scott Nagel	Watershed	13
Rebecca Rasch	Social Science	8
Kyle Schmitt	Range and Invasive Plants	18
Ashley Snellman	Administrative	19
Liz Smith, retired	Writer/Editor	33
Lori Wollan	GIS	30

### Ad hoc team members

<b>Name</b>	<b>Responsibility</b>	<b>Years of Experience</b>
Eric Archer	Fisheries	22
Liz Burke	Conservation Education	17
Kathy Bushnell	Helena District Ranger	16
Laura Conway	Wildlife	30
Justina Dumont	Sensitive Plants	8
Tessa Donahue	Lands/Special Uses	16
Rory Gluekert	Recreation	9
Dave Kemp	Wildlife	5
Jonathan LeBlanc	Soils	6
George Liknes, retired	Fisheries	41
Jonathan Olsen	Fire/Fuels	25
Steve Opp	Minerals	27
Timory Peel	Regional Planner	17
Denise Pengeroth	Wildlife	34
Arian Randall	Cultural Resources	13
Katie Renwick	Asst. Regional Planner	3
Cam Thomas	Fisheries	28
Scott Williams	Air Quality	37
Dan Woods	Engineering	12

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## Agencies/Organizations/Persons to Whom FEIS Sent

This FEIS has been electronically distributed to individuals who specifically requested a copy of the document. In addition, copies have been sent to other federal agencies, federally recognized tribes, state and local governments, libraries, and organizations.

The FEIS and appendices and the 2021 Land Management Plan and appendices have been posted to the forest website [www.fs.usda.gov/goto/hlc/forestplanrevision](http://www.fs.usda.gov/goto/hlc/forestplanrevision). An email notification of the documents availability on the website was sent to over 35,000 addresses on our electronic mailing list. Postcard notifications were mailed as well.

The following lists the required federal agencies to which the documents or notification of the document's availability were sent.

- Deputy Director USDA APHIS PPD/EAD
- Rural Utilities Service
- National Environmental Coordinator, Natural Resources Conservation Services
- National Agricultural Library, Acquisitions and Serials Branch
- Chief of Naval Operations, Energy and Environmental Readiness Division
- U.S. Army Corps of Engineers, Northwestern Division
- U.S. Environmental Protection Agency, Region 8
- Director NEPA Policy and Compliance, Department of Energy
- Director, Office of Environmental Policy and Compliance, U.S. Department of the Interior
- Division Administrator, Federal Highway Administration

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