Chapter 3. Affected Environment and Environmental Consequences

3.1 Introduction

This chapter presents the existing environment of the HLC NF plan revision area and the potential consequences to that environment that may be caused by implementing the alternatives described in chapter 2. Within each resource section, the boundaries of the area used for the resource analysis are disclosed. The discussions of resources and potential effects use existing information included in the Assessment, other planning documents, resource reports and related information, and other sources as indicated. Where things have changed since the assessment was published, updates have been included.

Numbers such as acres, miles, and volumes are approximate due to the use of geographic information system (GIS) data and rounding.

This DEIS is a programmatic document, disclosing affected environments and environmental consequences at a planning level scale, not at the site-specific project-level scale. Therefore, this DEIS does not predict what would happen each time the proposed plan components are implemented. Land management plans do not have direct effects. They do not authorize or mandate any site-specific projects or activities (including ground-disturbing actions). However, there may be implications, or longer term environmental consequences, of managing the NFs under this programmatic framework. As a result, all effects discussed in this section are considered indirect effects, unless otherwise noted. The environmental effects of those site-specific projects depend on the environmental conditions of each project site, the plan components applied, and implementation.

The affected environment is based in large part upon the assessment, but includes updates and new information that have become available since its printing. The environmental consequences discussions in this chapter allow a reasonable prediction of consequences on the Forest. However, this document does not describe every environmental process nor condition.

3.2 Best Available Scientific Information

The 2012 Planning Rule requires the responsible official to use the best available scientific information (BASI) to inform the development of the proposed plan, including plan components, the monitoring program, and plan decisions. The foundation from which the plan components were developed for the proposed action was provided by the Assessment of the HLC NF, the BASI, and analyses therein. From this foundation, specialists used a number of resources that included peer-reviewed and technical literature, databases and data management systems, modeling tools and approaches, information obtained via participation and attendance at scientific conferences, local information, workshops and collaborations, and information received during public participation periods for related planning activities. Resource specialists considered what is most accurate, reliable, and relevant in their use of the BASI. The BASI includes the publications listed in the literature cited sections of the Assessment and DEIS.

3.3 Regulatory Framework

The Forest will follow all laws, regulations, and policies that relate to managing NFS land. Several important laws and policies form the regulatory framework applicable to managing the HLC NF. The forest plan is designed to supplement, not replace, direction from these sources. Other FS direction, including laws, regulations, policies, executive orders, and FS directives (manual and handbook), are not repeated in the forest plan. The regulatory framework applicable to each resource is included by section, with some of the overarching framework listed below.

3.3.1 Federal law

1895 Agreement with the Indians of the Blackfeet Indian Reservation in Montana: The Blackfeet Tribe retained reserved rights in an area that includes the Badger-Two Medicine Area, in the northern portion of the Rocky Mountain Range GA. These include the right to hunt and fish, subject to the applicable laws of the State of Montana. The federal government has trust responsibilities to Native Americans under a government to government relationship to ensure that the reserved rights are protected.

2012 Planning Rule (36 CFR § 219): Sets out the planning requirements for developing, amending, and revising land management plans for units of the NFS, as required by the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the NFMA of 1976 (16 U.S.C. 1600 et seq). This subpart also sets out the requirements for plan components and other content in land management plans. This part is applicable to all units of the NFS as defined by 16 U.S.C. 1609 or subsequent statute. The planning rule contains detailed requirements that guide the development of the revised forest plan for all resources, and provided the framework for all of the analyses presented in the DEIS. The planning rule can be found at https://www.fs.usda.gov/planningrule.

Antiquities Act of 1906 (16 USC 431) states "That any person who shall appropriate, excavate, injure, or destroy any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned or controlled by the Government of the United States, without the permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated, shall, upon conviction, be fined in a sum of not more than five hundred dollars or be imprisoned for a period of not more than ninety days, or shall suffer both fine and imprisonment, in the discretion of the court." This act also defines the need for a permit for the examination of ruins; excavation of sites and/or the gathering of objects of antiquity on public lands is only to be done by scientific or educational institutions and for the purpose of knowledge, public viewing and permanent preservation.

Bald and Golden Eagle Protection Act prohibits unauthorized take of bald and golden eagles, as defined through subsequent regulations.

Endangered Species Act (ESA) of 1973, as amended: This act provides requirements for federal agencies with regard to species listed under the act. Section 2 requires all federal agencies to "seek to conserve endangered species and threatened species", and Section 7 requires federal agencies to support biotic sustainability by requiring that they utilize their authorities to carry out programs for the conservation of endangered and threatened species; and to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats.

Federal Cave Resources Protection Act of 1988: The purpose of this act is to protect and preserve significant caves and cave resources (including animal and plant life occurring naturally in caves) on federal lands and to foster cooperation and exchange of information between governmental authorities and those who use caves for a variety of purposes. A list of significant caves is to be maintained, and those caves are to be "considered in the preparation or implementation of any land management plan".

Federal Clean Air Act of 1955 (as amended in 1967, 1970, 1977, and 1990): This act requires federal agencies to ensure that actions they undertake in nonattainment and maintenance areas are consistent with federally enforceable air quality management plans for those areas. It provides for the protection and improvement of the nation's air resources and applies to the effects of prescribed fire and can help inform wildfire response. The act is a legal mandate designed to protect public health and welfare from air pollution. Although this policy creates the foundation for air quality regulation, states and counties are often responsible for implementation of the air quality standards. The task of identifying National

Ambient Air Quality Standards is assigned by the Clean Air Act to the Environmental Protection Agency. The Environmental Protection Agency evaluates and updates these standards every 5 years.

Federal Land Policy and Management Act of 1976 (Public Law 94-579, as amended) provides authority to control weeds on rangelands as part of a rangeland improvement program. This act declares (per Sec. 102) that "…the public lands be managed in a manner that…will provide for outdoor recreation and human occupancy and use." Title V authorizes the Secretary of Agriculture to issue permits, leases, or easements to occupy, use, or traverse NFS lands. It directs the United States to receive fair market value unless otherwise provided for by statute and provides for reimbursement of administrative costs in addition to the collection of land use fees (43 U.S.C. 1764(g)). This act is also establishes policy for exchange of lands under uniform procedures and that the lands exchanged be consistent with the prescribed mission of the Agency. This act also defines procedures for the withdrawal of lands from mineral entry. It reserves to the United States the rights to prospect for, mine, and remove the minerals in lands conveyed to others and requires the recordation of claims with the BLM.

Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. 1321(c)(2), 1948, as amended. This law was revised by amendments in 1972 that gave the act its current form and spelled out programs for water quality improvements. Direction is intended to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Sections 303, 319, and 404 apply to forest management. Section 208 of the 1972 amendments mandates identification and control of non-point source pollution resulting from silvicultural activities. There are five required elements: 1) Compliance with state and other federal pollution control rules; 2) No degradation of instream water quality needed to support designated uses; 3) Control of non-point source water pollution using conservation or "best management practices."; 4) Federal agency leadership in controlling non-point sources pollution from managed lands; and 5) Rigorous criteria for controlling discharge of pollutants into the nation's waters. 1987 amendments added Section 319 to the act, under which States are required to develop and implement programs to control nonpoint sources of pollution, or rainfall runoff from farm and urban areas, as well as construction, forestry, and mining sites; and Section 303(d), which requires states to identify pollutant-impaired water segments and develop "total maximum daily loads" that set the maximum amount of pollution that a water body can receive without violating water quality standards, a water quality classification of streams and lakes to show support of beneficial uses, and anti-degradation policies that protect water quality and stream conditions in systems where existing conditions exceed standards.

Forest and Rangelands Renewable Resources Planning Act (1974) provides for the maintenance of land productivity and the need to protect and improve soil and water resources. This act declares (per Sec. 10) that "…the installation of a proper system of transportation to service the NFS ….shall be carried forward in time to meet anticipated needs on an economical and environmentally sound basis…"

Granger-Thye Act of 1950 provides for issuance of grazing permits for a term of up to 10 years. It also provides for the use of grazing receipts for range improvement work. Section 7 authorizes special-use permits not to exceed 30 years duration for the use of structures or improvements under the administrative control of the FS and for the use of land in connection therewith, without acreage limitation.

Migratory Bird Treaty Act of 1918 and Executive Order 13186: This act provides for conservation of migratory birds, through prohibition of unauthorized take as defined through subsequent regulations. In a 2008 MOU (USDA-USFWS, 2008) with the USFWS, the FS agreed to "address the conservation of migratory bird habitat and populations when developing, amending, or revising management plans for NFs and grasslands, consistent with the NFMA, ESA, and other authorities."

Multiple-Use Sustained-Yield Act of 1960: This act confirms the FS' authority to manage the NFs and grasslands "for outdoor recreation, range, timber, watershed, and wildlife and fish purposes" (16 U.S.C. § 528) and does so without limiting the FS' broad discretion in determining the appropriate resource

emphasis or levels of use of the lands of each NF and grassland. The Act states that renewable surface resources (such as forests) shall be administered for multiple use and sustained yield to best meet the needs of the American people without impairment of the productivity of the land.

National Environmental Policy Act of 1969: This act requires that all environmental analyses consider a full range of reasonable alternatives to a proposed action. Reasonable alternatives are those that address the significant issues and meet the purpose and need for the proposed action. Requires analysis of projects to ensure the anticipated effects upon all resources within the project area are considered prior to project implementation (40 CFR § 1502.16). This act declares that it is a federal policy to "preserve important historic, cultural, and natural aspects of our national heritage". It requires federal agencies to use a systematic and interdisciplinary approach that incorporates the natural and social sciences in any planning and decision making that may impact our environment.

National Forest Management Act (NFMA) of 1976: Requires NFs and grasslands to create land management plans. The Act directs the FS to manage for a diversity of habitats to support viable populations. This act directs consultation and coordination of NFS planning with Indian tribes. This act states that the Secretary of Agriculture shall "promulgate regulations" under the principles of the Multiple-Use Sustained-Yield Act of 1960, to "provide for the diversity of plan and animal communities based on the suitability and capability of the specific land area", and to maintain tree species diversity within the context of multiple-use objectives. It directs that NFS lands shall be maintained in appropriate forest cover with species of trees, degree of stocking, rate of growth, and conditions of stand designed to secure the maximum benefits of multiple use sustained yields.

National Forest Roads and Trails Act of 1964 (16 U.S.C. 532-38): This act authorizes road and trail systems for the NFs. This act declared that an adequate system of roads and trails be constructed and maintained to meet the increasing demand for recreation and other uses. This act authorizes the Secretary of Agriculture to grant temporary or permanent easements to landowners who join the FS in providing a permanent road system that serves lands administered by the FS and lands or resources of the landowner. It also authorizes the grant of easements to public road agencies for public roads that are not a part of the federal-aid system. It authorizes imposition of requirements on road users for maintaining and reconstructing roads, including cooperative deposits for that work.

National Trails System Act of 1968 (P.L. 90-543, 82 Stat.919, as amended): This act establishes the National Trails System and authorizes planning, right-of-way acquisition, and construction of trails established by Congress or the Secretary of Agriculture. The purpose 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. 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. Through designation, these trails are recognized as part of America's National Trail System.

- **National Parks and Recreation Act of 1978** (Public Law 95-625)**:** This law amended the National Trails System Act of 1968 (Public Law 90-543) to include National Historic Trails.
- **Continental Divide National Scenic Trail Act (S.2660 — 95th Congress (1977-1978)): A**mends the National Trails System Act to establish the Continental Divide National Scenic Trail within Federal lands located in Montana, Idaho, Wyoming, Colorado, and New Mexico. Directs the Secretary of Agriculture to consult with relevant State and Federal officials in the administration of the lands designated under this act.

Organic Administration Act of 1897 (16 U.S.C. 477-482, 551)**:** Provides the main statutory basis for the management of forest reserves. States that the intention of the forest reserves (which later were called national forests) was to "improve and protect the forest" and to secure "favorable conditions of water

flows" and provide a "continuous supply of timber for the use and necessities of citizens of the United States." This act also authorizes the Secretary of Agriculture to designate experimental forests and ranges. This act is the basic authority for authorizing use of NFS lands for other than rights-of-way.

Secure Rural Schools and Community Self-Determination Act of October 30, 2000 (P. L. 106-393, 114 Stat. 1607; 16 U.S.C.500 note): This act provides provisions to make additional investments in, and create additional employment opportunities through, projects that improve the maintenance of existing infrastructure, implement stewardship objectives that enhance forest ecosystems, and restore and improve land health and water quality. This act was designed to stabilize annual payments to state and counties containing NFS lands and public domain lands managed by the BLM. Funds distributed under the provisions of this act are for the benefit of public schools, roads, and related purposes.

Sikes Act of 1960 provides for carrying out wildlife and fish conservation programs on Federal lands including authority for cooperative State-Federal plans and authority to enter into agreements with States to collect fees to fund the programs identified in those plans. The act states that FS policies recognize the fact that state agencies and Indian tribes are responsible for management of animals, whereas NFs manage wildlife habitats in cooperation with those entities.

Wilderness Act (1964) (16 U.S.C. 1131-1136): This act provides the statutory definition of wilderness and management requirements for these congressionally designated areas. This act established a National Wilderness Preservation System to be administered in such a manner as to leave these areas unimpaired for future use and enjoyment as wilderness. Both the Bob Marshall and the Gates of the Mountains Wilderness Areas were established by this law. The act identified management goals related to airsheds in wilderness. It also provides that livestock grazing, and the activities and facilities needed to support grazing, are allowed to continue when such grazing was established before the wilderness was designated. Subject to valid rights existing prior to January 1, 1984, wilderness areas are withdrawn from all forms of appropriation and disposition under the mining and mineral leasing laws. The act provides for reasonable access to valid mining claims and other valid occupancies inside wilderness. It establishes requirements for special use authorizations in designated wilderness areas for temporary structures, commercial public services and access to valid mining claims and non-federal lands.

3.3.2 Regulation and policy

All resources have numerous applicable FS manuals and handbooks that are part of the regulatory framework for analysis. These manuals and handbooks provide resource management direction that would be followed under any alternative. Additional details for manuals and handbooks that were specifically referenced in the resource analyses are provided in the regulatory framework sections of the specialist reports, but are not included in the body of the DEIS or the literature cited appendix. Where language from manuals and handbooks are cited within the resource sections below, they are noted as FSM (Forest Service manual) or FSH (Forest Service Handbook).

The final Directives for the planning rule, 2015 (FSH 1909.12) applies to all resources and was used to develop the draft revised plan. The analysis for all resources draws upon the guidance provided in this document. The directives can be found at: https://www.fs.usda.gov/planningrule.

All FS manuals can be obtained at https://www.fs.fed.us/im/directives/dughtml/fsm.html.

All FS handbooks can be obtained at https://www.fs.fed.us/im/directives/dughtml/fsh_1.html.

3.4 Monitoring plan

Under all action alternatives, monitoring would occur as listed in appendix A of the Draft Plan. The monitoring elements are designed to enable the Forest to determine if a change in plan components or

other plan management guidance may be needed, forming a basis for continual improvement and adaptive management. The monitoring plan would have the effect of improving the HLC NF's ability to move toward the desired conditions for each resource area, by providing the information needed to assess change through time and support adaptive management actions.

The 1986 plans (alternative A) also included detailed monitoring plans. These 1986 monitoring plans are different than what is included in the action alternatives of this DEIS, although some elements are similar. In general, the monitoring plan under the action alternatives would better provide the information needed to inform adaptive management and ecosystem integrity than the no-action alternative.

The monitoring plan included in the action alternatives would impact each resource area as follows:

- Aquatic ecosystems monitoring would reduce uncertainty related to the impacts of forest management on instream physical habitat, wetlands, riparian management zones, and soil productivity; and reduce uncertainty in the expected effects of climate and disturbance regimes.
- Air quality-monitoring would demonstrate whether air quality is maintained per law and policy.
- Fire and fuels monitoring would improve our understanding of the role fire plays on the landscape; reduce uncertainty surrounding the expected effects of climate on fire processes; and demonstrate the efficacy of hazardous fuel reduction treatments to help improve fuel management strategies.
- Terrestrial vegetation monitoring would demonstrate whether vegetation conditions trend toward the desired conditions; improve our understanding of whether vegetation conditions and habitat can support the natural diversity of plant and animal species ("coarse filter"); reduce uncertainty surrounding the expected effects of climate and disturbances on terrestrial vegetation; demonstrate the efficacy of treatments to improve vegetation resilience; and improve our understanding of the health and condition of specific vegetation communities.
- Old growth, snags, and downed wood monitoring would demonstrate whether these attributes are maintained at desired levels, and reduce uncertainty related to the impacts of forest management, climate, and disturbances on these key habitat elements.
- Plant species at risk monitoring would determine if habitat conditions support the recovery and persistence of at-risk plant species, determine which species require at-risk plant status, and reduce the uncertainty associated with the location and status of rare plant species. Whitebark pine monitoring would demonstrate the ability of the forest to contribute to the recovery of this candidate species.
- Pollinator monitoring would reduce the uncertainty surrounding the abundance and condition of habitat available to support pollinators.
- Invasive plant monitoring would improve our understanding of the extent of nonnative plant species on the forest and reduce uncertainty in the efficacy of invasive plant treatments as well as the impacts of invasive plant treatments on plant species at risk.
- Monitoring related to wildlife habitat would improve our understanding of the trend in and impacts of forest management on habitat for at-risk species; demonstrate the efficacy of specific management actions to reduce human-wildlife conflicts and to maintain specific habitat conditions of interest; improve our understanding of the impacts of forest management on habitat connectivity at some scales; and improve our understanding of how habitat conditions on NFS lands may influence opportunities to hunt some big game species.
- Recreation setting monitoring would demonstrate the progress on moving toward desired recreation opportunity spectrum settings.
- Recreation opportunity monitoring would improve our understanding of the concept of sustainable recreation; reduce uncertainty of the future condition and status of recreation sites and facilities; and improve our understanding of the social and economic contributions of recreation opportunities.

- Recreation special use monitoring would demonstrate the status of recreation special use permits over time.
- Scenic character monitoring would demonstrate the progress on moving toward desired scenic integrity objectives.
- Designated area monitoring would reduce uncertainty regarding whether wilderness character is maintained in designated wilderness and RWAs over time; whether the outstanding remarkable values of eligible wild and scenic rivers are maintained over time; and if nationally designated trails including the Continental Divide National Scenic trail meet the desired conditions for access and maintenance.
- Cultural, historical, and tribal areas of importance monitoring would demonstrate whether progress is made toward the preservation and conservation of significant cultural resources.
- Lands monitoring would demonstrate the degree to which road and trail easements are established.
- Infrastructure monitoring would improve our understanding of the status and condition of the transportation system.
- Public information, interpretation, and education monitoring would demonstrate the extent to which the Forest provides opportunities for the public to connect with the natural resources on the Forest.
- Livestock grazing monitoring would reduce the uncertainty regarding the efficacy of livestock grazing management actions to move rangelands and riparian areas toward desired conditions.
- Timber and other forest products monitoring would demonstrate the degree to which the Forest contributes timber and other forest products to the local community; improve our understanding of the influences of natural disturbances on lands suitable for timber production; and demonstrate the degree to which timber harvest contributes to desirable patch sizes on the landscape.
- Fish and wildlife monitoring would demonstrate the degree to which habitat conditions and management actions on the forest support wildlife and fish related activities; and improve our understanding of the public demand for those opportunities.

3.4.1 Focal species

Two focal species have been selected for monitoring under all action alternatives, which would help improve the Forest's understanding of the integrity of several key ecosystems. The monitoring questions, indicators, and measures are specified in appendix A of the draft plan.

Limber pine

Limber pine (*Pinus flexilis*) has been selected as a focal species to help assess the ecological integrity of xeric ecotone plant communities, which encompass the transition between low elevation grass/shrublands and dry conifer forests. Limber pine is unique in that it spans the elevational gradient across the HLC NF and is also present in some alpine ecotones as an associate with whitebark pine. Ecotone plant communities are of interest due to their vulnerability to climate change, sensitivity to disturbance regime shifts, importance to wildlife, and because they support at-risk plants. Threats to these ecosystems include climate change, fire suppression, mountain pine beetle, and white pine blister rust. Monitoring limber pine with the action alternatives would help decrease the uncertainty regarding expected trends of ecotone communities over time, and inform potential needs for adaptive management.

Westslope cutthroat trout

Westslope cutthroat trout (*Oncorhynchus clarki lewisi*) has been selected as a focal species for monitoring to help assess the habitat integrity of cold water native fisheries. These fisheries provide important habitat for aquatic species, and key habitat elements include connectivity, shade and woody structure. Threats to these habitats include wildfire, climate change, sedimentation, nonnative aquatic species, and livestock grazing. The HLC NF is actively working to restore genetically pure native cutthroat trout populations

east of the Continental Divide. Monitoring for this species under the action alternatives would not only help evaluate and inform restoration efforts, but would improve our understanding of the integrity of cold water fisheries in general in light of the uncertain impacts of climate change and other stressors.

3.5 Aquatic Ecosystems

3.5.1 Introduction

This section considers numerous physical and biological resources such as: water quality, native and non-native desirable species, and aquatic habitats. Managing for high quality soil, water and hydrologic function are fundamental in maintaining and restoring watershed health. Soil is the primary medium for regulating the movement and storage of energy and water and for regulating cycles and availability of plant nutrients (ICBEMP, 1997). The physical, chemical, and biological properties of soils determine biological productivity, hydrologic response, site stability, and ecosystem resiliency.

Analysis Area

The analysis area for the watershed, soils and aquatic species include all the lands within the boundary of the HLC NF and connected waterways. The connected river systems are included because migratory bull trout and westslope cutthroat trout that emerge from forest streams move downstream to reach sexual maturity and then return to their natal streams to complete the spawning cycle and depend on connectivity for their survival.

The Forest Plan area is located within two hydrologic unit code (HUC) regions:

- The Missouri Region (HUC = 10) is on the eastern side of the Continental Divide. Within this region, the plan area is located in 3 subregions: Missouri Headwaters (HUC=1002), Missouri-Marias (HUC=1003), and Missouri-Musselshell (HUC=1004). Within these subregions, the plan area is located in 14 fourth level watersheds. Within these fourth level watersheds the plan area is located within 88 fifth level watersheds which are further broken down into 301 sixth level watersheds.
- The Pacific Northwest Region (HUC = 17) drains to the west. Within this region, the plan area is located in one subregion, the Kootenai-Pend Oreille- Spokane (HUC=1701). Within this subregion, the plan area is located in two fourth level watersheds: Upper Clark Fork and Blackfoot River. Within these fourth level watersheds, the plan area is within 16 fifth level watersheds which are further broken down into 72 sixth level subwatersheds.

The analysis scale varies by resource and uses the fourth, fifth and sixth level watershed scales to assess current conditions across the HLC NF.

The FS commonly evaluates how proposed management activities meet the requirements of the Clean Water Act from a holistic perspective that considers land management activities occurring throughout the watershed and their effects on water quality and aquatic habitat integrity. The goal of the Clean Water Act is “to restore and maintain the chemical, physical, and biological integrity of the nation’s water”. Listings of waterbodies and development of Total Maximum Daily Loads (TMDLs) under Section 303(d) of the Act are symptomatic of the effects from historical and some ongoing management activities. Maintaining healthy watersheds and restoration of degraded watersheds would contribute towards the de-listing of impaired waterbodies and to the survival and recovery of aquatic species.

Productivity of soil and vegetation, proximity to water, and the general attractiveness of riparian and aquatic systems continue to make these areas ideal for many land uses managed by the FS. Conflicts between some human uses and the resources dependent on resilient riparian conditions may continue unless management provides for sufficient land use limitations and resource protection that maintain the