



Executive Summary

Draft Assessment

Lolo National Forest Land Management Plan



We make every effort to create documents that are accessible to individuals of all abilities; however, limitations with our word processing programs may prevent some parts of this document from being readable by computer-assisted reading devices. If you need assistance with any part of this document, please contact the Lolo National Forest at 406-329-3430.

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, American Sign Language, etc.) should contact the responsible agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at <https://www.usda.gov/oascr/how-to-file-a-program-discrimination-complaint> and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: program.intake@usda.gov. USDA is an equal opportunity provider, employer, and lender.

Draft Assessment

Lolo National Forest Land Management Plan

Mineral, Missoula, Sanders, Granite, Powell, Lewis and Clark, and Flathead counties

Lead Agency: USDA Forest Service

Responsible Official: Carolyn Upton
Forest Supervisor
24 Fort Missoula Road
Missoula, MT 59804
406-329-3750

For Information Contact: Amanda Milburn
Plan Revision Team Leader
26 Fort Missoula Road
Missoula, MT 59804
406-329-3430

Cover photo: Rolling hills of arrowleaf balsamroot taken by Maureen Essen.

The Forest Service values public participation. Communications from the public regarding this project, including commenters' names and contact information, will become part of the public record. Comments, including anonymous comments, will be accepted at any time. However, comments posted after the close of a designated comment period may not be able to be given full consideration. Anonymous comments and comments submitted after the close of the final designated comment period will not provide the commenter standing for administrative review. Comments, or in some cases other expressions of interest, along with respondent's contact information, submitted during the comment period may be necessary to establish a respondent's eligibility to participate in an administrative review for this proposed action. Interested members of the public should review the proposal's information to determine the applicable administrative review process and the eligibility requirements for that process.

Send Comments via: Land Management Plan Revision Web Hub
(<https://www.fs.usda.gov/detail/lolo/landmanagement/planning/?cid=fseprd993646>)
Attn: Amanda Milburn-Lolo Plan Revision
Lolo National Forest All Units
24 Fort Missoula Rd., Missoula, MT, 59804

Date Comments Must Be Received: July 8, 2023

Executive Summary

The Lolo National Forest is embarking on the process to revise its land management plan under the 2012 Planning Rule (36 CFR 219.19). This draft assessment is a rapid evaluation of relevant existing conditions, status, and trends on the Lolo National Forest and represents the first stage in the plan revision process. This document is structured into three chapters:

- Chapter 1: Overview and Assessment Background.
- Chapter 2: Assessment Findings: Biophysical Elements.
- Chapter 3: Assessment Findings: Socioeconomic Elements and Multiple Uses.

This executive summary provides a brief overview of the content of the draft assessment for the Lolo National Forest as follows. Refer to chapters 1, 2, and 3 for more detailed information.

Forest Setting

The Lolo National Forest is located in western Montana (Figure ES.1). This area is important to many people based on the many distinctive roles and contributions it provides in the context of the broader landscape, including but not limited to a variety of recreation opportunities, diverse natural landscapes and ecosystems, and economic importance to both urban and rural communities. The Lolo is an area of importance for multiple Federally recognized Indian Tribes. It is home to many native plant, aquatic, and wildlife species, including some that are at-risk. We have identified eight major landscape areas, or geographic areas, that are relevant for describing conditions on the Lolo: Clearwater Upper Blackfoot, Greater Missoula, Lolo Creek, Lower Clark Fork, Middle Clark Fork, Ninemile/Petty Creek, Rock Creek, and Saint Regis.

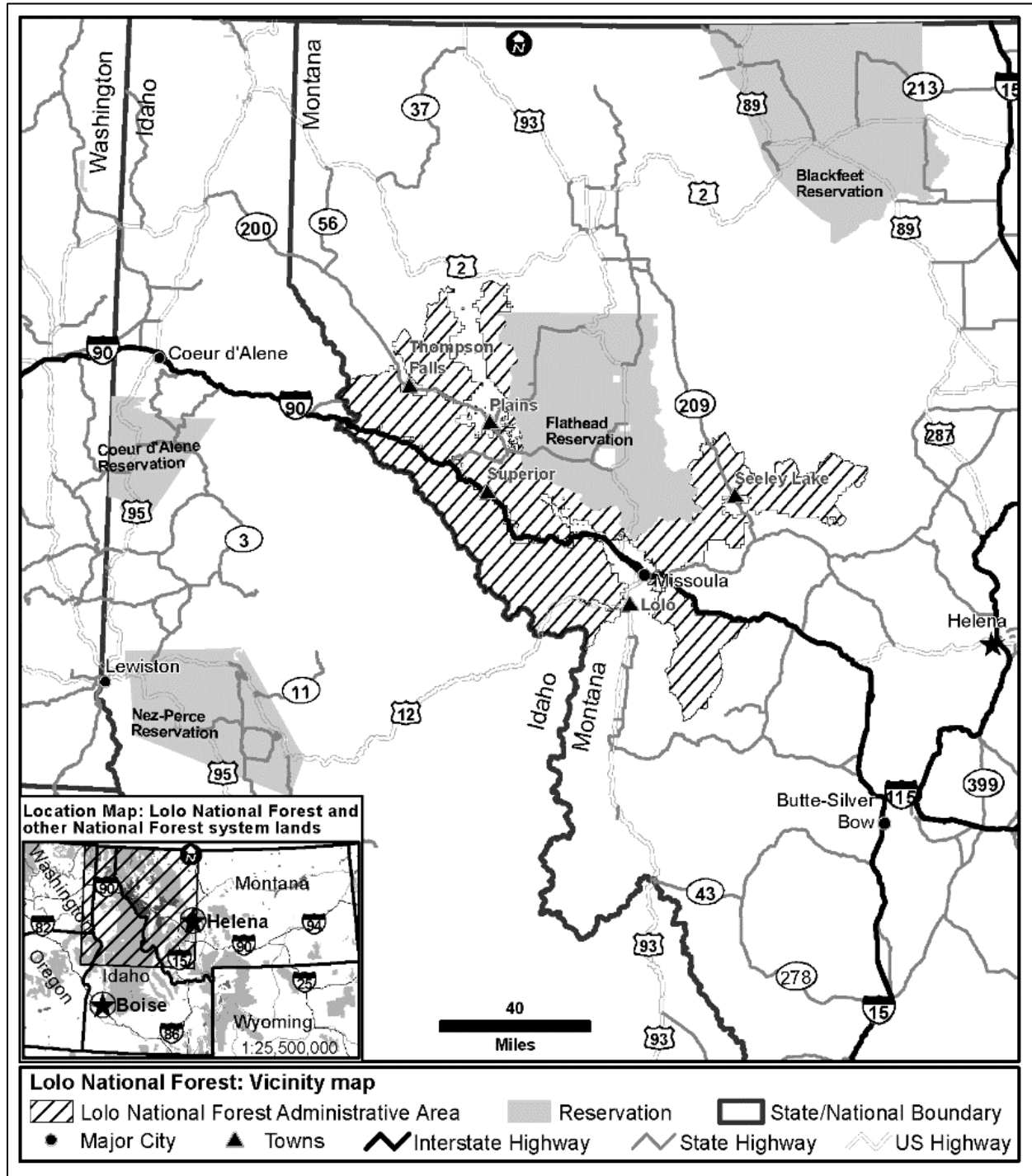


Figure ES.1—Lolo National Forest Vicinity Map

Distinctive Roles and Contributions

The Lolo National Forest’s distinctive roles and contributions within the broader landscape describe the roles for which the plan area is best suited, considering the Agency’s mission, the unit’s unique capabilities, and the resources and management of other lands in the vicinity. We compiled the draft distinctive roles and contributions based on internal input, materials developed during development of the

2006 draft plan, and based on public input during workshops held in February of 2023. In chapter 2 of the draft assessment, we identify distinctive roles and contributions for aquatic and riparian ecosystems, terrestrial ecosystems, native species diversity, cultural and historic resources, the wildland urban interface, sustainable recreation and scenery, lands and infrastructure, designated areas, forest goods and services. We also provide detail on specific distinctive roles provided by each geographic area.

Assessment Background and Process

The Lolo's current Forest Plan was established in 1986. This draft assessment is a rapid evaluation of relevant existing conditions, status, and trends on the Lolo National Forest and represents the first stage in the plan revision process under the 2012 Planning Rule. In this document, we compile information on the fifteen topical areas presented in the land management planning handbook that is relevant to the Lolo National Forest (FSH 1909.12.10 (11)(b)).

The Lolo National Forest issued a Notice of Intent to Prepare an Assessment and Initiate Plan Revision on March 16, 2023. Beginning in January of 2023, revision team staff and Forest leadership held an array of public engagement activities designed to gather input on the draft assessment. The assessment is designed to evaluate and present existing information about relevant ecological, economic, and social conditions; trends and sustainability; and associated relationships to the land management plan. The assessment sets the stage for the integrated approach to be taken in land management planning, as emphasized in the planning regulations.

The 2012 Planning Rule requires the responsible official to use the best available scientific information to inform the development of a revised plan. The foundation of scientific information from which the plan components will be developed is provided by the assessment. The best available scientific information is represented by the collective body of information used and is reflected in the literature cited section. The team relied on the definition of best available scientific information found in the 2012 rule, including the primary criteria of accuracy, reliability, and relevancy. Additional information may be gathered as it becomes available, and from continued public engagement.

The geographic scope of this assessment includes all lands in the administrative boundary of the Lolo National Forest, as well as consideration for conditions on surrounding lands. The draft assessment has been prepared prior to the identification of the need to change to ensure the relevant information is gathered to inform the plan development process. The timeframe considered in the assessment includes the status and trends that have occurred under the existing 1986 Forest Plan. Where relevant, some resource areas are assessed using a much longer timescale into the past for reference. In addition, the assessment includes information related to likely future trends.

Public Engagement, Coordination, and Cooperation

The Lolo National Forest and the plan revision team began public engagement for the assessment in December of 2022. The team asked the public how they would like to be engaged and developed a public engagement and participation strategy. The goal of public engagement is to immediately and continually set a tone of broad and transparent engagement, in recognition of the wide array of interests involved in plan revision. Engagement events thus far have reached a diverse audience, and interest in the Lolo Plan Revision continues to grow.

In historic times, the Salish, Pend d'Oreille, and Kootenai permanently occupied the area now encompassed by the Lolo National Forest. Members of the Salish, Nez Perce, Coeur d'Alene, Pend d'Oreille, Kootenai, Blackfeet, and Shoshone groups used or passed through this area. The Forest borders

three sides on what is now the Flathead Indian Reservation. American Indian tribes are sovereign nations. Through treaties, tribes have reserved rights and privileges for their tribal members on off-reservation lands ceded to the U.S. Government. Forest Service leadership and staff approached Federally recognized Indian Tribes with a potential interest in the Lolo plan revision early in the pre-assessment phase and are committed to ensuring that the agency's trust responsibilities are a key focus of the revision process, and to ensure that indigenous traditional ecological knowledge is incorporated into the planning process. Federally recognized Indian Tribes that have expressed interest in the management of the Lolo National Forest include the Confederated Salish and Kootenai Tribes, the Blackfoot Tribe, the Coeur d'Alene Tribe, the Nez Perce Tribe, and the Shoshone Bannock Tribe.

Due to its central geographic location, the Lolo National Forest overlaps or is adjacent to a variety of other agency jurisdictions as well, including state, county, and other federal agencies. To involve and cooperate with all agencies, an Interagency Governmental Working Group has been formed. The purpose of this group is two-fold: first, to encourage interagency understanding and dialogue to foster an all-lands approach; and second, to ensure all impacted agencies have the information needed to provide meaningful comment to the revision process.

In addition, several county and State agencies and one tribal government have thus far requested cooperating agency status for the Lolo plan revision NEPA process. Memorandums of understanding have been developed with each agency to identify the areas of specialized expertise they will provide to the revision process. Thus far, cooperating agencies for the Lolo Plan Revision include—

- The Confederated Salish and Kootenai Tribes;
- Mineral County;
- Montana Department of Natural Resources and Conservation; and
- Montana Department of Fish, Wildlife, and Parks.

Assessment Findings: Biophysical Elements

Ecosystem Drivers and Stressors

Broadly, ecosystem drivers are the dominant ecological or human-influenced processes that shape the ecosystem. For the purposes of land management planning, stressors are those factors that may directly or indirectly degrade or impair ecosystem composition, structure, or ecological process in a manner that may impair its ecological integrity (36 CFR 219.19). Drivers may be considered synonymous with stressors, although drivers do not necessarily impair ecological integrity. In fact, some drivers are necessary to support ecosystem integrity. Some drivers may become stressors when they occur outside of the frequency, severity, or extent than what is expected in the natural range of variation. Many drivers and stressors that impact ecosystem conditions are related to natural disturbances or influences, while others are anthropogenic in nature. Many drivers and stressors interact with each other to create complex effects and feedback loops and can impact social and economic sustainability as well as ecological sustainability.

Climate Change

Climate change causes many direct alterations of the local environment, such as changes in temperature and precipitation, and it has indirect effects on a wide range of ecosystem processes (Vose et al. 2012). The Northern Rockies Adaptation Partnership (Halofsky et al. 2018b;a) and Lolo Watershed Climate Change Vulnerability Assessment (Wade et al. 2016) indicate that a warming climate will rarely be the direct agent of change for ecosystems on the Lolo National Forest. Rather, most of the changes will likely result from responses to climate change-induced disturbance or to some combination of other climate-exacerbated stressors.

Fire

Fire is a natural process for the ecosystems on the Lolo National Forest, and many are started by lightning. Humans have also been a source of fire on the landscape for centuries and have influenced vegetation successional dynamics. Fire plays innumerable ecological functions, including driving species structure and composition, carbon and nutrient recycling, snag and tree cavity creation, and stimulating seeding and sprouting of vegetation. Wildfire was active up until 1939. Fire activity decreased in 1920, coinciding with effective fire suppression influenced by a mild climatic period. Starting in 1985, the combined effects of fire exclusion and accelerated climate change has fueled a shift in fire regimes of various forest types, with increases in area burned. The amount of fire since 1985 in infrequent and very infrequent fire frequency classes have approached minimum levels of historical fire. However, acres burned in the moderately frequent, frequent, and very frequent classes has not approached the minimum amount of historical burning.

Insects and Disease

Current conditions on the Lolo National Forest are conducive to insect infestations, based on climatic conditions and widespread susceptibility of forests following nearly a century of disturbance exclusion. Hot, dry summers are promoting forest vulnerability that has increased the probability of insect eruptions and potential for compounding disturbances. Novel instances of secondary insect pests causing damage, exotic insect colonization, and pests occurring in new geographic locations are occurring. Forest insects and disease have had a major impact on the composition and structure; this trend is expected to continue.

Beaver

Beavers are a keystone species that historically were responsible for some of the greatest biodiversity and ecological systems on the Lolo National Forest. Beavers were likely as formative to of a disturbance agent to valley bottom ecosystems as wildfires and floods. Although beaver populations are rebounding, levels remain far below potential. Consequently, valley bottoms and the extent of riparian vegetation are heavily departed from potential ecological conditions and services. Because beavers are a very large, but mostly missing, disturbance agent on the landscape, understanding beaver habitat potential along with potential riparian habitat is essential in forest management considerations of valley bottom ecosystems and perennial and intermittent stream corridors.

Flooding, Stream Flows, and Groundwater

The relationship between mountainous areas, snowpack accumulation, and runoff cause National Forest System lands to function like reservoirs for downstream communities, ecosystems, and economies. Research suggests that climate change may shift the timing of snowmelt and peak flows to earlier in the year in Western Montana Watersheds. Local gage data suggests that a shift toward earlier runoff and peak flows may already be occurring on Lolo National Forest. As timing of stream flow shifts due to climate change, water scarcity may become an issue for maintaining stream flows to support aquatic life and surrounding communities (Wade et al. 2016).

Invasive Species

Invasive species include plants (such as state and county designated noxious weeds), vertebrates (such as feral swine), invertebrates (such as emerald ash borer, non-native mussel larvae, New Zealand mudsnail), and pathogens (such as blister rust). Invasive species tend to spread aggressively as they lack the natural controls that may have evolved within their native ranges. As a result, they can displace native species, change hydrology and microclimatic features, increase soil erosion, alter wildfire intensity and frequency, and generally disrupt natural processes and reduce overall native community diversity.

Mining

The Lolo National Forest has a long history of mining and mineral development across and adjacent to the administrative boundary. Legacy mining has resulted in environmental impacts that now comprises an important component of the forest's program of rehabilitation work involving substantial partner cooperation and coordination. Administration of mining activity under the 1986 plan in tandem with other relevant regulatory authorities has limited the magnitude and extent of resource adverse resource effects.

Livestock Grazing

Capable and suitable rangelands are limited on the Lolo National Forest. Challenges to managing livestock include maintaining resilient productive rangeland ecosystems with associated multiple-uses and climate variables. Since the 1950's, grazing use has generally been declining. Improper livestock grazing can have numerous direct and indirect effects to soil, vegetation, and riparian function; however, current management of livestock grazing seeks to maintain the ecological integrity of rangeland ecosystems.

Forest Vegetation Management

Forest vegetation management actions are drivers of vegetation change and influence vegetation conditions trends at both the stand-level and landscape-scale depending on the type of treatment, the spatial extent and placement of those treatments. Forest vegetation management is used to meet multiple resource objectives including providing for jobs and wood products to communities; improving forest health, vigor, and productivity; and providing for vegetation diversity. Relative to other ecosystem drivers

such as insects and disease or wildfire, vegetation management has a relatively small footprint on the Lolo National Forest. However, vegetation management remains an effective tool for achieving desired vegetation conditions in key areas and can have meaningful landscape-scale restoration impacts.

Recreation

Recreational use of national forests is diverse with great opportunities and increasing demand. Many ecosystem services are needed to provide such a wide array of interests and experiences to meet public expectations and demands. Some recreational uses create very little impact on forest and aquatic ecosystems, and others can be very impactful with substantive management challenges.

Infrastructure

Roads, trails, and recreation infrastructure provide mechanisms for people to access and enjoy the National Forest. The road network also facilitates land management activities. Infrastructure is likely one of the most prominent threats to watersheds and aquatic ecosystems. Examples of stressors are barriers to aquatic organism passage, water quality issues caused by erosion and sedimentation, encroachment on stream and floodplain structure and functions, large wood loss, shade loss, and vegetation trampling.

Terrestrial Ecosystem Integrity

As required by the 2012 Planning Rule, terrestrial ecosystems are assessed using the concept of ecological integrity as a guiding framework. The rule defines ecological integrity as the quality or condition of an ecosystem when its dominant ecological characteristics occur within the natural range of variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influence (36 CFR 219.19). The 2012 Planning Rule explicitly puts the natural range of variation at the core of assessing ecological integrity. It is assumed that maintaining ecosystems within the natural range of variation will provide resilience.

A natural range of variation modeling analysis was conducted to inform the assessment. Potential vegetation was used as the primary means of defining and mapping terrestrial ecosystems. The most common potential vegetation types on the Lolo National Forest are Warm Dry and Cool Moist Forests. Specific key ecosystem characteristics representing ecological function, composition, structure, and connectivity have been identified for each ecosystem. Eighteen distinct ecosystems have been assigned an estimated levels of ecosystem integrity. Many of these ecosystems are at moderate or high integrity; however, eight ecosystems are currently estimated have a low or poor level of ecosystem integrity.

Coniferous Forest Ecosystems

Key ecosystem characteristics identified for conifer forest ecosystems include cover type, size class, large-tree structure, density class, old growth, and snags. Forestwide findings and trends, largely informed by the natural range of variation analysis for these characteristics include:

- At lower elevations, where frequent fire regimes are most disrupted, forests have experienced a shift from early seral, fire-dependent species such as larch and ponderosa pine, to more shade tolerant and less fire-resistant species.
- Open canopy forests are less prevalent on the landscape than they were historically, while closed canopy forests (greater than 60% canopy cover) are more prevalent. Pole-sized forests (those with an average diameter of 5-10 inches) are more common today whereas the very large size class (greater than 20 inches average diameter) are underrepresented on the landscape.

- Old growth is estimated to occur on approximately 8% of the Lolo National Forest and has shown an overall slight downward trend since 2008, particularly in Warm Dry Forest ecosystems. It is likely that old growth is less abundant than it was historically. Large-tree structure is present on approximately 21% of the Forest and has showed a static trend in recent years.
- Medium snags are the most prevalent on the landscape; relatively few large or very large snags are present. Large snags tend to occur in the Cool Moist Forests. The Warm Dry Forest ecosystem often has a more even distribution of snags into later seral stages because of a more frequent, less severe fire regime.

Warm Dry Forest. At lower elevations, the ecological integrity of the Warm Dry Forest ecosystem is low. On these sites, there is potential for conversion to nonforest due to the combined effects of exotic species and reduced natural tree regeneration as the climate gets warmer and drier. Further, the introduction of invasive species has compromised the provision of wildlife habitat. At higher elevations with more productive forest types, ecological integrity of the Warm Dry Forest is moderate. In these forests, the reduced frequency of low severity fires and management legacies have led to denser forests with fewer large trees and a more shade-tolerant species composition. These changes have led to forests that are less resilient and more prone to large, stand-replacing disturbances. However, natural regeneration is less of a concern here compared to lower tree line communities. Across Warm Dry Forests, the potential to increase ecological integrity through active management is high due to the potential to implement restoration treatments.

Warm Moist Forest. The ecological integrity of the Warm Moist Forest ecosystem is low. Over a century of fire suppression has increased shade tolerant species and the potential for stand-replacing disturbance events and simultaneously reduced the recruitment of large trees and early seral species. Moreover, climatic trends are projected to lead to more drought stressed trees and more frequent high severity fire, thereby further reducing the resiliency. The increased potential for large-scale, high severity fire threatens ecosystem services associated with productive environments with low fire return intervals including long-term carbon storage and the maintenance of unique wildlife habitat such as large snags with big cavities. The potential for management to help restore this ecosystem is high. Restoration of western larch and complex in-stand and landscape forest structure can improve ecological integrity. Although limited in extent, restoration of white pine can also occur by planting blister rust-resistant seedlings.

Cool Moist Forest. Ecological integrity in the Cool Moist Forest ecosystem is currently moderate. This ecosystem is highly productive and relatively resilient to stressors. Because of greater water availability, there is little risk of type conversion. However, in the long-term, the interaction of climate change, invasive species, and disease (such as blister rust and root rot) does present a risk to the long-term sustainability of this ecosystem and its associated ecosystem services. The potential for management to help restore this ecosystem is moderate. Actions such as invasive species management, planting early seral species, and reintroducing heterogeneity through use of fire and timber harvest can help restore this system. Nevertheless, provision of ecological services related to water quantity and quality may be compromised if climate change results in reduced snowpack storage and regulation.

Cold Forest. Ecological integrity for the Cold Forest ecosystem, in general, is moderate. However, whitebark pine ecosystems, a subset of the Cold Forest ecosystem that is found on cold dry sites, is rated as low. Whitebark pine decline is causing a downward trend in overall biodiversity and creating a vulnerable state for Cold Forest ecosystems. Ecosystem services such as the availability and quality of clean water is compromised with climate change induced reduction of snowpack and the effects flow downstream to lower elevation ecosystems. The potential for management to help restore this ecosystem is low to moderate and may include a variety of whitebark pine restoration activities.

Nonforest Ecosystems

Findings and trends for nonforested ecosystems include:

- The ecological integrity of xeric grasslands is low. The ecological integrity of mesic grasslands increases with increasing elevation and is low to moderate. Composition of xeric and mesic grasslands has been altered by persistent livestock grazing and fire suppression. Invasive species are a major threat in valley bottoms and montane settings. Invasive species management has been focused on existing infestations with no comprehensive inventory or monitoring program.
- Xeric shrublands on the Lolo National Forest are uncommon and mostly consist of mountain big sagebrush communities at montane and subalpine locations. Their ecological integrity is moderate. Major stressors are increasing fire frequency and severity and invasive annual grasses.
- Mesic shrublands are uncommon on the Lolo National Forest. Their ecological integrity is rates as moderate. These systems are well adapted to a variety of disturbances. However, they may be sensitive to persistent and heavy ungulate browsing.
- Alpine potential vegetation types are present on less than 1 percent of the Lolo National Forest. The ecological integrity of alpine ecosystems and other high elevation sparsely vegetated ecosystems is high. A major stressor is climate change with warming temperatures and changes in timing and length of snow cover. Most sparsely vegetated ecosystems at high elevations are not substantially altered from historical conditions because they have low levels of human accessibility. The ecological integrity of sparsely vegetated ecosystems at lower elevations is moderate. Here, sparsely vegetated ecosystems may be at risk for invasion by non-native species with potential changes to fuel accumulation and fire behavior.

Aquatic, wetland, and riparian ecosystem integrity

Valley Bottoms, Stream Habitat, and Associated Riparian Systems

Valley bottoms (i.e., river-wetland corridors) were wet, widespread, and ecologically productive in the geologic, prehistoric, and recent past (Wohl et al. 2021). Geology, as well as geomorphic and biotic processes (e.g., beaver, wood jams, and vegetation) are the largest drivers of functional valley bottom integrity, resilience, and ecosystem services. Valley bottoms provide a disproportionate amount of ecosystem services relative to their size. Beavers are a keystone species and major disturbance agent; existing populations and habitat are well below potential. Stream habitat in general is functioning well on the Lolo National Forest and habitat trends exhibit positive trends. However, geomorphologically, most streams are overly simplified because of the loss or degradation of the natural valley bottom. Riparian ecosystems are substantively departed from historic conditions with respect to riparian vegetation presence, extent, and species diversity.

Intermittent Streams

Intermittent and ephemeral streams are watercourses or stream segments that flow periodically. Intermittent and ephemeral streams comprise over half of the stream channel networks on the Lolo; they provide many ecosystem services and are important to the diversity of the entire biotic and abiotic systems. The duration and abundance of intermittent flow expression is likely to increase under projected climate scenarios.

Lakes and Reservoirs

There are a variety of natural lakes and man-made reservoirs and ponds on the Lolo National Forest. Higher elevation lake ecosystems have higher ecological integrity than lower elevation systems. Although public use of dispersed recreation sites near mountain lakes is increasing, the lack of access and low-impact nature of dispersed use means the overall status of ecological integrity is high. In addition, the very cold, deep water makes these lakes resistant to the effects of climate change. Lower elevation lakes have moderate ecological integrity because of shoreline development, valley bottom land use practices, and presence of non-native plant and animal species. These factors will continue to be threats in the future as lower elevation lakes are susceptible to climate change and invasion of other non-native species. Lower elevation lakes and reservoir conditions and trends are dominated by non-Federal land use.

Wetlands, Ponds, and Groundwater Dependent Ecosystems

There is high uncertainty about the ecological integrity of many wetland, spring, and groundwater dependent ecosystems. The ecological integrity is likely high for remote, high elevation systems but low to poor at lower elevation. Several fens are protected as Research Natural Areas or Botanical Areas and their integrity is moderate to high. Major stressors are changes to hydrological characteristics including spring developments, water diversions, heavy ungulate trampling and herbivory, and roads. Groundwater dependent ecosystems can be hotspots for biodiversity in an increasingly dry climate. Decommissioning roads adjacent to or within wetlands can improve trends in these ecosystems.

Unique or Rare Ecosystems

Whitebark Pine Ecosystems

The ecological integrity of whitebark pine communities, which are found on cold dry sites in the Cold Forest ecosystem, is low. The primary drivers and stressors in this ecosystem include natural fire, fire exclusion and suppression, climate change, drought, bark beetles, white pine blister rust, and wildlife regeneration mechanisms and dependencies. Whitebark pine may become functionally extinct in some areas due to connectivity issues related to fragmented stands and seed dispersal mechanisms, and the loss of this species fundamentally alters the integrity of these ecosystems. The level of certainty with this finding is high based on a large body of available scientific information. The ability of the Forest Service affect change for the status and trends of this ecosystem is low to moderate. Major management activities related to whitebark pine restoration can include hand thinning, mechanical cutting, prescribed fire, wildfire use, and collecting materials followed by the planting of blister rust resistant whitebark pine. There are greater restoration opportunities associated with prescribed fire and benefits from wildfire to create suitable sites for regeneration.

Western Redcedar Bottomlands

The ecological integrity of western red cedar bottomlands is moderate. Western red cedar bottomlands are compromised by altered hydrological cycles (e.g., water diversion, roads, upland vegetation), altered fire regimes, land use (e.g., acquired industrial timber lands, recreation, road location), timber harvest, and climate change. This ecosystem is expected to deliver major functions and services, including supporting biodiversity and productivity but at a reduced level relative to expectations for this ecosystem. The potential for management to restore western red cedar bottomlands is moderate.

Subalpine Larch

On the Lolo National Forest, subalpine occurs only on Carlton Ridge of Lolo peak. Carlton Ridge provides unique habitat because it escaped past glaciation and soils are unusually well developed

considering the altitude. A portion of the subalpine larch communities on Carlton Ridge are designated as a Research Natural Area. Much of this area burned in 2017 resulting in high severity effects. In addition to losses from disturbance, this species is vulnerable to the effects of climate change. Therefore, although small, the subalpine larch community on Carlton Ridge is important for biodiversity. The ecological integrity of this site is low, due to its small size and the impacts of disturbance.

Aspen Stands

Aspen stands on the Lolo National Forest are small, scattered, and likely remnants of formerly large clones which persisted due to more frequent disturbance by fire and flooding historically. The ecological integrity of aspen stands is rated as moderate. Aspen stands are affected by fire exclusion and ungulate herbivory. Stands at the drier and warmer end of suitable habitat are vulnerable to climate warming. Management actions such as prescribed fire, conifer thinning and fencing can restore seral aspen stands but would do little for drought-stressed stands at the limit of suitable habitat.

Cottonwood

Cottonwoods typically dominate riparian communities on fluvial surfaces along floodplains of streams and rivers. The ecological integrity of cottonwood forests on the Lolo National Forest is rated as low. Establishment of new cottonwood stands along rivers in western Montana require regular flooding events and along floodplains that are hydrologically connected to the river. Forest management can maintain existing stands by thinning out conifers and protecting stands from high ungulate herbivory. Restoration of floodplain connectivity would require cooperative work with other agencies and private landowners.

Landscape Pattern and Connectivity

The distribution of habitat elements and vegetation on the landscape is as a key ecosystem characteristic. Generally, a resilient landscape is made up of a mosaic of age classes, composition, and succession stages.

Openings in the forest, such as early seral forests created after a stand-replacing disturbance, are one important component. Early seral habitat is currently distributed in size and abundance within the natural range of variation. Large multi-storied patches are also a key ecosystem characteristic for many species. At the landscape scale, the amount and connectivity of multistory forest has increased dramatically and is dominated by medium sized or smaller, shade-tolerant trees. Many of these stands are at high risk of catastrophic loss to wildfire or other disturbances. Montane grasslands and associated edge habitat represent key habitat for many species. The general trend is a slight, gradual increase in the amount of grassland. However, native grasslands are subject to threats such as invasive plant species. With respect to overall habitat diversity, prior to 1985 the suppression of disturbances resulted in a gradual loss of landscape heterogeneity. After 1985, an increase in wildfire activity and density-related tree mortality has reversed this trend, resulting in a greater distribution of early seral patches. While we see a trend toward increased heterogeneity, the structural diversity on the Lolo National Forest is currently low.

Ecosystem connectivity, defined as the distribution of vegetation types, cover types, size classes, and densities, helps facilitate ecological connectivity and is meaningful for disturbance processes, genetic flow, and the integrity and functionality of wildlife habitat. Preliminary modeling efforts show that the area just west of St. Regis appears to provide some of the highest potential for connectivity across Interstate 90, which represents a potential barrier for species such as wolverine or grizzly bear. In addition, the Bitterroot Valley represents a significant barrier to closed-canopy species; however, the area just south of Lolo may provide crossing opportunities for species capable of longer distance dispersal by leveraging the riparian areas and existing conservation easements along the Bitterroot River. Finally,

Highway 83 represents a potential barrier in the Upper Blackfoot Clearwater geographic area. However, a section just south of Seeley Lake may provide crossing opportunities for closed canopy species.

Native Plant and Wildlife Diversity

The 2012 Planning Rule provides direction to maintain diversity of animal communities and the persistence of native species through emphasis on a coarse filter approach. All wildlife species are contributors to biological diversity and ecosystem integrity as components of “the diversity of plant and animal communities” and the revised plan will address “persistence of most native species in the planning area” (36 CFR 219.9). Most native wildlife species’ needs are evaluated in the context ecosystem integrity. The assessment focuses on the condition, status, and trends for “at-risk species”, which include federally recognized threatened, endangered, proposed, and candidate species, and potential species of conservation concern.

Species of Conservation Concern are native species known to occupy the Lolo National Forest that are not recognized under the Endangered Species Act, but for which the Regional Forester has determined there is substantial concern for the species’ long-term persistence within the plan area. The 1986 Forest Plan operates under a policy for sensitive species, which are “those plant and animal species identified by a Regional Forester for which population viability is of concern” (FSM 2670.22). The list of Potential Species of Conservation Concern is subject to modification during the planning process, and final authority for designation of Species of Conservation Concern rests with the Regional Forester.

At-risk Plants

Federally recognized threatened, endangered, proposed and candidate plant species. As of February 2023, two plant species listed as threatened by U. S. Fish and Wildlife Service may be present on the Lolo National Forest: whitebark pine (*Pinus albicaulis*) and Spalding’s catchfly (*Silene spaldingii*).

- Whitebark pine is a foundational species of high elevation forests up to timberline. It is known from all high elevation mountain ranges within the plan area. Populations have been declining mostly due to white pine blister rust, an invasive pathogen that affects western white pine, limber pine, whitebark pine and other closely related five-needle pines.
- Spalding’s catchfly occurs in low elevation grasslands, habitat types that are not very common on the Lolo National Forest. Spalding’s catchfly has not been recorded on the Lolo National Forest and little suitable habitat exists. Spalding’s catchfly was listed because of concerns regarding habitat fragmentation and habitat loss.

Potential plant species of conservation concern. Based on the potential species of conservation concern identification criteria, 81 plant species warranted an in-depth evaluation for identification, including 17 bryophytes, 7 lichens and 56 vascular plants. Based on the best available scientific information eight plant species were identified as potential species of conservation concern:

- Arctic Sweet Coltsfoot (*Petasites frigidus*)
- Hiker’s Gentian (*Gentianopsis simplex*)
- Hollyleaf Clover (*Trifolium gymnocarpon*)
- Howell’s Gumweed (*Grindelia howellii*)
- Idaho Barren Strawberry (*Waldsteinia idahoensis*)
- Oregon Bluebells (*Mertensia bella*)

- Sandweed (*Athysanus pusillus*)
- Scalepod (*Idaho scapigera*)

Terrestrial Wildlife Species

Federally recognized threatened, endangered, candidate and proposed terrestrial wildlife species that may be present on the Lolo National Forest include grizzly bear, Canada lynx, yellow-billed cuckoo, monarch butterfly, and wolverine. In particular, the Lolo National Forest—

- Provides key connectivity corridors between recovering the Northern Continental Divide Ecosystem and Cabinet-Yaak grizzly bear populations, as well as to the unoccupied Bitterroot Ecosystem;
- Contains the Ninemile Demographic Connectivity Area, designated in the Northern Continental Divide Ecosystem grizzly bear conservation strategy;
- Is situated on the edge of currently occupied Canada lynx habitat, but the majority of the Forest is not occupied by resident lynx; and
- Provides widespread wolverine habitat.

Potential Terrestrial Wildlife Species of Conservation Concern. Based on the potential species of conservation concern identification criteria, 32 terrestrial species were considered for designation as potential species of conservation concern. Based on the best available scientific information, three terrestrial species were identified as potential species of conservation concern:

- Bighorn sheep (*Ovis canadensis*)
- Fisher (*Pekania pennanti*)
- Harlequin duck (*Histrionicus histrionicus*)

Fish and Other Aquatic Wildlife

federally recognized threatened, endangered, proposed and candidate aquatic wildlife species and sensitive species. Plan-area native aquatic communities are highly dependent upon cold, clean water. Several species are listed as threatened under the Endangered Species Act (bull trout) or Regional Forester sensitive species from land/water use that has degraded habitat (westslope cutthroat trout and western pearlshell mussel). Recovery efforts are underway but complicated by non-native species and climate change. While many legacy actions no longer pose significant threats, the persistent nature of mainstem river dams and forest transportation networks and recreation facilities continue to affect species and their habitat. The presence of non-native species and climate change are perhaps now among the most severe threats to the continued existence of native, cold-water-dependent species.

Potential Aquatic Wildlife Species of Conservation Concern. Based on the potential species of conservation concern identification criteria, 28 aquatic species warranted an in-depth evaluation, including 3 amphibians, 21 aquatic insects, 2 aquatic mollusks, and 2 fish. Based on the best available scientific information, 2 aquatic species were identified as potential species of conservation concern:

- Idaho Giant Salamander (*Dicamptodon aterrimus*)
- Western Pearlshell (*Margaritifera falcata*)

Pollinators

Invertebrate pollinators are crucial components of functioning ecosystems. There is evidence that, broadly, many pollinator species are in decline due to a variety of factors, including habitat loss and fragmentation, nonnative species, pests and pathogens, and climate change. No pollinator species are currently identified as potential species of conservation concern for the Lolo National Forest. The Monarch butterfly was identified as a candidate for federal listing in December 2020.

Watersheds and hydrology

Watershed Condition Framework

Based on the Watershed Condition Framework analysis, of the 176 watersheds on the Lolo National Forest, 56 watersheds are functioning properly, 99 are functioning at risk, and 18 are impaired. For watersheds that were rated impaired, the most significant drivers of the ratings in the plan area were roads. Across the Plan area, watersheds were most rated as impaired for the indicators: aquatic biota, roads and trails, and aquatic habitat condition.

Water Quality

The Lolo National Forest provides high quality surface and groundwater to the multiple ecosystems and public needs that depend on clean water. Approximately 10 percent of the streams on the Lolo are listed as impaired by Montana Department of Environmental Quality for mining, grazing, silvicultural, and road-related sources, among other. The Forest has an active watershed restoration program, temperature monitoring program, and comprehensive resource protection measures on projects small and large. Monitoring results indicate that most streams are within reference conditions, but a few of the metrics show slightly less favorable conditions in developed watersheds. Most streams on the Lolo are in good shape; however, some streams or stream segments have issues affecting water quality and stream health.

Geology and Soils

Maintaining soil productivity is an important part of managing the forest. There is currently a transition to new ground-based systems to treat steep ground; soil monitoring of these systems may identify new protections and best management practices to conserve soils. Soil restoration activities are likely to increase, and the level of road decommissioning has increased over the planning period. We expect this trend to continue and result in soil productivity improvements. Restoration actions in timber harvest areas, particularly on burn piles, also restore soils. Increased wildfire will likely continue to impact soil productivity both positively and negatively depending on burn severity. Soils recover more slowly in dry areas where burned severely and erosion moves soil material. Low severity prescribed burning can ameliorate soils boosting nutrient cycling and leaving beneficial charcoal. It is important to align hazardous fuels reduction objectives with soil productivity and ecological integrity requirements.

Air Quality

The air quality in and around the Lolo National Forest is generally good. The Lolo has an active prescribed burning program; this program accomplishes burning in compliance with the Montana Department of Environmental Quality and Missoula City-County Health Department annual permits and within the approval guidelines set forth in the 2010 Montana-Idaho Airshed Group. Air quality can be compromised during winter months in communities where wood smoke causes health standard exceedances, and during fire season months when wildfires cause exceedances across the state.

Carbon Stocks and Carbon Pools

Carbon stocks on the Lolo National Forest have increased approximately 9 percent from 1990 to 2013. If the Lolo National Forest continues its current trajectory, more stands will reach a slower growth stage in coming years and decades, potentially causing the rate carbon accumulates to decline and the Forest may eventually transition to a steady state in the future. The interacting and uncertain effects of climate and disturbance will likely be the primary drivers of carbon dynamics in the future.

Assessment Findings: Socioeconomic Elements and Multiple Uses

Social and Economic Conditions

The planning rule requires the consideration of social, economic, and ecological factors in all phases of the planning process. The Responsible Official should identify and describe a primary area of influence to serve as the spatial scale to evaluate social, cultural, and economic conditions. The area of influence is where the management of the plan area substantially affects social, cultural, and economic conditions. The social and economic area of influence includes related Tribal Nation Reservations and associated counties. The draft area of social and economic influence for the Lolo National Forest spans 27 counties.

Population Structure and Dynamics

Human population structure (e.g., size, composition, density) and population dynamics (e.g., how the structure changes over time such as age distribution, in- and out-migration) are important components to understanding the relationship between forest management and the social environment. The proposed 27-county area of influence was first home to a many American Indian Tribes. These Tribes were forcibly removed from their homelands and segregated to reservations. Today, American Indians live throughout the proposed area of influence.

From 1970 to 2021 the population in the socioeconomic area of influence increased by almost 40 percent. All counties increased in population, although growth rates varied widely. Exceptions, where the population decreased, were in Powell and Mineral counties in Montana and in Clearwater County in Idaho. Most of this area is categorized as either nonmetro or rural areas rather than urban. Median ages for the Montana portion of the proposed area of influence ranged from 36 to about 56. Median ages for the Idaho portion ranged from approximately 30 to 53. About 20 percent of the population in the proposed area of influence were under the age of 18.

Most of the land in the proposed 27-county area of influence is publicly managed, with over half of the total acres under Forest Service management. Since 1970, employment has risen by 162 percent overall, though individual counties have experienced anywhere from a 29 percent decline to a nearly 700 percent increase during that time. The overall unemployment rate was 3.9 percent in the proposed area of influence in 2021. The area of influence is experiencing lower unemployment than the nation, but slightly higher than the statewide averages in Montana and Idaho. Personal income grew by about 288 percent between 1970 and 2021, compared to 256 percent growth in the United States. Every county in the proposed area of influence had positive real personal income growth during this period.

Contributions to Local Economics

There are approximately 523,000 jobs and \$23.6 billion in labor income in the area of influence. The five largest sectors, in terms of employment, in the regional economy are: (1) government, (2) health and social services, (3) retail trade, (4) accommodation and food services and (5) construction. The Lolo National Forest contributes to the income and employment. The extraction and consumption of forest products (for example, timber and forage), recreation visitors, and forest expenditures (for example, equipment and salaries) all contribute to economic activity. The number of jobs attributable to Forest Service program areas is approximately 1,857 jobs on an average annual basis. Timber, recreation visitor use, and agency operations (Forest Service expenditures) contribute the most to employment in the regional economy.

Jobs associated with timber pay more, on average, than jobs associated with recreation, while payments to states and counties support the highest average annual incomes. The Lolo National Forest supports jobs and labor income in several non-timber sectors, particularly accommodations and food services, multiple levels of government employment, manufacturing, agriculture, and retail trade. This contribution is small relative to the entire local economy in the area of influence.

Key Ecosystem Services and Benefits to People

Ecosystem services are benefits (forest goods and services, benefits to people) that people obtain from ecosystems. The Lolo National Forest supports an abundance of such benefits that contribute to human well-being including but not limited to clean water, clean air, jobs and income, traditional foods and medicines, recreation, climate change mitigation, and commercial forest products.

Environmental Justice

All federal actions consider environmental justice in the local region. Environmental justice has three components: fair treatment and meaningful involvement; avoid disproportionate harm and adverse outcomes to Indian tribes and Alaska natives, low-income and minority populations; and avoid denial and inequity in access to benefits of programs, policies, and activities. Recent studies point to the importance of internet access to communities' ability to understand their exposure to harms related to adverse outcomes, access, and distribution of benefits as well as their ability to be meaningfully involved in planning processes. Only about 13% of Idaho residents of counties in the proposed area of influence had 80-100% access to broadband. In Montana, estimates were slightly better at 25%. This understanding provides important context for the design of effective public outreach methods.

Community Resilience

In this planning context, community refers to a specific geographic location within the proposed area of influence. Community capacity is one way to better understand a given communities resilience. In Idaho, Kootenai, Latah, and Nez Perce Counties were calculated to have the highest rural capacity scores and Lewis County the lowest. In Montana, Missoula, Lewis and Clark, and Flathead counties had the highest capacity scores, and Mineral and Powell Counties had the lowest. The lowest community capacity scores for both Montana and Idaho were all similar.

Public Information, Interpretation, and Education

Connecting people to their environment and to the natural and cultural history of the area is an important role of the Lolo National Forest. Relevant and timely public information, creative interpretation, and education programs help the Forest Service communicate with the public and enable visitors to be involved in the activities, actions, and expectations on National Forest System lands. These connections provide opportunities for the development of strong stewardship ethics and appreciation for natural and cultural history. The Lolo provides a variety of ways to learn about the Forest and participate in environmental education through information available on websites, in-person and on-line opportunities, and on-site interpretative materials. Visiting Interpretive Areas has consistently been one of the top 5 special areas or facilities that forest visitors use. Continuing to maintain interpretive areas may include providing updated materials where sites have experienced vandalism or have deferred maintenance.

Fire Management and Wildland-Urban Interface

Fire is a natural and essential ecological disturbance process that occurs along a spectrum of differing intensity, severity, and frequency that allows ecosystems to function in a healthy and sustainable manner. Despite a legacy of fire suppression over the last century, fire continues to play a role on the Lolo

National Forest with on average over 200 fires of various causes started every year since 1992. In addition, from 1985 to 2020, approximately 640,923 acres have burned. Over 1.3 million acres of the Lolo is currently identified as wildland urban interface. New methods to assess fire hazard and risk have emerged and been brought to bear on fire management, resulting in the development of Strategic Fire Management Zones. Over 300,000 acres of hazardous fuel treatments have been accomplished on the Forest, much of it using prescribed fire and focused on wildland urban interface areas. The wildland urban interface is likely to continue to increase.

Cultural Resources and Tribal Areas of Importance

Sacred sites, sacred places, tribal cultural landscapes, and traditional cultural properties have religious, cultural, and traditional importance to indigenous individuals and Indian Tribes. Traditional cultural knowledge, Traditional Cultural Properties, 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. Approximately 1,008 archaeological, traditional cultural properties, and historic sites are recorded on the Lolo National Forest, including sites on the National Register of Historic Places. The condition of these features varies; taken as a whole, historic properties across the planning area exist in fair condition. The chance of discovering additional cultural resources is high in areas that have not been inventoried.

Sustainable Recreation

Recreation Opportunities and Recreation Opportunity Spectrum

The Lolo National Forest offers world-class recreation opportunities based on its combination of big backcountry, wilderness, and roaded access. Recreation use is growing, and the way people recreate is diversifying. Population growth, wealth, and demographic changes continue to outpace state averages. Front country areas are under tremendous pressure from both residents and visitors. Use on the Forest is year-round, but not uniform. Summer continues to be the largest visitor season, but participation in winter recreation is increasing. Residents of rural communities see the forest as an extension of their community, their livelihoods may be dependent on forest products, and traditional forest uses ingrained in their families. Recreation management issues have grown in complexity and scale since the completion of the 1986 Forest Plan. Travel planning will continue to be a contentious issue.

Maintenance and capital improvements needed for existing public use exceeds the fiscal capability of the Lolo. Funds provided through the Great American Outdoor Act is providing funding to improve roads and recreation facilities. Limits based on terrain, safety, resource availability, wildlife and other resource needs may not meet the demands of the public. Focusing on the Lolo National Forest's roles and niches and opportunities provided by other entities, partnerships, cooperators, and volunteers is essential. Existing recreation facilities and opportunities demonstrate that recreationists are drawn to water. Many of the highly popular, concentrated use areas may have been designed and developed more than 40 years ago for a different purpose, technology, or user group. These areas often can sustainably accommodate visitation growth after investment, redesign, or re-visioning.

Recreation Special Uses

Recreation special uses such as ski areas, outfitting and guiding services, and organizational camps connect people to the forest. Annually, tens of thousands of people ski down winter slopes, get packed into remote camps to hunt big game, or attend summer camps on National Forest System lands - all of which is made possible through the issuance of special use permits. Outfitter and guiding services, recreation residences, and recreation events represent the majority (90 percent) of recreation special uses

across the Lolo National Forest. Over half of recreation special use permits are for outfitter and guiding service. Specific to these authorizations, fishing, river recreation, hunting, and equestrian or stock use are the most frequently authorized uses and provide important opportunities to connect visitors to the forest and occur across all Ranger Districts across the Forest.

Scenery

Scenery is important to visitors' overall experience when visiting the Forest. Research has shown that people prefer natural settings when visiting public lands. National forests also serve as a backdrop to other activities visitors participate in while recreating. The second highest activity visitors participate in nationally is viewing natural features, with 43 percent of visitors participating in this activity. This high percentage emphasizes the importance of maintaining natural appearing landscapes so the expectations of these visitors can be met by the Forests. Currently, the scenic integrity of about 40 percent of the Lolo National Forest is classified as high or very high, and 51 percent is rated as moderate. Only 9 percent is rated with low scenic integrity.

Land Ownership, Status, Use and Access

The Lolo National Forest has an active land acquisition program that has resulted in hundreds of thousands of acres being added to the administrative land base over the last several decades. The pace and scale of this recent activity might not be sustained because many of the readily available tracts have been addressed. The legacy of vegetation management practices and the existing road network are important considerations in determining the appropriate management framework for these lands.

Authorized non-recreation special uses on the Lolo National Forest include industrial or commercial uses, private uses, and a variety of recreational uses. The trend in the number and array of special use permits has been relatively stable, but there is potential for a trend of increasing requests for permits.

Access to National Forest System lands is important from a variety of perspectives. In general, there has been a trend of decreasing motorized access. There has been an increase in access to some locations made available through land acquisitions, but also an increase in development and privatization of lands that makes access more difficult in other locations. There is increasing demand to address access issues as they relate to private land and easements, and a trend of private landowners becoming reluctant to grant full easements to the Forest Service.

Infrastructure

Maintaining infrastructure to meet the needs of the forest users is important to the local economies and quality of life for those living in surrounding communities. National Forest System roads provide access that supports resource management activities including timber harvest, vegetation management, fuel reduction, and fire suppression as well as access for recreational opportunities for the public.

Forestwide, there are approximately 3,165 miles of road open for public use either seasonally or year-round. Overall, there has been a trend of reducing the miles of road present on the landscape since 1986. Road maintenance with limited funding available is focused on roads open to public travel that access administrative sites and high use recreation sites. There are over 2,500 miles of trail, most which are terra trails. The trails program has demonstrated a commitment to maintaining and working towards trails management objectives. Of the 231 administrative facilities on the Forest, roughly 42 percent are listed or eligible for listing on the National Register of Historic Places. About 47 percent of facilities are in a poor condition and 12 percent are planned for decommissioning to improve alignment with administrative

needs and budget capacity. There are nearly 200 road bridges and 14 dams present; conditions of these features varies widely.

Designated areas

The assessment identifies two categories of designated area, statutorily designated (for example, national recreation areas, national scenic and historic trails, wild and scenic rivers, and wilderness areas), and administratively designated (for example, inventoried roadless areas, national recreational trails, and research natural areas).

Designated Wilderness

Four congressionally designated wilderness areas are within, or partially within the Lolo National Forest administrative boundary, making up approximately 7 percent of the Forest. Welcome Creek and Rattlesnake Wilderness areas are wholly within the administrative boundary. The Scapegoat Wilderness is part of the Bob Marshall Wilderness Complex and is only partially on the Lolo National Forest. A portion of the Selway-Bitterroot Wilderness also falls within the Lolo National Forest. Designated wilderness provides primitive and semi-primitive non-motorized recreation settings that support forest visitors seeking solitude, closeness with natural landscapes, challenge, and self-reliance. Overall satisfaction is generally high for visitors recreating within designated wilderness. While the average rating of crowding was generally consistent between 2006, 2011, and 2016 surveys, the percent of visits with higher crowding ratings increased and lower crowding ratings decreased.

Recommended Wilderness

Recommended wilderness areas are federal lands that have been inventoried, evaluated, and analyzed for inclusion in the National Wilderness Preservation system, but have not received designation through congress-supported legislation signed by the President. The 1986 Lolo Forest Plan recommended 223,915 acres for wilderness designation across the forest, including the Great Burn, Bob Marshall Additions, Selway-Bitterroot Addition, and Sliderock. Management Area 12 from the 1986 Plan included the goal that these areas would be managed to protect their wilderness characteristics pending a decision as to their classification. Public motorized uses, as well as mechanical uses, are not currently allowed in these areas. As part of the wilderness recommendation process associated with this plan revision effort, all previously recommended wilderness areas will be included in the inventory of lands that may be suitable for inclusion in the National Wilderness Preservation System and evaluated for wilderness characteristics.

Eligible Wild and Scenic Rivers

There are currently no rivers designated as wild and scenic on the Lolo National Forest. In 1991, nine rivers and streams were identified as eligible. In 1996 a suitability study was completed on eight of those rivers. All eight, along with additional major tributaries, were determined to be suitable for designation. Protections and management direction included in Amendment 12 of the 1986 Forest Plan have been applied to protect the outstandingly remarkable values for which they were found eligible. As required by the 2012 Planning Rule, a wild and scenic rivers eligibility study will be conducted as part of the plan revision process. There are four phases to this process: inventory, evaluation, analysis, and recommendation. While the results are preliminary, the initial inventory resulted in 682 named rivers and streams in the planning area to evaluate for eligibility.

Inventoried Roadless Areas

The intent of the 2001 Roadless Area Conservation Rule is to provide lasting protection for inventoried roadless areas within the National Forest System in the context of multiple-use management. Prohibitions

and restrictions established under this rule are not subject to reconsideration, revision, or rescission under plan revisions (36 CFR 294.14(e)). The unique contribution of inventoried roadless areas is important in maintaining habitats, natural processes, and remote recreation opportunities in the regional and national network of protected lands. There are over 700,000 acres of inventoried roadless areas on the Lolo National Forest, approximately 34 percent of the land administered by the Forest.

Research Natural Areas

Research natural areas are permanently established to maintain areas of natural ecosystems and areas of special ecological significance. The Lolo National Forest includes nine established research natural areas with a total size of approximately 4,180 acres. In 2017, Carlton Ridge and Pyramid Peak burned in the Lolo and Rice Ridge fires, respectively. High priority target recommendations for potential new research natural areas include ponderosa pine, western redcedar forest types, and rough fescue grasslands.

Special Areas

Special areas are certain limited areas of National Forest System lands not designated as wilderness and containing outstanding examples of plant and animal communities, geological features, scenic grandeur, or other special attributes that merit special management. The 1986 Lolo Forest Plan included the botanica areas Mary's Frog Pond and Shoofly Meadows. The latter is now a part of an established research natural area. The establishment of a third botanical area, Elk Meadow, was approved in 1986.

Travel Ways: Nationally Designated Trails and Scenic Byways

There are two national historic trails, the Nez Perce (Nee-Me-Poo) and the Lewis and Clark National Historic Trails, and ten national recreation trails that have been designated on the Lolo National Forest. Nationally designated trails help provide focus and commitments of resources in the context of a sustainable trails program. The Lolo Trail National Historic Landmark is partially on the Lolo National Forest. The Lolo Trail is an ancient route that follows the ridgetops parallel and to the north of Highway 12. This trail provided access to buffalo on the eastern plains for those on the Columbia Plateau and led people living east of the mountains to salmon-rich waters in the west. The Nez Perce (Nee-Me-Poo) and Lewis and Clark National Historic Trails lie within the Lolo Trail National Historic Landmark. Montana state highway 135 is also located on the Lolo and is designated as the St. Regis-Paradise Scenic Byway.

Rattlesnake National Recreation Area

Designated under the Rattlesnake National Recreation Area and Wilderness Act of 1980, the Rattlesnake National Recreation Area covers over 60,000 acres of the Lolo National Forest. The Rattlesnake Wilderness area is within the National Recreation Area boundary. Consistently popular for hiking, running, and biking, the Rattlesnake National Recreation area is a unique recreation asset in the backyard of Missoula. Use levels and interest continue to increase.

Production of Natural Resources

Timber Suitability, Production, and Harvest

Timber harvest from the Lolo National Forest has been an important source of jobs, income, and economic development for over 150 years. Timber harvested is used for a wide variety of wood products. The 1986 Forest Plan identified an allowable sale quantity of 107-131 million board feet annually. From 1986 to 2021, an average of 35 million board feet of timber products were sold per year. There have been recent trends in accelerated volume sold primarily related to post-fire salvage harvest. The 1986 Forest Plan identified approximately 50% of the Lolo National Forest as suitable for timber production;

however, a portion of this area (approximately 20%) is now designated as inventoried roadless areas. In addition to timber production, timber harvest is used as a tool to achieve multiple resource objectives including fuels reduction, enhancing wildlife habitat, and ecological restoration. Timber harvest activities are designed to support the economic structure of local communities, provide timber to meet regional and national lumber demands, and promote ecological integrity of forested ecosystems.

Non-timber Forest Products

Fuelwood is the main non-timber product produced in the Lolo National Forest and its demand is expected to rise. The removal of forest biomass for heating or power generation is an emerging use. Other products offered for personal use or commercial permits include Christmas trees, mushrooms, boughs, transplants, and posts and poles.

Livestock Grazing and Range Management

Livestock grazing on National Forest System lands contributes to the social and economic sustainability of rural communities. On the Lolo National Forest, grazing use has been declining since the 1950's. There are currently 11 active cattle grazing allotments, covering just over 200,000 acres total. Capable and suitable rangelands are limited. Allotment management plans are routinely revised to ensure that livestock grazing management decisions are based on existing and future ecological, social, cultural, and economic conditions. While improper livestock grazing can have numerous undesirable resource impacts, current management seeks to maintain livestock grazing opportunities at current levels on active grazing allotments and special use pastures while maintaining healthy rangeland conditions. Current livestock use is being managed with the carrying capacity of the existing allotments and the Forest has been successful with managing and updating the existing permits to achieve 1986 Forest Plan direction.

Energy, Minerals, and Renewable Energy

The Lolo National Forest has a long history of mining and mineral development. Current and forecasted interest in mineral development across the forest is relatively limited. The current regulatory framework in tandem with 1986 forest plan direction has provided an effective framework for managing mining requests and mitigating or avoiding legacy effects. It is estimated that there are over 246,000 acres on the Lolo National Forest with separated mineral rights held by private or non-Federal government entities.

Hunting, Fishing, and Wildlife Viewing

Hunting, wildlife viewing, fishing, and trapping are important in many ways: as traditional activities going back generations, as an important cultural activity for the tribes, as a means of subsistence, as income through sale of pelts or through outfitting and guiding, and as a connection to nature, to name a few. The Lolo National Forest provides extensive and readily accessible opportunities for both consumptive and non-consumptive use of wildlife resources. Key species related to these uses include a variety of big game species, black bears, furbearers, gray wolves, mountain lions, game birds, and trout. Fishing, hunting, and other wildlife-related recreation represent significant economic return for communities in and around the Lolo National Forest, exceeding \$10 to \$20 million dollars annually.

Municipal Watersheds

National forests are the largest source of municipal water supply in the Nation. The Forest Service manages public water supplies in cooperation with the states to maintain water quality and natural-based quantities. The Lolo National Forest has many watersheds that provide public water supply ranging from relatively large municipalities to small domestic use. The Forest manages 8 municipal watersheds and 59 source water protection areas. Source water protection areas are delineated for ground water and surface

water sources and considers characteristics of the aquifer or watershed as elements that affect various public water system intake.