NATIONAL CONSERVATION LANDS

Analysis of The Management Situation

Resource Management Plan for Cascade-Siskiyou National Monument

June 2023

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ACRONYMS AND ABBREVIATIONS

	Full Phrase
ACEC	area of critical environmental concern
ACS	Aquatic Conservation Strategy
AIM	Assessment, Inventory, and Monitoring
AML	abandoned mine lands
AMS	analysis of the management situation
AUM	animal unit month
BAR	burned area rehabilitation
BLM	Bureau of Land Management
C	carbon
°C	degrees Celsius
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CFS	cubic feet per second
CO_2e	carbon dioxide equivalent
CSNM	Cascade-Siskiyou National Monument
DEQ	Department of Environmental Quality
DOI	Department of the Interior
DM	Departmental manual
EA	environmental assessment
EIS	environmental impact statement
EJ	environmental justice
EPA	US Environmental Protection Agency
ERMA	extensive recreation management area
ESA	Endangered Species Act of 1973
°F	degrees Fahrenheit
FEIS	final environmental impact statement
FLPMA	Federal Land Policy and Management Act of 1976
FMP	fire management plan
FR	Federal Register
FT3	cubic feet
GeoBOB	Geographic Biotic Observations app
GHG	greenhouse gas
GIS	Geographic Information System
GNN	Gradient Nearest Neighbor
HMA	herd management area

HUC	hydrologic unit code
HVRA	Highly Valued Resource or Asset
IM	instruction memorandum
IPCC	Intergovernmental Panel on Climate Change
LB	pound
LiDAR	Light Detection and Ranging
LWC	lands with wilderness characteristics
LWCF	Land and Water Conservation Funds
M	meter
MG	milligrams
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NLCS	National Landscape Conservation System
NOAA	National Oceanic and Atmospheric Administration
NOI	notice of intent
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRV	natural range of variability
NSHT	National Scenic Historic Trails
NWCG	National Wildfire Coordination Group
NWFP	Northwest Forest Plan
ODEQ	Oregon Department of Environmental Quality
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
OHV	off-highway vehicle
OPLMA	Omnibus Public Land Management Act
OR/WA	Oregon/Washington
ORV	outstandingly remarkable value
PAG	Plant Association Groups
PCNST	Pacific Crest National Scenic Trail
PIM	permanent instruction memorandum
PL	public law
PRMP	proposed resource management plan
RD	relative density
RHA	rangeland health assessment
RMA	recreation management area
RMP	resource management plan
RMIS	recreation management information system

RMZ	recreation management zone
RNA	research natural area
ROD	record of decision
ROW	right-of-way
SDI	stand density index
SHPO	State Historic Preservation Office
SMW	Soda Mountain Wilderness
SRMA	special recreation management area
SRP	special recreation permit
SWO	Southwestern Oregon (RMP)
Tg	teragram
TID	Talent Irrigation District
TMA	travel management area
TMP	travel management plan
US	United States
U.S.C.	United States Code
USDA	United States Department of Agriculture
USDA FS	United States Department of Agriculture Forest Service
USDI BLM	United States Department of the Interior Bureau of Land Management
USDI FWS	United States Department of the Interior Fish and Wildlife Service
USGS	United States Geological Survey
VRI	visual resources inventory
VRM	visual resource management
WSA	wilderness study area
WSR	wild and scenic river
WSRA	Wild and Scenic Rivers Act
WUI	wildland urban interface

Chapter 1. Introduction

The Medford, Lakeview, and Northern California Districts of the Bureau of Land Management (BLM) have begun the process of revising the current resource management plan (RMP) for the Cascade-Siskiyou National Monument (CSNM) (USDI BLM 2008). In April 2022, the BLM conducted an evaluation of the 2008 CSNM RMP in accordance with its planning regulations (43 CFR 1610.4-9) which focused on the consideration of new information associated with several non-discretionary[1] designations. These designations were established between 2012 and 2019 within and adjacent to the CSNM RMP decision area, most notably the 2017 Monument expansion, which nearly doubled its original size and incorporated additional lands managed by the BLM in California and in Oregon's Medford and Lakeview Districts. Refer to **Map 1-1.** Cascade-Siskiyou National Monument - Plan and Administrative Boundaries. The BLM evaluated the changed circumstances the non-discretionary designations presented and concluded that the CSNM RMP needs to be revised to encompass all lands in the Monument under one plan to provide cohesive, long-range management objectives and direction. See the 2022 CSNM RMP Evaluation Report for more details on the scope and methods the BLM used to conduct this evaluation.

In October 2022, the BLM Director concurred with BLM Oregon/Washington (OR/WA that the 2008 CSNM RMP needs to be revised to encompass all lands in the CSNM under one plan and directed the BLM OR/WA to begin preparing an RMP for the CSNM with a goal of finalizing that plan by October 1, 2024 (see October 31, 2022 Memorandum).

The BLM is now preparing this analysis of the management situation (AMS) in response to updates to CSNM in the planning area boundary and in preparation for developing the new resource management plan for the CSNM.

1.1 What is an Analysis of the Management Situation?

Prior to preparing an RMP, the BLM must analyze the available inventory data and other information to characterize the resource area profile, portray the existing management situation, and identify management opportunities to respond to identified issues. In preparing this AMS, the BLM has analyzed available data and information to determine the degree to which an area can respond to the RMP's identified purpose and need relevant to the issues identified in the planning criteria.

This AMS provides a brief description of the resource conditions within the planning area and how these resources are currently being managed. It will serve as a baseline for the development of the alternatives in the environmental impact statement (EIS) associated with the RMP. This document represents an early component of the planning process and is not a comprehensive, detail-oriented document for various resources. It is intended to provide a summary of existing

[1] Non-discretionary designations are those that can only be established by the President, Congress, or the Secretary of the Interior pursuant to specific legal authority.

management practices, including direction from existing plans and agency policy, local resources, and social and economic conditions.

1.2 DEVELOPMENT OF PLANNING CRITERIA

Planning criteria lay the groundwork that guides the effects analysis and helps ensure the RMP is developed consistent with all applicable law, regulation, and policy. The criteria ensure:

- The planning effort is tailored to the issues previously identified; and
- The BLM avoids unnecessary data collection and analyses (43 CFR 1610.4-2(a)).

The preliminary issues and analytical frameworks are presented in Chapter 5. The BLM land use planning regulations state that the "estimation of effects shall be guided by the planning criteria and procedures implementing the National Environmental Policy Act" (NEPA; 43 CFR 1610.4-6). As such, the preliminary planning criteria presented in this document establish an early framework the BLM plans to use to analyze issues in the NEPA document.

Planning criteria must be made available for public review and comment prior to use (43 CFR 1610.1-2(c)). Some elements of the planning criteria will likely be refined or changed during the planning process as other steps in the process are completed or if new information becomes available.

1.3 PLANNING PROCESS AND SCHEDULE

The BLM planning process, explained in 43 CFR 1600, BLM Manual 1601, and BLM Land Use Planning Handbook (H-1601-1), falls within the framework of the NEPA environmental analysis and decision-making process described in the Council on Environmental Quality (CEQ) regulations of 40 CFR 1500–1508, the Department of the Interior (DOI) NEPA Manual (516 DM 1-7), and the BLM NEPA Handbook H-1790-1. **Table 1-1** shows an initial schedule of milestones, a part of the BLM's NEPA planning process, starting with the publication of the notice of intent (NOI).

Table 1-1. Milestone schedule

Milestone	Tentative Date
Publication of the NOI	Early Summer 2023
Publication of the AMS	Early Summer 2023
Public scoping and alternatives development	Summer 2023
Development of draft RMP/EIS	Fall 2023
Publication of draft RMP/EIS and public comment period	Winter 2023-2024
Proposed RMP/Final EIS	Summer 2024
Protest resolution period	Fall 2024
Approved RMP and record of decision (ROD)	October 2024

Figure 1-1 shows the steps required during the BLM resource management planning process.

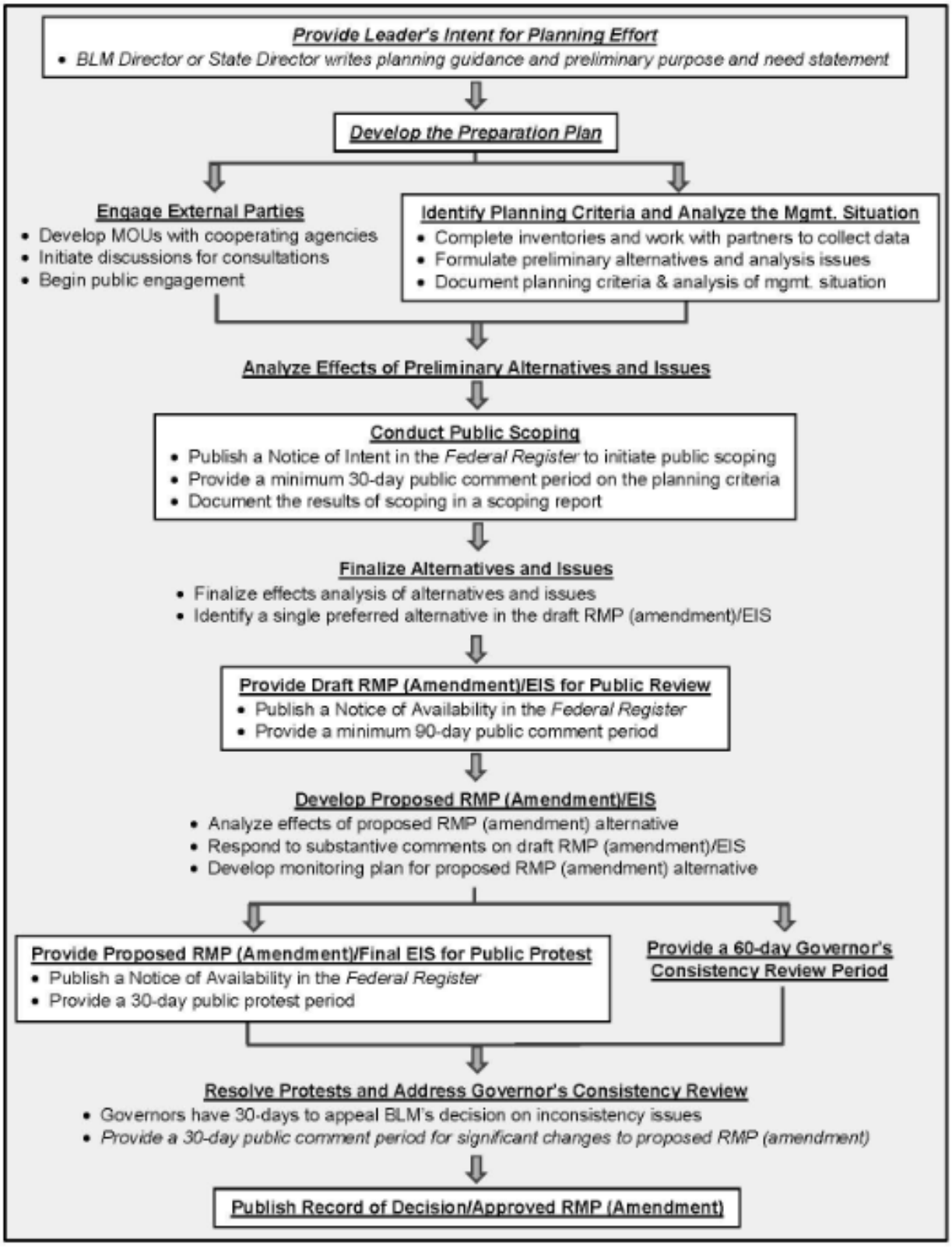

Figure 1-1. BLM planning steps for new plans, revisions, and amendments

Chapter 2. Planning Area and Existing Management

2.1 HISTORY OF THE CSNM

On June 13, 2000, President Clinton signed Presidential Proclamation 7318 (65 FR 37249) designating the Cascade-Siskiyou National Monument (CSNM) in southwest Oregon near the communities of Medford and Ashland (see Appendix A, CSNM Presidential Proclamations). The Proclamation identified the ecological wonders and unique biological diversity of the area as the primary reason for the proclamation and included numerous objects of scientific and historic interest within the CSNM boundary that warranted protection, including, but not limited to, a landscape of ecological wonder with unmatched biological diversity that provides habitat connectivity, watershed protection, and landscape-scale resilience for the area's critically important natural resources (see Appendix B, CSNM Objects of Scientific and Historic Interest).

At the time of designation, the CSNM included 52,947 acres of federal land administered by the BLM, Medford District. Additionally, there were approximately 32,000 acres of privately owned land within the Monument boundary. Private lands within the Monument boundary are not part of the Monument (see Section 2.2, Planning and Decision Area).

In the fall of 2000, the BLM began the planning process to develop an RMP for the CSNM. In August 2008, the BLM approved the Cascade-Siskiyou National Monument Record of Decision and Resource Management Plan (CSNM ROD/RMP) (USDI BLM 2008).

In March 2009, Congress designated the now 24,707-acre Soda Mountain Wilderness (SMW) within the boundary of the CSNM (Public Law 111-11, Section 1405). The BLM prepared the Soda Mountain Wilderness Stewardship Plan and Environmental Assessment (DOI-BLM-ORWA-M040-2011-0001-EA) in September 2011. The Final SMW Stewardship Plan was completed in April 2012. The CSNM ROD/RMP does not recognize this non-discretionary designation.

In January 2017, President Obama signed Presidential Proclamation 9564 (82 FR 6145, January 18, 2017) nearly doubling the size of the CSNM. The current boundary now includes approximately 113,506 acres of BLM-administered lands in the Medford and Lakeview Districts in Oregon, and the Northern California District in California (See Appendix A, CSNM Presidential Proclamations and **Map 2-1.** Cascade-Siskiyou National Monument - Boundary Changes and Other Designations.)

The expanded Monument now includes Horseshoe Ranch, most of the Jenny Creek watershed, the Grizzly Peak area, Lost Lake, the Rogue Valley foothills, the Southern Cascades area, and the area surrounding Surveyor Mountain—a Cascade-Siskiyou landscape providing vital habitat connectivity, watershed protection, and landscape-scale resilience for the area's critically important natural resources. The expansion bolsters resource protection within the original Monument boundaries and protects the important biological and historic resources within the expansion area.

In response to Proclamation 9564, multiple plaintiffs sued the President and BLM, claiming that the Monument expansion violated the 1937 Oregon and California Railroad and Coos Bay Wagon Road Grant Lands Act of 1937 (O&C Act). In 2017, two plaintiffs filed separate suits in the U.S. District Court for the District of Columbia. A third plaintiff filed suit in the District of Oregon. In September 2019, the District of Oregon upheld the Monument expansion, and the U.S. Court of Appeals for the Ninth Circuit affirmed the District Court in April 2023. In November 2019, the District Court for the District of Columbia found the Monument expansion violated the O&C Act by "reserving land governed by the O&C Act from sustained yield timber production" and held Proclamation 9564 "invalid and unenforceable as applied to land subject to the O&C Act." The government appealed this decision to the U.S. Court of Appeals for the District of Columbia. While the outcome of this appeal is uncertain, the BLM is exercising its discretion to initiate planning steps with the understanding that BLM retains the ability to modify or terminate any planning effort in response to the outcome of the litigation. (The eventual size of the decision area will need to be consistent with the litigation outcome.)

In March 2019, Congress designated the Jenny Creek and Spring Creek Wild and Scenic Rivers, primarily in the CSNM (Public Law 116-9). These designated rivers are classified as scenic and are now managed as part of the National Wild and Scenic Rivers System. The BLM has not started the process to develop a comprehensive river management plan for these rivers. In the interim, the BLM follows the requirements of the Wild and Scenic Rivers Act and BLM policy and direction for interim management. Refer to the 2022 CSNM Plan Evaluation Report for more information and maps.

2.2 Planning Area and Decision Area

The CSNM boundaries, as identified by Presidential Proclamation 9564, constitute the planning area for this RMP process (Refer to **Map 2-2.** Cascade-Siskiyou National Monument – Planning Area and **Map 1-1**. Cascade-Siskiyou National Monument - Plan and Administrative Boundaries).

The RMP's decision area will include, at a maximum, only the 113,506 acres of BLM-administered lands within the planning area. This is the specific area for which the BLM has authority to make land use and management decisions (**Table 2-1**). The RMP's scope of the decision area will depend on the outcome of the litigation previously mentioned in Section 2.1 and could, depending on court direction, include or exclude the O&C lands encompassed by Proclamation 9564 (**Table 2-2**).

Lands within the planning area reflect a checkerboard pattern of ownership; this is more the case in the Monument expansion area than in the original boundary because the BLM has acquired, primarily through Land and Water Conservation Funds, an additional 13,000 acres that were once private lands within the original boundary. An exception to the checkerboard pattern of ownership is the Soda Mountain Wilderness, located in the southern portion of the planning area. All lands within the Soda Mountain Wilderness are managed by the BLM.

The Bureau of Reclamation administers approximately 80 acres, around Hyatt Reservoir and Howard Prairie Reservoir within the planning area. The land administered by the Bureau of Reclamation is used primarily for canal purposes to transport water from Howard Prairie

Reservoir to Keene Creek Reservoir and the area around Hyatt Reservoir includes the Wildcat Campground, a primitive campground managed by the BLM.

The planning area is in the states of Oregon and California and includes lands within Jackson and Klamath Counties in Oregon, and Siskiyou County in California.

Table 2-1. Land ownership in the planning area

Land ownership	Acres
BLM	113,506
Other Federal	80
State	4,915
Private	51,906
Planning area total	170,407

Based on BLM Geographic Information System (GIS) 2022

Table 2-2. Land status of BLM-administered lands in the planning area

Land Status	Acres
O&C	80,007[2]
Public Domain	20,368
Acquired	13,131
Total	113,506

Based on BLM Geographic Information System (GIS) 2023

2.3 EXISTING MANAGEMENT

The BLM-administered lands in the planning area are divided between and currently managed under three different RMPs (**Table 2-3**).

Table 2-3. Current resource management plans

Resource Management Plan	Decision Area Acres (BLM-administered lands)
Cascade-Siskiyou National Monument RMP (2008)	65,846
Southwestern Oregon RMP (2016)	42,320
Redding RMP (1993)	5,340
Total	**113,506**

[2] There are 40,155 acres of O&C lands in the original boundary of the CSNM that are not subject to the pending litigation discussed in Section 2.1.

2.3.1 Current Management Direction

Cascade-Siskiyou National Monument RMP

The approximately 65,846 acres of BLM-administered lands in the planning area within the original boundary of the CSNM (Proclamation 7318, June 9, 2000) are currently managed under the Cascade-Siskiyou National Monument Resource Management Plan (USDI BLM 2008). Management decisions made in this RMP included:

- Land tenure zoning classifications;
- Designations of vegetation management areas, including:
    - Diversity Emphasis Area
    - Old-growth Emphasis Area
- Visual resource management classifications;
- Programmatic and site-specific decisions related to livestock grazing;
- Decisions regarding transportation and access (except those mandated by Proclamation 7318);
- Wildland fire management;
- Recreation management; and
- Management of linear rights-of-way and communication sites.

Specific management decisions and objectives for lands in the original CSNM RMP decision area are presented in Chapter 2 of the RMP (USDI BLM 2008).

In 2013, the BLM amended the CSNM RMP and revoked the land tenure adjustment decision LAND-1 on page 103 of the CSNM RMP and revised LAND-5 on page 103 to state:

> LAND-5: Lands may be acquired by exchange where the public land involved in the exchange is located outside the CSNM or where the public land involved is located within the boundaries of the CSNM, as long as in either case the exchange "furthers the protective purposes of the monument."

Southwestern Oregon RMP

The approximately 42,320 acres of BLM-administered lands in Oregon that became part of the CSNM through Presidential Proclamation 9564 (January 12, 2017) are currently managed under the Southwestern Oregon (SWO) RMP (USDI BLM 2016c). Approximately 39,852 acres (94 percent) of those lands are O&C lands. The remainder of lands are Public Domain lands and are manage under the SWO RMP to the extent possible consistent with Proclamation 9564 (see Chapter 3, Regulatory Framework).

The SWO RMP included the following decisions:

- Objectives for the management of BLM-administered lands and resources.

- Land use allocations relative to future uses for the purposes of achieving the various objectives, including[3]:
    - Congressionally Reserved Lands and National Conservation Lands
    - District-Designated Reserves
    - Eastside Management Area
    - Harvest Land Base
    - Late-Successional Reserve
    - Riparian Reserve
- Management direction that identifies where future actions may or may not be allowed and what restrictions or requirements may be placed on those future actions to achieve the objectives set for the BLM-administered lands and resources.

In addition, the SWO RMP includes appendices addressing RMP implementation, a monitoring plan, Best Management Practices, land tenure information and land withdrawals, stipulations on leasable fluid mineral exploration and development activity, designated Areas of Critical Environmental Concern, designated Recreation Management Areas, public motorized access guidelines, and available livestock grazing allotments.

Redding RMP

The approximately 5,340 acres of BLM-administered lands (Public Domain lands) in the planning area in Siskiyou County, California, are currently managed under the 1993 Redding RMP (USDI BLM 1993). The Redding RMP addressed management concerns regarding land tenure adjustments, recreation management, access, and forest management. Relevant decisions for the lands in the planning area included:

- Determination that lands in the planning area are part of the Klamath Management Area (USDI BLM 1993, p. 31).
- Management objectives for Horseshoe Ranch, an area managed in cooperation with the California Department of Fish and Wildlife and the BLM Oregon/Washington, Medford District, Ashland Field Office (USDI BLM 1993, pp. 33, 34).
- Management objectives for Jenny Creek, designated as a Research Natural Area/Area of Critical Environmental Concern (USDI BLM 1993, pp. 34, 35).

Interim Management and Guidance Memo

On October 31, 2022, the BLM Director issued a memorandum to the BLM Oregon/Washington and BLM California State Directors issuing interim management guidance for the lands within the planning area. The memo describes and acknowledges the existing litigation regarding the expansion of Cascade-Siskiyou National Monument on O&C Act lands (see also Section 2.1). While the outcome of these appeals is uncertain, the BLM is exercising its discretion to initiate

[3] Sub-allocations were also designated but are not identified here. Please refer to page 43 of the SWO RMP for a list of sub-allocations.

preliminary planning steps with the understanding that the BLM retains the ability to modify or terminate any planning effort in response to the outcome of the appeals.

The interim management guidance applies to all lands subject to Proclamation 7318 and to public domain lands subject to Proclamation 9564. For the O&C lands encompassed by Proclamation 9564, the memo clarifies that the BLM should continue to implement direction in the approved 2016 SWO RMP and, where permissible through the discretion afforded by the RMP and consistent with applicable law and meeting allowable sale quantity targets, should protect sensitive resources (which may be identified as monument objects in the Proclamations) while the legal appeals are resolved.

The memo addresses the several new non-discretionary designations that have been established on BLM-administered lands in the planning area since the 2008 CSNM RMP was completed and directs that while the BLM is in the initial process of preparing a revised RMP, the BLM will ensure that management of the Monument conserves, protects, and restores the objects of historic and scientific interest within the Monument boundary [i.e., planning area] for the benefit of current and future generations, consistent with the proclamation, the Omnibus Public Land Management Act of 2009 (16 U.S.C. 7202), and the John D. Dingell, Jr. Conservation, Management, and Recreation Act of 2019 (the Dingell Act, Public Law 116-9, 16 U.S.C. 28). Additionally, the BLM's policies for interim management of lands reserved as part of a national monument are generally outlined in Section 1.6 of BLM Manual 6220 National Monuments, National Conservation Areas, and Similar Designations (MS-6220).

The memo also provides direction for any discretionary project or activity proposed within the boundaries of the Monument or with the potential to affect objects for which the Monument has been designated, the BLM must undertake a two-part evaluation that considers whether the activity conforms to the applicable RMP as well as compliance with the Proclamations.

The memo also provides more specific guidance regarding particular types of uses and activities. Please refer to the Memorandum for more information.

Chapter 3. Regulatory Framework

The foundations of public land management are in the mandates and authorities provided in laws and regulations. For example, the O&C Act and Omnibus Public Land Management Act provide specific management requirements on certain parcels. The Federal Land Policy and Management Act and National Environmental Policy Act provide a framework that guides the planning and environmental analysis processes. Other federal laws and regulations, executive orders, manuals, and handbooks further guide the BLM in planning for and management of its public lands and resources. When developing and revising an RMP, the BLM must also coordinate with approved land use plans and policies of other federal agencies, states and local governments, and Tribes, to the extent consistent with the laws governing the administration of public lands.

3.1 The Oregon and California Railroad and Coos Bay Wagon Road Grant Lands Act

The Oregon and California Railroad and Coos Bay Wagon Road Grant Lands Act (O&C Act; 43 U.S.C. 1181a et seq.), enacted on August 28, 1937, by Congress, provides the legal authority for the management of O&C lands and Coos Bay Wagon Road lands. Approximately 70 percent of BLM-administered lands in the planning area are O&C lands (**Table 2-2**). There are no Coos Bay Wagon Road lands in the planning area. The provision of the Act that provides management direction for the O&C lands states, in part, that these lands:

> *"shall be managed except as provided in section 3 hereof, for permanent forest production, and the timber thereon shall be sold, cut, and removed in conformity with the [principle] of sustained yield for the purpose of providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, and providing recreational facilities ..." (43 U.S.C. 1181a).*

Sustained-yield timber production is the primary or dominant use of the O&C lands in western Oregon based on the language of the O&C Act, its legislative history, and case law. In managing the O&C lands for that primary or dominant use, the BLM must exercise its discretion to determine how to manage the forest to provide for sustained-yield timber production. Its discretion includes harvest methods, rotation length, and silvicultural regimes under which these forests would be managed. By managing in accordance with sustained yield, the BLM necessarily achieves the Act's purposes of "providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, and providing recreational facilities." Finally, when implementing the O&C Act, the BLM must also comply with subsequent laws that direct how the BLM accomplishes the statutory direction, such as the Endangered Species Act, the Clean Water Act, and the Omnibus Public Lands Management Act (see the following sections for a more comprehensive list of applicable federal laws).

3.2 OPLMA OF 2009 AND PRESIDENTIAL PROCLAMATIONS 7318 AND 9564

The Omnibus Public Land Management Act of 2009 (OPLMA; 16 U.S.C. 7201 et seq.) established the BLM's National Landscape Conservation System (NLCS or National Conservation Lands), including national monuments like the CSNM, "to conserve, protect, and restore nationally significant landscapes that have outstanding cultural, ecological, and scientific values for the benefit of current and future generations" (16 U.S.C. 7202(a)). The Act requires that the lands within NLCS units shall be managed "in a manner that protects the values for which the components of the system were designated" (16 U.S.C. 7202(c)(2)).

Presidential Proclamations 7318 and 9564, in accordance with the Antiquities Act of 1906, dedicated the lands within the CSNM to specific uses by designating and enlarging the national Monument and reserving the entirety of the lands within the boundary of the Monument as the smallest area compatible with the protection of the CSNM's objects of scientific and historic interest (see Section 2.1, History of the CSNM). Per OPLMA, the BLM shall manage the CSNM in a manner consistent with the protection of the objects and values for which the lands were designated. Multiple uses may be allowed to the extent that they are consistent with the designating legislation or proclamation, other applicable laws, and all relevant policies.

Presidential Proclamations 7318 and 9564 did not withdraw O&C lands within the Monument from management under the O&C Act. The O&C Act continues to apply to these lands and the BLM must manage them in accordance with the principle of sustained yield, which includes reserving some lands in the CSNM from harvest and the sustained yield calculation as described in the Act (43 U.S.C. 1181a).

3.3 FEDERAL LAND POLICY AND MANAGEMENT ACT

The Federal Land Policy and Management Act (FLPMA; Public Law 94-579; 43 U.S.C. 1701) provides the legal authority for the management of public domain lands and acquired lands administered by the BLM. Approximately 18 percent of the BLM-administered lands in the planning area are public domain lands, and less 12 percent are acquired lands (**Table 2-2)**. Section 302 of FLPMA provides that the BLM "shall manage the public lands under principles of multiple use and sustained yield … except that where a tract of such public land has been dedicated to specific uses according to any other provisions of law it shall be managed in accordance with such law" (43 U.S.C. 1732(a)). Therefore, where direction from the OPLMA or the presidential proclamations may conflict with FLPMA's multiple use mandate, then the multiple use mandate would not apply.

Regarding the O&C Act, FLPMA, Section 701(b) states: "Notwithstanding any provision of this Act, in the event of conflict with or inconsistency between this Act and the [O&C] Acts of August 28, 1937 (50 Stat. 874; 43 U.S.C. 1181a-1181j), and May 24, 1939 (53 Stat. 753), insofar as they relate to management of timber resources, and disposition of revenues from lands and resources, the latter Acts shall prevail."

Land use planning decisions for national monuments must be consistent with the purposes and objectives of the designating proclamation or Act of Congress (BLM Manual 6220, section 1.6.B.1).

The BLM develops and updates its land use plans through a planning and NEPA (see Section 3.4) process that includes public involvement (43 U.S.C. 1712(a)). FLPMA also directs the BLM, when completing a planning process, to coordinate with other federal departments and agencies, state and local governments, and Tribal Nations, to seek consistency among land use plans across jurisdictions.

3.4 NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) establishes the broad national framework for protecting our environment. In NEPA, Congress directs "all agencies of the Federal Government…[to]…utilize a systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man's environment" (42 U.S.C. 4332(A)). The BLM is preparing an EIS concurrent with the RMP to examine a range of alternatives, including a No Action alternative, to resolve the issues in question. Alternatives should represent complete but different means of satisfying the identified purpose and need of the EIS and of resolving the issues. The RMP/EIS is being prepared using the best available information. Other federal laws, regulations, and policies, as well as applicable state, local, and other applicable regulatory frameworks, are identified in the following sections.

Further, the BLM plans to collaborate with other federal, state, and local agencies and governmental entities throughout the RMP process. Opportunities for coordination with other agencies will be sought throughout the RMP and EIS development process. Project phases where state and local governments, other federal agencies, and Native American Tribal government involvement could prove most helpful include scoping, alternatives development, impacts analysis, and public and agency comment periods.

3.5 OTHER APPLICABLE FEDERAL LAWS

In addition to the federal laws listed above, BLM planning decisions must comply with these other federal laws:

- **Clean Air Act**, as amended (42 U.S.C. 7418 et seq.) - Authorizes regulations to limit emissions from both stationary (industrial) sources and mobile sources.
- **Clean Water Act**, as amended (33 U.S.C. 23 et seq.) - Establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters.
- **Endangered Species Act of 1973**, as amended (ESA) (16 U.S.C. 1531-1544) - Designed to protect critically imperiled species from extinction as a "consequence of economic growth and development untempered by adequate concern and conservation."
- **American Indian Religious Freedom Act of 1978** (42 U.S.C. 1996 et seq.) - Protects the rights of Native Americans to exercise their traditional religions by ensuring access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites.
- **National Trails System Act of 1968** (Public Law [PL] No. 90-543; 16 U.S.C. 1241 et seq.), as amended - Calls for establishing trails in both urban and rural settings for people

of all ages, interests, skills, and physical abilities. Promotes the enjoyment and appreciation of trails while encouraging greater public access. It also establishes four classes of trails: national scenic trails, national historic trails, national recreation trails, and side and connecting trails.

- **Paleontological Resources Preservation Act of 2009** (16 U.S.C. § 470aaa 1-11) - Directs the USDA and USDI to manage and protect paleontological resources on Federal land using scientific principles and expertise. Public Law 111-011, Title VI, Subtitle D, is the BLM's legal authority governing casual collecting of common invertebrate and plant paleontological resources, or fossils, from public lands, as well as the issuance of permits for the collection of paleontological resources from public lands.
- **Antiquities Act of 1906** (54 U.S.C. § 320301-320303) - Enacted to help protect 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.
- **Archaeological Resources Protection Act of 1979**, as amended (16 U.S.C. 470 et seq.) - Governs the excavation of archeological sites on federal and Native American lands in the United States, and the removal and disposition of archeological collections from those sites.
- **Historic Sites Act of 1935** (P.L. 74-292 Stat. 666; 16 U.S.C. 461) - Established that "it is a national policy to preserve for public use historic sites, buildings and objects of national significance for the inspiration and benefit of the people of the United States."
- **Healthy Forests Restoration Act of 2003** (PL No. 108-148) - Empowers the Secretaries of Agriculture and the Interior to expedite projects designed to reduce hazardous fuels buildups and to restore healthy forest conditions on federal forest lands.
- **International Migratory Bird Treaty Act of 1918** (16 U.S.C. 703-711) - Implements four international conservation treaties that the US entered into with Canada in 1916, Mexico in 1936, Japan in 1972, and Russia in 1976 to ensure the sustainability of populations of all protected migratory bird species.
- **John D. Dingell, Jr., Conservation, Management, and Recreation Act** (PL No. 116-9) - Addresses land conveyances, exchanges, acquisitions, withdrawals, and transfers; national parks, monuments, memorials, wilderness areas, wild and scenic rivers, historic and heritage sites, and other conservation and recreation areas; wildlife conservation; the release of certain federal reversionary land interests; boundary adjustments; the Denali National Park and Preserve natural gas pipeline; fees for medical services in National Park System units; funding for the Land and Water Conservation Fund; recreational activities on federal or nonfederal lands; and federal reclamation projects.
- **National Historic Preservation Act** (NHPA), as amended (16 U.S.C. 470 et seq.) - Intends to preserve U.S. historic and archeological sites; it creates the National Register of Historic Places, the list of National Historic Landmarks, and the State Historic Preservation Offices.
- **Native American Graves Protection and Repatriation Act of 1990** (25 U.S.C. 3001 et seq.) - Outlines a requirement and process for museums and federal agencies to return certain Native American cultural items (including human remains) to lineal descendants, culturally affiliated Tribal Nations, or Native Hawaiian organizations.

- **Taylor Grazing Act of 1934** (43 U.S.C. 315 et seq.) - Provides for the regulation of grazing on public lands (excluding Alaska) to improve rangeland conditions and to regulate their use.
- **Public Rangelands Improvement Act of 1978** (43 U.S.C. Ch.37) - Establishes a commitment to inventory and identify current public rangeland conditions and trends while managing, maintaining, and improving the condition of public rangeland.
- **Wild and Scenic Rivers Act of 1968**, as amended (16 U.S.C. 1271 et seq.) - Preserves certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations.
- **Wilderness Act of 1964** (PL No. 88-577) - Creates a preservation system for the country's wild areas and require federal land management agencies to manage officially designated wilderness areas in such a way that preserves their wilderness character.

3.6 EXECUTIVE ORDERS

BLM planning decisions for this planning area are also guided by the following Executive Orders:

- **Executive Order 11593, Protection and Enhancement of the Cultural Environment** (36 F.R. 8921, May 13, 1971) - Directs federal agencies to inventory cultural properties under their jurisdiction, to nominate to the National Register of Historic Places all federally owned properties that meet the criteria, to use caution until the inventory and nomination processes are completed, and also to assure that federal plans and programs contribute to preservation and enhancement of nonfederal owned properties.
- **Executive Order 13007, Indian Sacred Sites** (61 F.R. 104, May 24, 1996) - Provides that in managing Federal lands, agencies-to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions-shall accommodate Indian religious practitioners' access to and ceremonial use of Indian sacred sites, shall avoid adversely affecting the physical integrity of such sites, and shall maintain the confidentiality of sacred sites.
- **Executive Order 13287, Preserve America** (68 F.R. 43, March 5, 2003) - Orders federal agencies to take a leadership role in protection, enhancement, and contemporary use of historic properties owned by the federal government and promote intergovernmental cooperation and partnerships for preservation and use of historic properties.

3.7 RELEVANT DOI AND BLM POLICIES

The RMP must be consistent with the following DOI and BLM policies:

- DOI Departmental Manual Part 516, Chapter 11, Managing the NEPA Process - BLM
- BLM Manual 1613 - Areas of Critical Environmental Concern
- BLM Manual 1626 - Travel and Transportation Manual
- BLM Manual 1745 - Introduction, Transplant, Augmentation, and Reestablishment of Fish, Wildlife, and Plants

- BLM Manual 1780 - Tribal Relations
- BLM Manual 2800-2809 - Land Resources Management Manuals
- BLM Manual 6100 - National Landscape Conservation System Management Manual
- BLM Manual 6120 - Congressionally Required Maps and Legal Boundary NLCS Designations
- BLM Manual 6220 - National Monuments, National Conservation Areas, and Similar Designations
- BLM Manual 6250 - National Scenic & Historic Trail Administration
- BLM Manual 6280 - Management of National Scenic and Historic Trails
- BLM Manual 6310 - Conducting Wilderness Characteristics Inventory of BLM Lands
- BLM Manual 6320 - Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process
- BLM Manual 6340 - Management of Designated Wilderness Areas
- BLM Manual 6400 - Wild and Scenic Rivers – Policy and Program Direction for Identification, Evaluation, Planning, and Management
- BLM Manual 6500 - Wildlife and Fisheries Management
- BLM Manual 6720 - Aquatic Resource Management
- BLM Manual 6840 - Special Status Species Management
- BLM Manual 7240 - Water Quality Manual
- BLM Manual 7250 - Water Rights
- BLM Manual 8100-8170 - Cultural Program Manuals
- BLM Manual 8320 - Planning for Recreation and Visitor Services
- BLM Manual 8400 - Visual Resource Management
- BLM Manual 9011 - Chemical Pest Control
- BLM Manual 9015 - Integrated Weed Management
- BLM Manual 9130 - Sign Manual
- BLM Handbook H-1601-1 - Land Use Planning Handbook
- BLM Handbook H-1740-2 - Integrated Vegetation Management
- BLM Handbook H-1780-1 - Improving and Sustaining BLM-Tribal Relations
- BLM Handbook H-1790-1 - NEPA Handbook
- BLM Handbook H-2000-1 - Pre-Acquisition Environmental Site Assessments
- BLM Handbook H-2100-1 - Acquisition
- BLM Handbook H-2200-1 - Land Exchange Handbook
- BLM Handbook H-2740-1 - Recreation and Public Purposes
- BLM Handbook H-2812-1 - O&C Logging Road Right-of-Way Handbook
- BLM Handbook H-8320-1 - Recreation and Visitor Services Planning
- BLM Handbook H-8342 - Travel and Transportation Handbook
- BLM Handbook H-8410 - Visual Resource Inventory
- BLM Handbook H-9011 - Chemical Pest Control Handbook

- BLM Handbook 9211-1 - Fire Planning Handbook
- BLM Handbook H-9214 & H-9241-1 - Fuels Management Handbook
- BLM Handbook 3042-1 - Solid Minerals Reclamation Handbook

3.8 Relevant Federal and Tribal Plans and Agreements

When developing and revising an RMP, the BLM must coordinate with approved land use plans, policies, and agreements of other federal agencies and Tribes to the extent consistent with the laws governing the administration of public lands. These plans, policies, and agreements can be on a nationwide, regional, or local scale.

3.8.1 BLM Resource Management Plans

- Cascade-Siskiyou National Monument Resource Management Plan (USDI BLM 2008)
- Southwestern Oregon Resource Management Plan (USDI BLM 2016c)
- Redding Resource Management Plan (USDI BLM 1993)

3.8.2 Wildlife/Habitat Plans

- Horseshoe Ranch Habitat Management BLM Plan (USDI BLM and California Department of Fish and Game 1983)

3.8.3 Species Recovery Plans

- Revised Recovery Plan for the Northern Spotted Owl (USDI FWS 2011)
- Recovery Plan for *Fritillaria gentneri* (Gentner's Fritillary) (USDI FWS 2003)

3.8.4 National Programmatic Agreements

- Programmatic Agreement Among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers regarding the Manner in Which the BLM Will Meet Its Responsibilities Under the National Historic Preservation Act (2012)

3.8.5 Watershed Plans

- North and South Forks Little Butte Creek Water Quality Restoration Plan (USDI BLM 2006)
- Upper Bear Creek Water Quality Restoration Plan (USDI BLM 2008b)
- Jenny Creek Water Quality Restoration Plan (USDI BLM 2011a)

3.8.6 Tribal Plans

The BLM is not aware of any Tribal plans that overlap with the planning area.

3.9 Relevant State and Local Plans

Section 202 (c)(9) of FLPMA requires the BLM to coordinate with, consider, and be consistent with approved state, local, and Tribal plans so long as they are consistent with federal laws and regulations. This section provides a list of the state and local plans the BLM is aware of as of publication of this AMS.

3.9.1 State Plans

State of Oregon and California regulations that may be germane to this planning process include:

- Rogue Basin Total Maximum Daily Load (Oregon Department of Environmental Quality [DEQ] 2008)
- Upper Klamath and Lost Subbasins Temperature Total Maximum Daily Load and Water Quality Management Plan (Oregon DEQ 2019)
- Klamath River Total Maximum Daily Loads Addressing Temperature, Dissolved Oxygen, Nutrient, and Microcystin Impairments in California (State of California North Coast Regional Water Quality Control Board 2010)

3.9.2 County Plans

The planning area is in portions of Jackson, Klamath, and Siskiyou counties. County plans that may be germane to this planning effort are:

- Jackson County Comprehensive Plan (2004)
- Klamath County Comprehensive Plan (1984)
- Siskiyou County General Plan – Land Use Policies (revised 10/09/1997)

Chapter 4. Purpose and Need

Purposes and needs serve to frame the issues identification, alternatives development, and effects analyses. The purposes of this RMP are to:

1. **Protect and restore the habitats that support the rare and endemic and special status wildlife and plant species.**

Challenges and opportunities: The CSNM encompass three geologically distinct mountain ranges with dramatic changes in elevation, aspect, and topography. This rare convergence of ecoregions results in a unique mosaic of habitat types including towering fir forests, sunlit oak groves, wildflower-strewn meadows, and steep canyons, all connected by a vast network of riparian systems (2000 Presidential proclamation 7318).

Endemic to these ecoregions is a spectacular variety of rare and special status species of plants and animals, who rely upon the ecological integrity (composition, structure, function, and processes) of intact habitats to maintain viable populations. Rare and endemic, and special status species have evolved to live in habitats that contain elements, such as soils, hollow trees, and microclimate, that limit their distribution and prevent these species from being more widespread (Cartwright 2019; Vincent et al. 2020; Corelett and Tomlinson 2020).

The Southern Cascades ecoregion, for example, includes an elevational range between 3,500 and 6,000 feet and is characterized by gentle to moderately sloping promontories and broad valleys with extensive meadows. This mixed-conifer forest habitat is interspersed with a network of streams, montane meadows, wetland, and perennial springs. The heterogeneous habitats distributed across this landscape is critical habitat for a broad range of wildlife including the northern spotted owl, northern goshawk, American marten, and Pacific fisher, Johnson's hairstreak butterfly, Pacific pond turtle and the boreal toad (Frost et al. 2011). The mosaic of interconnected habitat throughout all ecoregions in the CSNM supports outstanding biodiversity.

Some of the habitats within the CSNM were initially protected as ACECs or RNAs, established to safeguard rare, endemic, and special status species that require special management attention (BLM Manual 1613 – Areas of Critical Environmental Concern; 43 CFR 8223.0-5). Oregon Gulch, for example, protects sensitive status plants including Greene’s mariposa lily, Howell’s false-caraway, and Bellinger’s meadowfoam (USDI BLM 2008, Appendix L).

The CSNM proclamations and National Land Conservation System (NLCS) strategy provide additional opportunities for the BLM to manage ecosystem components as an integral part of the larger landscape on behalf of rare and endemic, and special status species. These components may include elements essential to an animal’s life cycle, like meadows within mature conifer forests for great grey owls, and large trees with cavities in open forests for western bluebird nesting. Keystone species, such as beavers, may be returned to restore the ecosystem integrity of healthy riparian systems (USDI BLM 2011b).

Public engagement and visitor education help tell the story of public land conservation and foster strong community partnerships (USDI BLM 2011b). The Mariposa Lily Botanical Area utilizes community science and volunteer engagement to cultivate a sense of local, shared stewardship. This educational outreach also provides the BLM with valuable scientific information to better manage the special status plant, Greene's mariposa lily. Using Traditional Indigenous Knowledge may also provide management opportunities for preserving and enhancing the habitats supporting rare and endemic and special status species.

The challenge of the CSNM is the habitat fragmentation and loss resulting from historic resource management and discretionary uses, such as timber harvest, road building, livestock grazing and fire suppression. Degraded habitat, in combination with climate change, threatens rare and endemic and also special status wildlife and plants species in some locations (Liu et al. 2019; Parker 2021; Corelett and Tomlinson 2020).

2. **Protect and restore the connectivity of habitats that allow for animal migration and movement.**

Challenges and opportunities: Given the checkboard ownership patterns within the CSNM boundary, maintaining connectivity can be particularly challenging. Actions taken by other ownerships affect connectivity by increasing the amount of edge and decreasing interior habitat (Haddad et al. 2015). Fragmentation reduces habitat size, isolating plant and animal populations, and diminishing ecological processes such as pollination, seed dispersal, predator-prey interactions, water and nutrient cycling, and resilience to fire.

Habitat fragmentation from timber harvest and road building have created gaps in mature forest larger than some wildlife species can successfully cross without being subject to predation or other mortality factors. The lack of interior habitat in mature forest is the primary limiting factor preventing species movement throughout these habitats (Frost 2018; Frost et al. 2011). Because of past actions on lands within the planning area, interior habitat of mature forests is the most limited type of habitat.

Rivers and streams throughout the planning area have lost their connections to their floodplains through beaver trapping, water diversion, timber harvest, and livestock grazing (USDI BLM 2005, pp. 64-70; ODFW 2016). The loss of flooding alters river dynamics, resulting in less clean gravel for spawning beds, loss of stream complexity, changing temperatures, nutrient and oxygen levels, negatively impacting both aquatic and terrestrial habitats (USDI BLM 2005, pp. 64-70; ODFW 2016). Streams can be reconnected to their floodplains by restoring off-channel habitats and oxbows cut off by previous channel modifications, reintroduction of beaver, restoring mainstream and tributary habitats, removing dams and revetments, replacing culverts, and replanting streambank vegetation (ODFW 2016).

There are over 800 miles of roads crisscrossing the planning area (see section 6.21), particularly north of Highway 66. Roads have been identified as a major factor involved in habitat fragmentation (*Conservation Biology* 2001 special feature on roads), and associated with the decline of wildlife including ungulates, large carnivores, and salmonids (Noss et al. 1996; Trombulak and Frissell 1999; *Conservation Biology* 1996, 2001; PRC 2002; Heilman et al. 2002; Staus et al. 2002).

The BLM has the opportunity to restore habitat connectivity in the planning area using corridors, or linkages between existing protected areas. Habitat corridors can be defined as environmental spaces, either natural, maintained or restored, between species, ecosystems, and ecological processes at various scales. Examples of habitat corridors include river systems, restored habitat pathways (at a variety of scales), and even tunnels and underpasses. Corridors reduce fragmentation, increase habitat heterogeneity, and allow for restored ecological processes (Frost 2018).

The effective use of corridors can provide opportunities to examine a wide range of resource-use opportunities and provide a scientific foundation for decision-making. Corridors can be evaluated on measurable outcomes such as increasing the flow of nutrients across the landscape, the presence and movement of animals, geneflow between plant populations (measured as seed set and recruitment), and ability of low-intensity fire to move through a landscape with minimal damage to the habitat (Dickson et al. 2016). Research on assisted migration (the deliberate movement of species to new sites when there is no migratory pathway or conditions are changing faster than a species can migrate), may support species persistence (Butt et al. 2020). Focal species and/or assemblages may be used to model and monitor the effectiveness of connectivity for wildlife (Bennett 1999).

3. **Protect and restore habitats to be resistant and resilient to disturbance.**

Challenges and opportunities: Environmental processes supporting biodiversity require a range of habitats that can be resistant and resilient to large-scale disturbance such as fire, insects and disease, invasive species, drought, or floods, which are events likely to be made worse by climate change (2016 Presidential proclamation 9564).

Within the planning area, the BLM has the opportunity to prioritize protection and restoration of a range of habitats distributed across the landscape (habitat heterogeneity) to provide resistance and resilience. Research indicates that habitat ranges for many species may shift to avoid extinction (Taylor 2006). Protection of a variety of habitats across the landscape may allow species to make these shifts. Drought, insect, and fire risks can be addressed through vegetation management actions designed to reduce stress and select for species more likely to recover and persist.

Historically, the open structure of habitats was maintained by disturbance such as fire, floods, and storms. Fire suppression, dam building, and stream channeling changed how habitats respond to disturbance (Taylor 2006). Woody plants have invaded grasslands, and increased fuel loads have contributed to insect outbreaks, forest fuel loading, and uncharacteristically severe fires. Hydrologic changes have resulted in loss of floodplain function and reduced riparian habitats negatively impacting fish and wildlife populations (ODFW 2016).

The response of healthy habitats to disturbance can be described as resistance and resilience. Resistance is the capacity of ecological processes to continue to function without change following a disturbance (USDA ARS et al. 2005), and resilience is the capacity of ecological processes to recover following a disturbance. Resilience can be defined in terms of rate of recovery, extent of recovery during a particular period of time, or both (USDA ARS et al. 2005) (BLM Handbook H-1740-2, Rel. 1-1714 - Integrated Vegetation Management Handbook).

Additional opportunities include riparian restoration, managing to protect special status species, controlling invasive, non-native plants to prevent habitat degradation, and active management of fire-dependent habitats (such as grasslands and oak savanna).

Long-term drought has led to declining stream flows and historically low reservoir levels, which impacts aquatic habitats and species that depend on them both within and beyond the planning area. Drought and insect damage has resulted in substantial mortality in forest stands, increasing fuel loading and reducing resilience to fire (see Section 6.28.2). Climate change, which is predicted to increase drought, increases the risks of large-scale, high-severity disturbances that can adversely impact CSNM objects and values. In this way, climate change also affects the timing and quantity of stream flows, and water storage in reservoirs, ponds, and wetlands.

An emerging concern among forest scientists is the so-called "zombie" forest: a forest dominated by species that can no longer successfully reproduce or reestablish following disturbance due to changes in local climate (Bell et al. 2014; Davis et al. 2019; Taccoen et al. 2022; Hill 2022). Recently identified in the Sierra Nevada forests of California (Hill 2022), zombie forests may be present within the planning area given the increasing drought-related mortality of species such as Douglas-fir (see Section 6.22). Actions taken to reduce the risks of large-scale, high severity disturbances can allow the BLM to develop a "glide path" for these forests and reduce or minimize sudden, large-scale change to forest habitats and species that depend on them (Lin and Peterson 2013).

Climate change is expected to significantly affect natural resources in the planning area by increasing the frequency and severity of disturbances (Peterson et al. 2011; Pickrell 2019). The post-disturbance change in environmental conditions may prevent species from successfully reestablishing and persisting (Cartwright 2019; Vincent et al. 2020; Corelett and Tomlinson 2020).

The effects of climate-mediated habitat loss, which are inherently scale- and species-dependent, require control studies of intact habitat. The planning area contains abundant intact habitat available as representative controls for resistance and resilience studies. The planning area provides scientists, educators, and land managers with an important resource for learning to incorporate the uncertainties of climate change into long-term planning.

4. **Reduce fire risk within the wildland urban interface and to CSNM objects and values.**

Challenges and opportunities: Managing fire risks in the wildland urban interface (WUI) is challenging due to differences in financial capability and owner objectives for their inholding and adjacent lands relative to the BLM's capabilities and objectives. Federal policy and budget direction is to manage BLM-administered lands in the WUI to reduce risks to both the adjoining private lands and the public lands. Wildfires can start on BLM-administered lands and spread into the WUI, and fires can start on private lands and spread onto BLM-administered lands (USDI BLM 2008, p. 28). The WUI includes rural residential homes; the small communities of Greensprings, Lincoln, and Pinehurst; and private and industrial forests.

The primary concern with wildfires on BLM-administered lands is the potential fire severity and resulting adverse impacts to CSNM objects and values. The primary concern with wildfires on private lands is wildfire size, intensity, and severity as they threaten structures, commercially important resources, and other values held by the landowner (Situation Report). Adequate funding for both the BLM and the specific landowner can remain an issue along with adjoining landowner fears of prescribed fire escapes. For example, the amount of fuels treatment within the planning area on BLM-administered lands has been declining since 2000 (see Section 6.28.1). Some landowners may also prefer to leave some untreated areas on or near their property to provide privacy screening. Actions taken on just BLM-administered lands or just on private landowner property may not succeed as well as when both the BLM and the private landowner take joint action to reduce risks.

Fuels management actions to reduce the risks of unwanted severity levels and assist in controlling the spread of wildfires are well-established for forest ecosystems, especially for dry forests (e.g., Weatherspoon 1996; Agee et al. 2000; Finney 2001; Loehle 2004). Most often such treatments are comprised of linear fuelbreaks although including area treatments further away from the specific site can also serve to reduce the intensity of a wildfire as it approaches the fuelbreak (Finney 2007; Salis et al. 2016; Thompson et al. 2016; Metlen et al. 2017; Tubbesing et al. 2019; Stratton 2020). Such treatments involve reducing ladder fuels in the form of shrubs, small trees, and low tree branches; creating wider spacing in the tree canopy; and encouraging the presence of native grasses and forbs to reduce the risks of crown fire, reduce flame lengths, and provide conditions allowing for the use of burnout operations to remove the existing surface fuels (grass, needles, and similar fuels) (Agee and Skinner 2005). Firefighters then have safer locations in which to construct fireline and successfully stop the fire from reaching high-value resources. Treating only BLM-administered lands to reduce wildfire risks may require treating a larger area within the planning area to achieve the desired level of risk reduction to both CSNM objects and values and the adjoining private land but also has a risk of adversely affecting CSNM objects and values within the needed treatment area. Avoiding such impacts can complicate treatment design.

5. Manage discretionary uses to protect CSNM objects and values.

Challenges and opportunities: Public land uses in the CSNM, such as recreation, livestock grazing, and access are important to the economic opportunities and quality of life of the local communities surrounding the CSNM. These uses, among other uses, can present management challenges and opportunities for the BLM. Since designation in 2000 and the expansion in 2017, controversy and disputes have existed among stakeholders regarding BLM's discretionary uses, particularly since, as noted above, the designation of the CSNM as a national monument requires the BLM to protect the objects and values within its boundary. Interests span the spectrum from supporting a wide variety of uses and activities to promoting strong preservation interests. For example, retaining existing grazing permits may be desired by grazing permittees but certain environmental groups and individuals would prefer to eliminate grazing. Similarly, unauthorized off-road vehicle users can damage CSNM objects and values, such as rare and endemic plant populations if poorly controlled. Such users, however, may object to control measures that limit access to particular areas. Establishing management that best protects CSNM's objects and values while considering other compatible uses is vital in this planning effort.

Recreation is an important part of the user experience in the CSNM. The major recreational activities in the area include hiking on the Pacific Crest National Scenic Trail and other trails in the area; bicycling and mountain biking; camping at Hyatt Lake Campground and Surveyor Recreation Site; rock climbing at Pilot Rock; horseback riding; driving for pleasure; mushroom hunting; dispersed camping; hunting throughout the planning area; and Nordic skiing and snowmobiling on miles of groomed trails in the winter. Visitation has increased by more than 22 percent in the past 10 years. With the ease of access and diversity of recreational opportunities available in the CSNM, the BLM expects the demand for recreation use of BLM-administered lands in the CSNM to continue to increase. The BLM has the opportunity to explore how recreation can be used as a tool for protecting CSNM objects and values through interpretive trails and educational opportunities.

Approximately 25 percent of the BLM-administered lands in the planning area are actively being grazed by livestock (see Section 6.10.1). On those lands, grazing has been occurring between 50-80 percent of the allotted use (see Section 6.10.2). Within national monuments, the BLM must implement grazing management practices in a manner that protects monument objects and values unless otherwise provided for in law, and use innovative grazing techniques designed to better conserve, protect, and restore the monument values, where consistent with the designating legislation or proclamation (BLM Manual 6220, Section 1.6.I.1-2).

In 2008, after completion of extensive studies of the impacts of livestock on the objects of biological interest in the CSNM, the BLM determined that "there are locations within the CSNM where current livestock grazing practices are not compatible with "protecting the objects of biological interest" as directed by the presidential proclamation" (USDI BLM 2008c and USDI BLM 2008d). After the livestock impact studies were completed, but before the BLM reached a decision on the final compatibility determination, Congressional Representatives worked with stakeholders to create legislation that allowed for the permanent retirement of leases in the original boundary of the CSNM. Section 1402 of the 2009 Omnibus Public Lands Management Act (Public Law 111-11) provided for the permanent retirement of leases that were voluntarily relinquished by lessees (see Section 6.10, Livestock Grazing). Most of the current livestock grazing occurs in the CSNM expansion area.

Grazing continues to present resource concerns in the planning area. For example, a persistent challenge with livestock grazing management in the planning area includes fencing issues that arose when several leases were donated in 2009. The lease donations led to lack of fence maintenance responsibilities and the need for new fencing between the active and retired allotment boundaries. These fencing issues have allowed livestock to wander out of their designated areas. The BLM has the opportunity to explore using innovative grazing management techniques to better conserve, protect, and restore the CSNM objects and values. Grazing management techniques might include rotational grazing, season-of-use adjustments, fencing solutions from past allotment donations, continually improving rangeland health, allotment monitoring, salting plans to pull livestock away from sensitive habitats to uplands, and the protection of the objects of biological diversity with constructed features.

The checkerboard land ownership pattern within the planning area generates most of the challenges and needs to cross public lands in order to provide access and utilities to intermingled private lands. The BLM generally does not know the location and nature of such proposals until

the BLM receives an application. Currently, the BLM issues the most right-of-way (ROW) grants over BLM-administered lands in the planning area for access roads. Access roads are used for ingress/egress to private residences, commercial properties, and commercial timber harvest on private lands. Access to private lands and public lands over existing roads for non-commercial purposes is considered casual use and does not require a ROW in most cases. However, most of the ROW grants for this use are driven by circumstances including legal access for title closure during home or property sales, title insurance, or county permitting requirements. The BLM can grant ROWs to satisfy those circumstances even though the use is consistent with casual use. Public utilities (water, sewer, phone, internet), power lines, that serve the private landowners or the public in general would require a ROW grant and are discretionary in most cases. Currently, many Lands and Realty activities occur under "casual use" and do not rise to the level of requiring a formal authorization. Currently there are many landowners without any legal authorization, who access their properties under casual use, until the need for documented legal access is required. Per 43 CFR 2801.5(b), casual use is "activities that involve practices which do not ordinarily cause any appreciable disturbance or damage to the public lands, resources or improvements and, therefore, do not require a right-of-way grant or temporary use permit under this title."

Chapter 5. Issues and Analytical Framework

This chapter of the AMS outlines the preliminary planning criteria associated with the development of the CSNM RMP/EIS. The planning criteria lay the groundwork guiding effects analysis by identifying issues and their analytical frameworks. Analysis of the issues will look at timeframes necessary for evaluating how the alternatives will affect the resources or desired resource conditions. In some cases, the temporal scales for analysis will be influenced by the relationship between the decisions being considered in the alternatives and the timeframes in which those decisions would direct the scope of work to achieve the desired outcomes in the RMP.

5.1 Areas of Critical Environmental Concern and Research Natural Areas

5.1.1 How would the alternatives affect the relevant and important resource values of existing and proposed Areas of Critical Environmental Concern (ACECs), Research Natural Areas (RNAs), and the Mariposa Lily Botanical Area?

Background

- Areas of Critical Environmental Concern (ACECs) are natural features and ecosystems that contain relevant and important values, and which require special management attention to protect these values as defined in 43 CFR 1610.7-2 and MS-1613, Areas of Critical Environmental Concern. The relevant and important values of ACECs include historical, cultural, or scenic values; fish and wildlife resources; natural systems and processes; or to protect life and safety from natural hazards. The ACEC designation indicates to the public that the BLM recognizes an area has relevant and important values and has identified special management prescriptions to protect those values.
- The BLM is required to evaluate existing and nominated ACECs during the resource management planning process. At the evaluation stage, the BLM must determine if there is evidence that the values identified in the nominations meet the criteria for both relevance and importance and whether there would be a need for special management attention (MS-1613).
- All areas in the planning area that have relevant and important values and may require special management attention would be considered for potential designation as an ACEC under at least one alternative in the RMP.
- The BLM allows ACECs to overlap other designations, such as wilderness, wild and scenic rivers, etc. Management of ACECs, however, should be thought of independently of these areas (MS-1613, chapter 5). If the management attention provided under another Congressional designation or agency's designation is adequate to protect the resource or value, it is not necessary or appropriate to designate it as an ACEC (MS-1613, chapter 5, sections 1 and 2).
- To be designated as an ACEC, an area must require special management attention to protect the important and relevant values (43 CFR 1601.0-5(a)). "Special management attention" refers to management prescriptions developed during preparation of an RMP

expressly to protect the important and relevant values of an area from the potential effects of actions permitted by the RMP. These are management actions that would not be necessary if the relevant and important values were not present.

- The BLM Land Use Planning Handbook (H-1601-1, Appendix C, Program/Resource-Specific Decision Guidance, section III.B.4., Administrative Designations) says to "Designate research natural areas (RNAs) and outstanding natural areas as types of ACECs using the ACEC designation process."
- Lands in RNAs serve as prime examples of distinct natural features and ecosystems. The BLM participates in both federal and statewide efforts to protect the intact ecosystems conserved in RNAs. The Federal Research Natural Area program protects a network of federally administered public lands for the primary purposes of maintaining biological diversity, providing baseline ecological information, and encouraging research and natural-history education. The Oregon Legislature established the Oregon Natural Areas Program in 1979 (ORS 273.561-.591 [SB 448]) to coordinate protection of natural areas in Oregon.
- In the BLM, RNAs have one or more of the following characteristics: (1) a typical representation of a common plant or animal association; (2) an unusual plant or animal association; (3) a threatened or endangered plant or animal species; (4) a typical representation of common geological, soil, or water features; or (5) outstanding or unusual geological, soil, or water features (43 CFR 8223.0-5).
- The Mariposa Lily Botanical Area was designated by the BLM in 1993 and carried forward as a designation in the 2008 CSNM RMP (USDI BLM 2008, p. 14). This unique area provides a core, relatively undisturbed, reference area that contains large populations of Green's mariposa lily (USDI BLM 2008, p. 104). The BLM will evaluate this area for designation as an ACEC using the ACEC designation process.

Geographic Scale of Analysis

- The decision area

Relevant Assumptions

- Impacts on designated and proposed ACECs\RNAs would result from management actions that would fail to protect and so would cause irreparable damage to the identified relevant and important values.

Analysis Methodology and Techniques

- To determine whether the management actions of each alternative would protect or prevent from damage the relevant and important values associated with each potential ACEC/RNA, the BLM would using the following methodology:
    - List and map the locations of existing and potential ACECs/RNAs by alternative.
    - List the important and relevant values associated with each ACEC/RNA.
    - Determine the special management attention needed to protect or prevent irreparable damage to the relevant and important values by alternative.

- Designation is based on whether special management is required. The rationale for designating or not designating an ACEC/RNA using the following categories satisfies the disclosure requirement:
  - **Yes** – The BLM would designate the entire ACEC/RNA. The area requires special management attention to protect or prevent irreparable harm to the relevant and important values.
  - **No-1** the BLM would not designate the ACEC/RNA because the area does not require special management attention to maintain the relevant and important values. The management direction for other resources protects and/or maintains the relevant and important values for each ACEC/RNA.
  - **No-2** the BLM would not designate ACEC/RNA because of conflicts with other management priorities.
  - **No-3** the BLM would not designate the ACEC/RNA because there are no reasonable special management actions which can be taken to protect the resource from irreparable damage or to restore it to a viable condition.

Units of Measure

- Acres within each designated and proposed ACEC/RNA that would be affected by management actions or allowable uses.

Relevant Data and Information to Be Used

- Spatial and attribute data for existing and potential ACECs.
- Relevant and Important Value categories
- Special management attention needed to protect or maintain the relevant and important resource values for which each ACEC was designated or nominated.
- Existing RNA management plans
- Management action descriptions for ACEC/RNAs under each alternative

Analytical Conclusions to Be Answered

- Provide a description of how management activities and direction for each alternative would affect the relevant and important values of the ACECs, both for those that receive designation and special management attention and those that do not receive designation.
- Under some alternatives, the BLM may conclude that some designated or proposed ACECs require no additional special management attention to protect the relevant and important values, and, therefore, ACEC designation is unnecessary.

Analysis Display

- A map of the ACECs by alternative.
- A narrative discussion of the effects of each alternative.
- Tables that show a breakdown of proposed ACEC acreages, designations by alternative, applicable relevant and important values, and the necessary special management attention prescriptions.

5.2 CLIMATE CHANGE

5.2.1 What would be the BLM's expected contribution to greenhouse gas emissions from vegetation management activities such as science-based ecological restoration and hazardous fuels reduction?

Geographic Scale of Analysis

- The decision area; Oregon, California, and the United States would be used for broader context.

Relevant Assumptions

- Emissions from harvesting operations are 0.039 calculate tonnes (Megagrams) of carbon (Mg C) per 100 ft3 (Sonne 2006). This accounts for harvest operations, post-harvest site preparation except for prescribed burning, and tree planting.
- Emissions from prescribed burning are 150 Mg CO_2e (carbon dioxide equivalent) per acre in wet forests and 85 Mg CO_2e per acre in dry forests (estimate based on First Order Fire Effects Model; Reinhardt 2003).
- Current trends in annual acres burning in wildfires and in proportion of different fire severity types continues (may need to adjust based on level of harvesting by alternative), or acres burned increases by mid-century by percentages described in recent climate change literature.
- For cumulative effects analysis purposes, emissions from other federal lands, state and private lands, and emissions from enteric fermentation of cattle grazing on BLM allotments follow current trends.

Analysis Methodology and Techniques

- Use estimates of cubic feet harvested calculated for carbon storage analysis to estimate emissions from harvest operations in years 20 and 100.
- Estimate annual greenhouse gas emissions from prescribed burning in years 20 and 100.
- Estimate annual greenhouse gas emissions from wildfires in years 20 and 100.
- Estimate annual greenhouse gas emissions from enteric fermentation from cattle grazing on BLM allotments based on permitted animal unit months (AUMs).
- For context, compare emissions from BLM-authorized activities with greenhouse gas (GHG) emissions at other geographic scales (Oregon, California, and nationally) and other equivalency metrics (such as emissions from carbon sequestered by acres of national forests annually).

Units of Measure

Metric tons of carbon dioxide, methane, and nitrous oxide emissions and their CO_2e.

Relevant Data and Information to Be Used

- Cubic foot of timber harvested
- Annual prescribed burning acres 1994-2022
- Annual wildfire acres 1987-2022
- Proportion of different wildfire severity classes 1987-2022

- Estimate of permitted AUMs for cattle grazing in BLM allotments
- National Oceanic and Atmospheric Administration State Climate Summary for Oregon (Frankson et al. 2022)
- National Oceanic and Atmospheric Administration State Climate Summary for California (Frankson et al. 2022)
- Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021. U.S. Environmental Protection Agency. (EPA 2023)
- Graphs of CO_2e emissions by analyzed timeframes
- Graphs of net C emissions/storage by alternative (combines analyses for Issues 1 and 2)

Analytical Conclusions to Be Answered

- Total estimated GHG emissions by alternative.

Analysis Display

- Graphs of estimated GHG by alternative.

5.2.2 What would be the effects of BLM vegetation management activities, such as science-based ecological restoration and hazardous fuels reduction, on long-term net carbon storage?

Geographic Scale of Analysis

- The decision area

Relevant Assumptions

- Carbon comprises approximately 50 percent of plant biomass (Smith et al. 2006; USDOE 2007).
- Some level of carbon remains stored in forest products, with the life expectancy of that carbon storage varying with the type of forest product (Earles et al. 2012).
- Waste wood products are stored in sanitary landfills where decay rates are very slow.
- There are no net changes in soil carbon stocks, understory vegetation, or litter/duff on BLM-administered lands (refer to Van Deusen and Heath 2014 on their Carbon Online Estimator). Therefore, any changes in net carbon storage would be limited to carbon stored in overstory vegetation.
- Six board feet equals one cubic foot, accounting for kerf and wastage in the milling process.
- Climate change does not substantially alter carbon storage capability across the analysis area (although carbon storage capability will likely change in the long-term [100 years], we have no way to estimate how that capability will change and at what rate).

Analysis Methodology and Techniques

- Estimate the mix of stand structure types at present, in years 20 and 100 of alternative implementation.
- Estimate carbon storage in live trees from tree tables using the following process:
    - Convert standing tree volumes from board feet to cubic feet.

    - Convert tree volume to density (lb./ft^3) using the specific gravity of key species when green and typical moisture content of the heartwood (Ross 2010; Simpson 1993).
    - Biomass for entire live trees (foliage, branches, bark, and roots) equals biomass derived from tree volume multiplied by 1.85.
    - Divide pounds of carbon in live trees by 2200 to calculate Mg C.
- Estimate carbon storage in other forest components using the following process:
    - Assign median age for each stand structure type.
    - Estimate Mg C per acre for snags, understory, dead downed wood, and forest floor in each stand structure type for each forest type based on regional outputs from the Carbon Online Estimator, for the following regions:
        - Southwest Oregon (dry forests)
    - For estimating Mg C per acre in woodlands, use Carbon Online Estimator outputs for age 100 for western juniper and the average for age 100 for California black oak and Oregon white oak.
- Estimate remaining Teragrams (Tg) C stored in wood products from past harvesting.
- Estimate expected Tg C stored in wood products over time from harvesting under each alternative.

Units of Measure

- Teragrams of carbon (Tg C); 1 Tg C = 1,000,000 Mg C.

Relevant Data and Information to Be Used

- Estimates of tree volume for key species in dry forests.
- Age used to represent each successional stage in dry forest types.
- Estimates of carbon stocks by category (e.g., snags and understory) for the different successional stages.
- Estimates of volume used for different product types (lumber and plywood, pulp and paper, biomass for energy or heat production).
- Estimates of life expectancy of carbon in different forest product types.

Analytical Conclusions to Be Answered

- Rank alternatives by the highest to lowest expected carbon storage over time.
- The degree of difference between the alternatives based on estimated total above-ground carbon and carbon in live trees stored in years 20 and 100 (expressed as a central tendency and as a range or error bars, if feasible) by alternative.

Analysis Display

- Graphs of estimated carbon storage by alternative.

5.3 CULTURAL RESOURCE MANAGEMENT

5.3.1 How would BLM management actions affect cultural resources?

Background

- BLM 8100 Manual defines cultural resources as a definite location of human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral evidence. The term includes archaeological, historic, or architectural sites, structures, or places with important public and scientific use, and may include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups.
- The National Historic Preservation Act (NHPA) defines historic properties as any "prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register of Historic Places, including artifacts, records, and material remains related to such a property or resource."

Geographic Scale of Analysis

- The decision area

Relevant Assumptions

- The number of previously recorded sites is not a good indicator of how many undiscovered sites there may be in the planning area. Most surveys are driven by compliance with Section 106 of the National Historic Preservation Act and focus on resource extraction, leaving a variety of ecological or environmental areas unexamined for cultural resources.
- Flagging cultural sites for avoidance protects those sites from adverse effects of management actions.
- Not all cultural and historic resources have been identified in the planning area. Based on the known number of recorded cultural sites and the low percentage of survey (less than 30 percent of the planning area) it is probable that there are many unidentified cultural and historic resources within the planning area.
- Looting, vandalism, natural processes, wildland fire, public land use, and land management activities continue to variably impact cultural resources through ground disturbance, among other human-related activities and natural processes which have potential to affect their condition, character, and integrity.
- As recreational use of the planning area continues to rise due to increased visitation, impacts to cultural resources are expected to increase. Unauthorized collecting, theft, and vandalism occur now and would continue.

Analysis Methodology and Techniques

- Identify where proposed management actions would overlap with locations of known cultural sites based on cultural surveys.
- Identify high probability areas not inventoried using predictive modeling in GIS, along with Tribal input and historic research. This would assist in developing a cultural

resource survey strategy to locate historic properties in the planning area for protection/avoidance from current and future management actions.

- Categorize management actions to show those which do not ordinarily have the potential to effect cultural resources, and those which create new ground disturbance and do have the potential to effect cultural resources (shown in tabular form).

Units of Measure

- The number of known cultural resources in the planning area subject to impacts from management actions and allowable uses (such as ground-disturbing activities), if unable to protect through avoidance measures.

Relevant Data and Information to Be Used

- BLM GIS Data including LiDAR, SHPO Online database, previous survey and site location information regarding cultural resources, as well as management goals and objectives specific to cultural resources in the planning area.
- A Class I Cultural Resource Overview of the planning area is scheduled to be completed in 2023, which includes an in-depth look at the prehistory, history, and ethnological/sociological elements of past land uses within the planning area. The report would provide a comprehensive view of all the known archaeological, historic, cultural, and traditional places and the probable locations of currently unknown cultural resources within the planning area.

Analytical Conclusions to Be Answered

- How would the proposed management by alternative impact known cultural resources.

Analysis Display

- Describe known and inferred site locations potentially impacted by alternative, as appropriate and in accordance with applicable law.
- Describe potential impacts to cultural resources and methods to avoid adverse effects. In tabular form, show the different levels of the potential for adverse effects to cultural resources by alternative.

5.4 AQUATIC AND RIPARIAN SPECIES AND HABITAT

5.4.1 How would ground-disturbing management actions and allowable uses proposed under each alternative affect aquatic and riparian habitats and aquatic species?

Geographic Scale of Analysis

- Geographic scale of analysis will be at the 6th field sub-watershed scale and will include all sub-watersheds fully or partially within the planning area boundary.

Relevant Assumptions

- One site Potential Tree Height width Riparian Reserves are sufficient to protect and promote aquatic and riparian resources by precluding sediment transport from upland areas, (Rashin et al. 2006), providing stream-channel shade, and a source of large wood recruitment to streams (Groom et al. 2003; Reeves et al. 2003).

- No changes to water management would occur.
- Climate trends would continue and amplify (see Section 6.4).
- Adjacent lands would continue to be managed as they are currently (private forest lands would continue to be cut on predictable rotations, rangelands would continue to be grazed, etc.).

Analysis Methodology and Techniques

- Determine acres of Riparian Reserve by vegetative class (e.g., meadow vs forested).
- Identify degraded riparian or instream habitats and cause(s) of degradation.
- Identify proposed ground disturbing activities, determine if they are hydrologically connected to aquatic habitat and could affect riparian and aquatic habitats and aquatic species, and determine the potential and magnitude of impacts (both positive and negative) to aquatic habitats.

Units of Measure

- Cubic yards of fine sediment.
- Percent channel shade.
- Miles of sensitive riparian areas.

Relevant Data and Information to Be Used

- Hydrologic data such as road densities and stream crossings by sub-watershed, and water quality and quantity data which is relevant to aquatic habitat.
- Acres of Riparian Reserves by vegetative class
- Miles of fish bearing streams and proximity to any proposed ground disturbing activities
- Stream habitat inventories (BLM and ODFW data)
- Stream gage data (Jenny Creek)
- Aquatic organism population studies and data (Jenny Creek suckers and red-band trout)
- BLM livestock grazing data (e.g., AUMs, season of use, known impacts from grazing allotments).

Analytical Conclusions to Be Answered

- The relative efficacy at maintaining and improving aquatic habitat, and to what degree each alternative would affect/benefit population and aquatic and riparian habitat resiliency, considered in the context of climate change forecasts.

Analysis Display

- Primarily narrative with some tables and charts.
- Maps of fish distribution, riparian areas by vegetative condition, and areas identified as priorities for riparian and instream restoration.

5.5 GEOLOGY AND PALEONTOLOGY

5.5.1 How would recreation management actions proposed under each alternative affect the unique geologic and paleontological resources?

Background

- Recent geologic mapping has provided an improved understanding of the geologic and paleontological resources and allowed for better identification of unique features and their potential to enhance the public enjoyment of the CSNM.

Geographic Scale of Analysis

- The decision area

Relevant Assumptions

- Increased traffic to interpreted areas causes both beneficial and adverse effects to geological and paleontological resources. Potential beneficial effects would be an increase in public awareness and appreciation of unique geologic and paleontological resources is considered a beneficial effect. Potential adverse effects would be an increase in the potential for human-caused physical degradation on unique geologic and paleontological features.
- Once negatively impacted, geologic and paleontological features are not likely to return to their original condition.

Analysis Methodology and Techniques

- Each unique geologic and paleontological feature would be analyzed qualitatively under each alternative for susceptibility to physical damage from the proposed recreation management actions.
- Each unique geologic and paleontological feature would be analyzed qualitatively under each alternative for the public benefit that would be provided by the proposed recreation management actions.
- For each alternative, the adverse effects would be compared against the beneficial effects for a qualitative net effect determination for each proposed recreation management action.

Units of Measure

- The number of current locations of unique and interpreted geologic and paleontological features or with the potential to be interpreted and experience high visitation.

Relevant Data and Information to Be Used

- Locations of unique and interpreted geologic features or those with the potential for future interpretation.
- Potential Fossil Yield Classification System data.
- Estimates of visitor numbers per year.
- Estimates of scientific studies per year.

- CSNM geology-specific research papers, publications, maps, and interpretive materials (Carlini and D'Allura 2018; Castro and D'Allura 2021; Cooke and D'Allura 2020; D'Allura 1997; D'Allura 2017; D'Allura et al. 2021; Hillard and D'Allura 2023; Sweetland and D'Allura 2017).

Analytical Conclusions to Be Answered

- Determine the number of unique geologic and paleontological sites and anticipated impacts on those sites under each alternative.

Analysis Display

- A geologic map with locations of unique geologic and paleontological features.

5.6 HYDROLOGY

5.6.1 How would vegetation management actions and allowable uses in the proposed alternatives affect water quantity (peak flows and base flows) and water availability?

Geographic Scale of Analysis

- The sub-watersheds (6^{th} field hydrologic unit codes [HUCs]) that cross into the planning area. The sub-watershed level was chosen for this analysis because it better captures the BLM forested land pattern at closer to a site scale.

Relevant Assumptions

- No changes to current water management would occur. Inter-basin transfers would continue (primarily the export of surface water from Jenny Creek Watershed). The State of Oregon and California would issue surface water and groundwater rights on private lands in accordance with State laws.
- Climate trends would continue and amplify (refer to Section 6.3, Climate Change).
- With climate change, snowpack would be reduced, potentially causing more variability in peakflows and lower base flows (Halofsky et al. 2022).
- Private lands within the CSNM boundary would continue to be managed as they are currently (logging on private forest land, agricultural clearing, and grazing).
- One site Potential Tree Height width Riparian Reserves would be of adequate width to protect hydrologic resources (wetlands, springs, streams, constructed reservoirs, ponds, and lakes) by precluding sediment transport from upland areas (Rashin et al. 2006) and providing stream-channel shade (Groom et al. 2003; Reeves et al. 2003).
- Hydroregions (physical classification of landscapes based on precipitation) include the following: Rogue Basin: rain dominated less than 2500 ft. elevation, rain-on-snow 2500 ft. to 5000 ft. elevation, snow dominated greater than 5000 ft. elevation. Klamath Basin: rain dominated less than 3000 ft. elevation, rain-on-snow 3000 ft. to 4000 ft. elevation, snow dominated greater than 4000 ft. elevation.
- Rain-on-snow hydro regions (and snow dominated hydro regions that transition to rain-on-snow dominated hydro regions from climate change) can exhibit a detectable change in peakflows in subwatersheds where greater than 20 percent of the forested acres have less than 30 percent canopy cover (Grant et al. 2008; USDI BLM 2016b).

- Aging and undersized stream crossings can have an increased risk of failure with increased peak flows (Gucinski et al. 2001; Halofsky et al. 2011; Halofsky et al. 2022**)**.
- A dense road network can intercept groundwater and exacerbate summer low flow conditions (Moore and Wondzell 2005).

Analysis Methodology and Techniques

For peakflows:

- Identify hydroregions within the sub-watersheds (6^{th} field HUCs) in the analysis area from existing BLM GIS data.
- On BLM-administered lands and non-BLM-administered lands within rain-on-snow and snow dominated watersheds, identify areas in early successional forest (canopy cover less than 30 percent and forest height less than 20 feet) using LiDAR and aerial photo imagery.
- For each rain-on-snow watershed and snow watershed, calculate the total acres of early successional forest for all ownerships as a percentage of the total forested acres in the watershed (total acres minus non-forest acres)

For peakflows and low flows:

- Identify perennial and intermittent stream/road crossings with hydrologic connectivity across all lands within the Monument.
- Determine road density and riparian road density (road miles/square mile) on BLM-administered lands and non-BLM administered lands, within each sub-watershed. Incorporate road density data as an influence on augmenting peakflows and low flows/interception of groundwater.

For low flows:

- Identify proposed vegetation treatments and determine if there is a positive or negative effect to low flows.
- Identify Riparian Areas with degraded conditions using BLM stream survey data and BLM and United States Geological Survey (USGS) road inventory data collected at stream crossings.

Units of Measure

- Acres of early successional forest in rain-on-snow and snow hydroregions
- Total forested acres in rain-on-snow and snow hydroregions
- Road density (road miles/square mile) in the analysis area.
- Miles of riparian exclosure (fencing) and changes to range management within active allotments.
- Acres of restored riparian area.

Relevant Data and Information to Be Used

- GIS-BLM corporate road information.
- BLM Stream survey data, qualitative and quantitative.
- National Hydrologic Database-BLM Corporate streams layer.

- Updated information on flow permanence from USGS data collection in summer 2023 and modeling using FlowPer.
- Road inventory/hydrology/stream crossing field data collection in RoadxStr project (summer 2023).
- Medford BLM road inventory data collected by hydrology staff (2008 to 2010).
- Oregon Water Resources Department- water rights database (surface and groundwater well records).
- 2016 SWO RMP corporate GIS data set for Western Oregon hydroregions.

Analytical Conclusions to Be Answered

- Determine the degree that management actions under each alternative influence the timing, duration, and magnitude of peakflows, maintenance of low flows, and water availability with expected changes to hydro regions from climate change.

Analysis Display

- Map of current hydroregions.
- Map of future hydroregions based on assumptions in recent research/modeling.
- Table of subwatersheds with high road densities.

5.7 LANDS WITH WILDERNESS CHARACTERISTICS

5.7.1 How would the alternatives affect BLM-administered lands outside of designated wilderness with identified wilderness characteristics?

Geographic Scale of Analysis

- Lands with wilderness characteristics within the decision area.

Relevant Assumptions

- Trends in demand for recreational use will continue into the foreseeable future.
- Wilderness characteristics would persist in areas that are protected for such characteristics.
- Management direction that would allow for surface disturbance, development, or that would enhance motorized recreation would adversely impact wilderness characteristics.

Analysis Methodology and Techniques

- Evaluate impacts to lands identified with wilderness characteristics. Each area identified as having wilderness characteristics will be evaluated on whether wilderness character elements (naturalness, size, and opportunities for solitude or primitive and unconfined recreation) would be maintained or not, based on the land allocation, management objectives, and management direction in each alternative.

Units of Measure

- Acres of lands with wilderness characteristics protected in the analysis area.

Relevant Data and Information to Be Used

- Inventory forms or background information for lands with wilderness characteristics.
- Geospatial data of lands with wilderness characteristics units.

Analytical Conclusions to Be Answered

- How management actions and allowable uses would affect wilderness character elements (naturalness, size, and opportunities for solitude or primitive and unconfined recreation) of lands with wilderness characteristics by alternative.
- Compare and rank from least to most the amount (acres) of protected lands with wilderness characteristics by alternative.

Analysis Display

- A map displaying lands with wilderness characteristics identified in the inventory.
- A table displaying lands with wilderness characteristics units and acreages.
- A table displaying acres of protected lands with wilderness characteristics by alternative.

5.8 LANDS AND REALTY

5.8.1 How would the alternatives affect opportunities for new land use authorizations and modification of existing land use authorizations in the planning area?

Background

- Applicable land use authorizations include permits, rights-of-way (ROWs), leases, and easements.
- Many of the existing land use authorizations in the CSNM are valid existing rights (see Section 6.10, Lands and Realty).

Geographic Scale of Analysis

- The planning area

Relevant Assumptions

- Future utilities would be co-located with existing utilities/disturbance within existing rights-of-ways where feasible; best management practices and/or mitigation measures (e.g., buried utilities) would be considered to address impacts to CSNM objects and values.
- Residential development adjacent to BLM-administered lands would continue to increase.

Analysis Methodology and Techniques

- Compare acres of BLM-administered lands within the planning area available, closed, or limited for land use authorizations by alternative.
- Compare acres and number of private parcels within the planning area that do not currently have documented valid existing access rights but could be granted access rights by alternative.

- Compare acres and number of private parcels within the planning area that do not currently have utilities to them for which rights-of-way could be granted by alternative.
- Compare acres and populations covered by communication site facilities including emergency services, radio communications, and cellular services by alternative.

Units of Measure

- Acres designated as either right-of-way exclusion or avoidance areas by alternative.
- Number of existing land use authorizations.
- Acres identified for potential acquisition.

Relevant Data and Information to Be Used

- Valid existing rights.
- Existing land use authorizations.
- Land ownership data.
- Private lands that do not hold valid existing rights.
- Identified public access needs.

Analytical Conclusions to Be Answered

- Total acres designated as either avoidance or exclusion area under the alternatives.
- Ranking of how the alternatives would affect BLM's ability to respond to the demand for future land authorizations.

Analysis Display

- Maps and tables

5.8.2 How would the alternatives affect public access, access for administrative purposes, and land tenure actions?

Background

- Applicable land use authorizations include permits, rights-of-way (ROWs), leases, and easements.
- Many of the existing land use authorizations in the CSNM are valid existing rights (see Section 6.10, Lands and Realty).

Geographic Scale of Analysis

- The planning area.

Relevant Assumptions

- Current market trends suggest that identifying willing sellers and willing landowners to provide access via easement acquisitions or purchases within the planning area is becoming increasingly difficult.

Analysis Methodology and Techniques

- Consider the checkerboard ownership, access issues, and access continuity.

Units of Measure

- Number of private inholdings.
- Acres of BLM-administered lands within the planning area which do not currently have public access.
- Acres of BLM-administered lands within the planning area which do not currently have administrative access.
- Land tenure status by alternative.

Relevant Data and Information to Be Used

- Land ownership data
- Identified public access needs.

Analytical Conclusions to Be Answered

- How would the alternatives affect access to private parcels and public access needs?
- Ranking of how the alternatives would affect BLM's ability to respond to the demand for future land authorizations.

Analysis Display

- Maps and tables

5.9 LIVESTOCK GRAZING

5.9.1 How would the alternatives affect the lands available for livestock grazing and forage availability and management practices on those lands?

Background

- For lands available for livestock grazing, the BLM will identify on an areawide basis both the amount of existing forage available for livestock (expressed in animal unit months or AUMs) and the future anticipated amount of forage available for livestock with full implementation of each alternative. When determining forage availability, the BLM factors in the following: maintaining a thriving natural ecological balance and multiple-use relationships (BLM H-1601-1, Land Use Planning Handbook, Appendix C, p. 14).
- Grazing management practices will be designed in a manner than protects CSNM objects and values, unless otherwise provided for in law (BLM Manual 6220, Section 1.6.I.2).
- As required by the Section 1402(a)(1) of the Omnibus Public Lands Management Act of 2009, the BLM will ensure a permanent end to livestock grazing on the grazing allotment covered by a donated grazing lease in the CSNM.
- As required by Section 1402(b) of the Omnibus Public Lands Management Act of 2009, the BLM will ensure a permanent end to livestock grazing in the Agate, Emigrant Creek, and Siskiyou allotments in and near the planning area.

Geographic and Temporal Scale of Analysis

- The decision area.

Relevant Assumptions

- If soil, vegetation, or other resources within a grazing allotment require immediate protection because of certain conditions resulting from disturbance events (e.g., drought or fire), or if continued grazing use poses an imminent likelihood of significant resource damage, the BLM would temporarily close allotments or portions of allotments to grazing or modify authorized grazing. Modifications could include reducing the number of livestock allowed to graze during the season of use or taking livestock off early (43 CFR 4110.3-2 and 4110.3-3(b)).
- If prescribed fire or wildfire removes substantial amounts of vegetation, it often takes two years or longer to successfully establish a new seeding, especially when establishing native plants (H-1742-1, Burned Area Emergency Stabilization and Rehabilitation Handbook, p. 36).

Analysis Methodology and Techniques

- Provide the total acres of BLM-administered lands allocated for livestock grazing in each alternative.
- Identify where vegetation management and prescribed fire would be allowed within grazing allotments by alternative and how many acres would be affected.
- Identify where habitat restoration would occur within grazing allotments.
- Identify variations in grazing management practices, such as grazing systems, range improvements, and changes in season of use and/or stocking rates for each allotment.

Units of Measure

- Acres available and unavailable for grazing by alternative.
- Acres of proposed prescribed fire or vegetation management and habitat restoration by alternative.

Relevant Data and Information to Be Used

- Number and size (acres) of current allotments that are administered by the BLM.
- Total leased or permitted AUMs by allotment.
- Types of allowable uses proposed by alternative.
- Acres of management areas by alternative.
- Existing range improvements within allotments.
- Assessment, Inventory, and Monitoring (AIM) data to be collected in summer 2023 and used in reference to ecological site descriptions.
- Rangeland Health Assessment data for the grazing allotments in the planning area (2001-2008).

Analytical Conclusions to be Answered

- Rank alternatives by the total acres of BLM-administered lands allocated for livestock grazing.
- Compare how management actions and other allowable uses would affect forage availability on lands available to grazing by alternative.

- Compare how grazing management practices would vary by alternative.

Analysis Display:

- Map of lands allocated for grazing in each alternative.
- Table or graph showing the change in acreage of BLM-administered lands allocated for grazing in each alternative.
- Table showing acres of proposed vegetation management, prescribed fire, and habitat restoration activities in each allotment by alternative.
- Table displaying the proposed grazing management practices in each allotment by alternative.

5.10 MINERALS

5.10.1 How would the alternatives affect mineral materials available for BLM administrative use?

Geographic Scale of Analysis

- The sixteen existing rock quarries within the decision area.

Relevant Assumptions

- Impacts would be limited to the previous disturbed existing quarry and/or adjacent to the previously disturbed area.
- The use of existing rock quarries to produce mineral materials would cause a predictable amount of impact to resources at the quarry site.
- Based on engineering estimates for BLM use, no more than two acres per decade for all quarry use is expected for new disturbance outside of the existing quarry area.
- Increased levels of constraints on quarries within the CSNM would generally result in reduced opportunities to acquire mineral materials.
- Increased levels of constraint on quarries within the CSNM would increase the cost of BLM administrative projects using mineral materials due to the cost of purchasing mineral materials and increased distances to transport the mineral materials (time and fuel) from outside the CSNM.

Analysis Methodology and Techniques

- Each of the 16 existing quarries in the Monument would be surveyed for the volume of mineral materials available for BLM administrative use.
- Develop a matrix of CSNM objects and values for each existing quarry to assess if resource conflicts are present.

Units of Measure

- The number of existing rock quarries and cubic yards of mineral material.
- Distance from CSNM project locations to quarries both outside and inside of the CSNM.
- Cost of operations based on quarry location and ownership.

Relevant Data and Information to Be Used

- Quarry sites and inventory data.
- Estimates of volume of mineral material available from previous drill investigations.
- Manuals on quarry reclamation and best management practices for quarry use.
- Resource data, including but not limited to, roads, recreation trends, trailheads, wildland firefighter safety zones, cultural, plant and wildlife.

Analytical Conclusions to Be Answered

- Based on the matrix, the BLM would determine which quarries would be available for mineral material extraction within the planning area.

Analysis Display

- The analysis will be displayed in a table and map that identifies the management of each quarry by alternative.

5.11 Native American Religious Concerns and Tribal Use

5.11.1 How would land management activities affect sacred sites, sites used for religious purposes, or other places of traditional cultural importance?

Background

- The BLM is planning to conduct a comprehensive cultural context study and develop a cultural resource management plan in close collaboration with affiliated Tribes following the RMP analysis with the aim of identifying and documenting places and uses of traditional religious or cultural importance, in addition to implementing best management practices to ensure their preservation for this and future generations.

Geographic Scale of Analysis

- The decision area.

Relevant Assumptions

- Landscapes of religious or cultural importance to Tribes are known, are identified in partnership with Tribal Nations, or can be inferred and can, where appropriate, be shown on a map in ways that protect the confidentiality of that information. A quantifiable analysis of the effects to all sites or landscapes of religious or cultural importance to Tribes is not possible without data on the location and traditional use of such areas, therefore the analysis will be qualitative.

Analysis Methodology and Techniques

- Analysis will include overlay of land use allocations under the alternatives, with areas of known or inferred traditional use and will also include qualitative analysis of management actions with types of traditional uses. Analysis will include overlay of management actions under the alternatives with known or inferred landscapes of religious or cultural importance to Tribes and local communities.

Units of Measure

- Traditional use areas of religious or cultural importance to Tribes subject to impacts from management alternatives and qualitative analysis of types of traditional use subject to impacts from management alternatives.
- Landscapes of religious or cultural importance to Tribal Nations and local communities subject to impacts from management alternatives

Relevant Data and Information to Be Used

- Relevant data includes spatial extent of management action alternatives and traditional use areas and a list of types of traditional use.
- Traditional Indigenous Knowledge regarding traditional use resources and areas as derived from ethnographic studies and consultation with Tribes.
- Data and information regarding cultural resources, as well as suggested management goals and objectives specific to cultural resources, in the decision area.

Analytical Conclusions to Be Answered

- How management alternatives would impact traditional use areas of religious or cultural importance to Tribes.

Analysis Display

- Narrative description of known or inferred locations anticipated to be impacted by management alternatives, as appropriate and in accordance with applicable law. Describe anticipated impacts to those locations of traditional use.
- Number of known locations anticipated to be impacted by management alternatives displayed in tabular format.

5.11.2 How would land management activities affect Tribal plant collection, management, and use?

Background

- The number of culturally important plants within the decision area is unknown and the BLM does not have data on current Tribal access to and use of culturally significant plants.
- The BLM uses consultation with Tribes to better understand the plant resources they are using and the location of gathering areas at the implementation-level.
- The BLM is planning to conduct a comprehensive cultural context study and develop a cultural resource management plan in close collaboration with affiliated Tribes following RMP analysis with the aim of identifying and documenting traditional places and uses, in addition to implementing best management practices to ensure their preservation for this and future generations.

Geographic Scale of Analysis

- The decision area.

Relevant Assumptions

- Culturally significant plants have the potential to be impacted in a number of ways including removal of plant habitat, removal of access to plant patches, and herbicidal spraying.
- When Tribes share lists of plant species that they use and have asked BLM to manage plant patches appropriately for tribal use.
- A quantifiable analysis of the effects on plant collection and use is not possible without data on plant locations. Therefore, effects would be discussed qualitatively.

Analysis Methodology and Techniques

- Overlay where proposed management actions and allowable use areas (recreation, grazing, vegetation treatments, etc.) under the alternatives, with areas of known or inferred plant collection or culturally significant plant patches to determine the level of potential effect to such areas. Provide a qualitative analysis of management actions with those areas and types of culturally significant plants known to exist.

Units of Measure

- Traditional gathering areas or areas of culturally significant plant patches subject to impact from management alternatives.

Relevant Data and Information to Be Used

- Traditional Indigenous Knowledge regarding traditional resources and areas as derived from ethnographic studies and consultation with Indian Tribes.

Analytical Conclusions to Be Answered

- How management alternatives would impact traditional use areas or culturally significant plant patches.

Analysis Display

- The results of analysis would be explained in text.

5.12 INVASIVE, NONNATIVE PLANTS AND NOXIOUS WEEDS

5.12.1 How would the alternatives prevent the introduction and spread of invasive, nonnative plants and noxious weeds?

Geographic Scale of Analysis

- The decision area.

Relevant Assumptions

- Preventing the establishment of new populations of noxious weeds and invasive nonnatives is the priority, followed by early detection and rapid response of new occurrences, and lastly is the treatment or containment of a widespread infestation.
- Noxious weeds and invasive, nonnative plants are more likely to become established and spread in areas where the ground surface has been recently disturbed.

- Activities such as recreation, the use of motorized vehicles, and livestock grazing continue to introduce noxious weeds and invasive, nonnative plants into the planning area.
- Noxious weeds and invasive, nonnative plants tend to become established along developed roads, trails, and rights-of way corridors; at recreational destinations; at livestock developments; and in other congregation areas.
- Invasive plants are not thoroughly mapped throughout the planning area and databases are likely underrepresenting the true area of invasive species, especially invasive annual grasses and non-native species that are not commonly considered invasive but could become invasive with climate impacts.

Analysis Methodology and Techniques

- Use Manual 9105, Invasive Risk Assessment and Rating Process, for analysis.
- Analyze the effects of management activities on the establishment and spread of noxious weeds and invasive, nonnative plants.
- Compare which alternatives would have the greatest impacts on noxious and invasive plant species' establishment and spread based on acres or miles and mechanical disturbance.

Units of Measure

- Counts of the occurrences of noxious weeds and invasive, nonnative plants.
- Acres and/or miles of existing infestation by taxon.
- Acres and/or miles of potential infestation by taxon by used, such as livestock grazing.

Relevant Data and Information to Be Used

- Spatial and attribute data for existing occurrences of noxious weeds and invasive, nonnative plants from VMAP, Consortium of Pacific Northwest Herbaria, Weedmapper, Oregon Flora Project, and any sources relevant to CA.
- Modeling for existing invasive and nonnative species spread.
- Modeling for new invasive and nonnative species invasions and potential spread.

Analytical Conclusions to Be Answered

- Compare the impacts of each alternative on the establishment and spread of invasive plant species. Draw conclusions about which alternatives would likely result in the greatest and least invasive plant species' establishment and spread in the planning area.

Analysis Display

- Summary tables of acres and/or miles of road available to management uses of soil disturbing activity, heavy equipment use, livestock grazing, and recreation by alternative.

5.13 RECREATIONAL USE AND VISITOR SERVICES

5.13.1 How would the proposed management alternatives affect the BLM's ability to provide recreation opportunities and infrastructure?

Geographic Scale of Analysis

- The decision area.

Relevant Assumptions

- Trends in recreational demands, as indicated by visitor use, would continue to increase.
- Changing access to BLM-administered lands may increase recreational demand in some areas, while decreasing demand in other areas by dispersing recreation throughout the analysis area.

Analysis Methodology and Techniques

- Follow direction in BLM H-8320-1, Planning for Recreation Services to:
  1) Designate recreation management areas (RMAs). This would include identifying existing RMAs and the rationale for adding, dropping, or changing RMAs.
  2) Establishing Recreation and Visitor Services objectives for each RMA. The objectives would define the specific recreation opportunities, such as the activities, experiences, and benefits derived from those experiences that would be the focus of management.
  3) Identify management actions and allowable uses for each RMA. These actions support RMA objectives and include maintaining or enhancing the recreation setting characteristics and addressing visitor health and safety, resource protection, and use and user conflicts.
- Quantitatively compare acres of RMAs and recreational opportunities between alternatives.

Units of Measure

- Acres and types of RMAs.
- Type and quantity of recreational opportunities.

Relevant Data and Information to Be Used

- GIS data of land use polygons for recreation management areas, including acres of existing areas and those areas proposed under each alternative.
- Information on existing recreation opportunities within the decision area for recreation service providers other than the BLM.
- Road and trail networks for areas where designated travel for recreation (such as off-highway vehicle [OHV], snowmobile, and mountain bike) use is occurring.
- Recreation planning issues and management concerns such as user demand, use/user conflict, visitor health and safety, and resource protection.
- Information on recreation planning issues and user demand gathered from public scoping and stakeholder engagement.

Analytical Conclusions to Be Answered

- The effects on recreation management areas, permits, and types of allowable recreation use by alternative.

Analysis Display

- Use tables and maps to present existing and proposed RMAs for the areas listed above in *Relevant Data and Information to Be Used*.
- A comparative narrative discussion on how proposed management direction in each alternative would affect the BLM's ability to provide recreation opportunities and infrastructure.

5.14 Social and Economic Values and Environmental Justice

5.14.1 What social and economic values are tied to specific resource management considerations (e.g., recreation and tourism, grazing management, communication site and transmission line leases, forest management) and how would these values and uses be affected by changes in management? How would low-income, minority, and Tribal populations be affected by changes in management, and would any identified populations be negatively or adversely affected?

Geographic Scale of Analysis

- Jackson and Klamath counties in Oregon and Siskiyou County in California. While some of the impacts of CSNM management are anticipated to extend beyond these counties, they are where most of the social and economic impacts of concern would take place, and where there is the greatest potential for effects on environmental justice (low income, minority, and Tribal) populations.

Relevant Assumptions

- The Situation Assessment Report (The Langdon Group 2023) describes many of the social and economic values tied to the CSNM and its management. Social and economic effects would depend on how changes in resource outputs and opportunities affect these values and the meaning of those changes to people and communities.
- The Situation Assessment Report (The Langdon Group 2023) also describes the many perspectives people have on the BLM's communication strategies and engagement with the public. Communication and engagement are another type of social value that would affect how people evaluate the alternatives.
- Some of the social and economic effects may be due to changes in non-market resource values and uses, such as improved wildlife habitat or air quality, which are valued by people but are not bought and sold in market economies.

Analysis Methodology and Techniques

- Follow the process described in the Desk Guide: Socioeconomic Aspects of Planning and NEPA, updated March 2023 (available at: https://doimspp.sharepoint.com/sites/blm-hq-210-socioeconomics/SitePages/Commonly-Used-Tools-and-Data-Sources.aspx).

- **Step 1**: Identify values and populations likely to be affected by alternatives, based on the socioeconomics-related issues. Values are a measure of the benefits people perceive from their environment.
    - This step is done by reviewing the alternatives and connecting each alternative to potential changes in values. The socioeconomic analysis connects the various biophysical impacts to each other and to socioeconomic consequences.
    - Some of these values would be the same ones identified in other resource analyses. For example, effects on Native American values would be summarized from the Cultural Impacts section rather than analyzed independently.
    - The other primary values analyzed would be effects on quality of life for local and area residents, effects on the local and regional economy, and effects on visitors and others who care about resources and opportunities protected by the Monument.
    - Effects on quality of life can be positive or negative and stem from actions such as changes in grazing availability, access to recreational opportunities, improvements in recreation access or facilities, and others.
    - Effects on local and regional economies can come from increased or decreased access to CSNM resources and lands and changes in existing economic uses or provision of new or improved economic opportunities.
    - Effects on the visitors result from increases or decreases in access and other aspects of the quality of the experience, as determined by the Recreation analyses. Any such changes also feed into the economic analysis.
    - Local residents, visitors, and other members of the public who care about CSNM resources also can be affected by changes in ecosystem conditions and functions, as measured by biophysical analyses.
- **Step 2**: Once the above links are established, analyze social and economic effects by identifying any significant or meaningful effects on values that stem from changes in resource outputs and opportunities.
    - The methods used would depend on the issue being analyzed.
    - The analyses would be qualitative in most cases because the data from other resource analyses would not be sufficient to permit quantitative analysis. For example, the analysis does not intend to incorporate an economic input-output model that predicts the employment, income, and total economic output resulting from each alternative (i.e., an IMPLAN method).
    - This step would use public comments, existing social and economic conditions and trends, BLM policy and guidance, and other sources such as vision statements contained in county plans.
    - Effects would be compared to the no-action alternatives as well as to those stemming from other management alternatives.
    - The result is a qualitative summary, by alternative, of the meaningful differences in quality of life, economic opportunity, and effects on visitors and the public concerned about Monument resources and opportunities.
- **Step 3**. Conduct the environmental justice analysis.

- This is done first by assessing whether any of the effects identified in Step 2, especially if negative, would fall disproportionately on low-income, minority, or Native American populations.
- Second, the analysis identifies impacts that may not affect general populations but may affect one or more environmental justice populations due to their vulnerability or unique use of resources.
- This analysis relies heavily on the impact analyses from other resource areas as well as public comments and other sources of information that link environmental justice populations to resource uses and values—perhaps via pathways that do not exist for or are less prevalent in general populations.
- This analysis is also qualitative and is subject to change based on comments received from the relevant populations.

Units of Measure

- The units of measure would depend primarily on those used by the relevant resource areas. Environmental justice effects would be based on the identified populations.

Relevant Data and Information to Be Used

- Data from the other resource analyses (i.e., anticipated changes in the condition, quality, availability, or use of those resources).
- Existing data on county demographics and economies, including identification of environmental justice populations.
- Literature describing likely social and economic effects of proposed changes in management of BLM-administered lands due to the CSNM expansion.

Analytical Conclusions to Be Answered

- Alternatives would be compared, discussing the net effects on local economies and quality of life that would result from implementing the alternatives' management actions and allowable uses.

Analysis Display

- The analysis would be presented through qualitative analysis and text. If useful, a summary table showing the predominant type and level of effect on social and economic values would be included.

5.15 SOIL RESOURCES

5.15.1 How would the alternatives affect fragile soil types?

Background

- Soils are classified as fragile according to the BLM's Timber Production Capability Classification Manual (BLM Manual 5251). This classification system considers soil texture, vegetative cover, and multiple other soil properties. Another definition of fragile from the Natural Resources Conservation Service (NRCS), provided in the Web Soil Survey published by the USDA NRCS at http://websoilsurvey.nrcs.usda.gov/, may also

be used as a less timber-production-focused definition, though the maps are typically not produced at a fine enough scale for use in managing specific forest stands.

- The goal in identifying fragile soils is to determine where additional protections to soil resources would be needed to avoid unacceptable levels of erosion, or losses to soil productivity.

Geographic Scale of Analysis

- Lands in the decision area not covered by a waterbody or exposed bedrock.

Relevant Assumptions

- Ground disturbing forest management actions such as pile burning, or mechanical thinning negatively affect the ability of fragile soils to remain productive and healthy.
- Those negative effects can be reduced or eliminated with the incorporation of Best Management Practices designed to comply with the Clean Water Act.

Analysis Methodology and Techniques

- Overlay various maps of fragile soil with maps of proposed management actions.
- Evaluate which fragile soil classifications would need adjustments to management actions using research studies and evaluating which best management practices have been most effective in past practices throughout the district from the Clean Water Act (33 U.S.C. 1251, et seq.)

Units of Measure

- Acres of fragile or highly erodible soil currently within the analysis area.
- Acres of fragile or highly erodible soil projected to be impacted by management actions.

Relevant Data and Information to Be Used

- Maps of soil types derived from USDA NRCS Soil Survey information (USDA 2019).
- Maps or reports of surface disturbances from natural or human sources.
- BLM's Timber Production Capability Classification system.

Analytical Conclusions to Be Answered

- Locations of fragile and highly erodible soils in need of special protection or restoration.
- Acres of fragile/highly erodible soil potentially impacted by proposed management actions.
- Expected impacts based on acreages of fragile soil and past impacts from management actions.

Analysis Display

- Maps delineating the current extent of mapped fragile/highly erodible soils.
- Acres or soil affected by action type.

5.15.2 How would the alternatives affect soil productivity and health?

Geographic Scale of Analysis

- Lands in the decision area not covered by a waterbody or exposed bedrock.

Relevant Assumptions

- Proposed actions would cause a predictable amount of impact based on the type of action.
- Actions that would cause disturbances measurable by the Forest Soil Disturbance Monitoring Protocol include but are not limited to broadcast burning, pile burning, all yarding of commercial sized trees, temporary road construction, and unauthorized OHV use.
- Effects from these actions to soil resources monitored by the Forest Soil Disturbance Monitoring Protocol include soil burn severity, erosion, compaction, rutting/gulling, forest floor disturbances, topsoil mixing, and soil structural impacts.
- Rangeland soil impacts would be monitored periodically using Rangeland Health Assessments.

Analysis Methodology and Techniques

- Measure the impacts of forest management actions using the Forest Soil Disturbance Monitoring Protocol (Page-Dumroese et al. 2009) for forest soils, which considers detrimental disturbance as an impact of a soil to grow native vegetation.
- Multiply the acres of anticipated disturbance by acres of proposed actions to obtain the anticipated acreages of disturbance by action.

Units of Measure

- Acres of detrimental soil disturbance.
- Acres of grazing habitat and the intensity of use.
- Miles of roads.

Relevant Data and Information to Be Used

- Maps of soil types derived from USDA NRCS Soil Survey information (USDA 2019).
- Maps or reports of surface disturbances from natural or human sources.
- Reports on efficacy of various management practices and actions.

Analytical Conclusions to Be Answered

- How various management actions would affect the productivity of the soil and the acreages of each proposed action.

Analysis Display

- Graphs depicting impact to soil resource separated by action (i.e., broadcast burning causes this many acres of this level of disturbance).

5.16 SPECIAL STATUS PLANTS

5.16.1 How would management activities (fuels reduction treatments, recreation, and grazing) allowable in each alternative affect special status plants, bryophyte, & fungi species?

Background

- The BLM has surveyed only a portion of BLM-administered lands within the decision area, and most surveys are associated with previously planned projects (such as past timber sales/fuel reduction).
- BLM special status species include federally listed, proposed, and candidate species, and BLM Sensitive species. The list of special status species changes periodically because of new information (e.g., newly described species, new species records for Oregon, new documented locations of species, and newly described threats to species).
- Bureau Sensitive plant, bryophyte, and fungi species are not evenly distributed across the landscape. Some species are specialists and associated with a discrete habitat feature or plant community. Other species have wider amplitude and occur in different plant communities or on different substrates. Even when apparently good potential habitat exists, botanists cannot predict that they will find new sites. Therefore, it is not possible to model or predict where a particular species may or may not occur, and it is difficult to quantify impacts to such a large number of species.
- Special status species hot spots occur in western Oregon in regions reflecting floristic diversity and habitat quality. Hot spots can occur at fine spatial scales, such as special habitat features (e.g., meadows, wetlands, rock outcrops, and other non-forested areas), and at larger geographic scales where high levels of endemism occur on the broader landscape level.

Geographic Scale of Analysis

- The decision area.

Analytical Assumptions

- Types of proposed actions most likely to affect special status plant species include fuels treatment, livestock grazing, and motorized recreation.
- Most special status species sites are small and management actions to preserve or enhance them are compatible with project objectives. However, indirect impacts, such as the introduction of non-native species could have long-term impacts on the viability of special status species sites.
- Some special status species (such as Gentner's fritillary) are adapted to frequent natural disturbances, whereas other species are adapted to long periods of stable habitat conditions (many of the special status fungi species). Natural disturbances affect species differently and may create a positive or negative habitat change depending on the type, intensity, and frequency of the disturbances.
- For vascular species, site data in the BLM regional database (Geographic Biotic Observations [GeoBOB]) is likely to overstate the actual number of occurrences and individuals per population due to the historical age of the data and lack of revisits to the

occurrences Conversely, this database may under-represent occurrences of non-vascular and fungi species because these organisms are difficult to count and map.

- At this planning scale, it is not possible to forecast the location and timing of specific management activities that would affect plant, bryophyte, and fungi habitat. Therefore, the analysis of impacts to special status species would look at the relative difference in management activity levels in fuels, recreation, and grazing between alternatives.

Analysis Methodology and Techniques

- There are currently 31 special status species known to occur in the decision area. Because there are too many species to evaluate individually, the BLM would group species based upon their associated habitat features for analysis (i.e., a functional group). Some species are associated with a specific plant series or ecological feature while others have a broader range of associated habitats. Therefore, some species may occur in more than one functional group.
- Sort the special status plant and fungi species into functional groups based upon their associated habitat requirements Species would be sorted into functional groups or guilds. Use these functional groups to discuss potential impacts.
- The analysis would focus on species within specific areas proposed for fuels treatment, livestock grazing, and motorized recreation, or other habitat-disturbing activities The invasive species effects analysis would provide the basis for assessing the indirect effects of habitat disturbing actions.
- Review current Geographic Biological Observations tabular data for special status species occurrences, population data, habitat data, and area inventoried Use spatial data from this database to analyze species distribution and density.
- Review survey data available in the Geographic Biological Observations database and from the districts and compare acres surveyed to the number of documented sites Determine the number of new sites found in each general habitat type. This information would be used to estimate the number of new sites that surveyors may find with additional project-level surveys.
- Describe the relative degree of change to special status species habitats and functional groups by alternative.

Units of Measure

- Species number of occurrences, population size, and location of occurrence.

Relevant Data and Information to be Used

- Spatial and attribute data for special status species - number of occurrences, population size, and location of occurrence.
- *Fritillaria* Management Area
- Data sources include: the BLM Geographic Biological Observations database, Oregon Natural Heritage database, Oregon Flora Project (OSU 2023), Jepson Manual of Vascular Plants of California (Baldwin et al. 2012), Consortium of Pacific Northwest Herbaria, Recovery Plan for *Fritillaria gentneri*, and individual species fact sheets and conservation strategies available through the Interagency Special Status/Sensitive Species Program (USDA/USDI 2021).

Analytical Conclusions to Be Answered

- Describe the habitat characteristics modified by each proposed activity.
- Describe the anticipated impacts from proposed activities to functional groups.

Analysis Display

- Table showing a list of special status species and each corresponding functional group.
- Table showing the relative effect of each alternative on species functional groups.
- Table showing rare plant communities and relative change by alternative.

5.17 TERRESTRIAL WILDLIFE

5.17.1 How would the alternatives affect terrestrial wildlife habitat?

Background

- The 2008 CSNM RMP adhered to the Survey and Manage provisions from the 1995 Medford District ROD/RMP (USDI BLM 1995a). The provisions were created to mitigate for possible inadequate protection within the scope of large-scale commercial timber harvest in matrix land use allocations of species either known or suspected to be associated with late successional forests and which were either known to be rare across their range or for which inadequate population information was available.
- Survey and Manage provisions will not be carried forward under any action alternatives in this document as large-scale commercial timber harvest would not be considered within the decision area.
- Analysis of effects to terrestrial wildlife habitat would include:
    - Raptor nesting areas
    - Migratory bird habitat
    - Great gray owl habitat
    - Peregrine falcon habitat
    - Northern spotted owl habitat
    - Deer and elk migration and movement corridors
    - Elk calving and wintering areas
    - Fisher denning and resting habitat
    - Western pond turtle habitat
    - Oregon spotted frog habitat

Geographic Scale of Analysis

- The decision area.

Relevant Assumptions

- Climate trends would continue and amplify (see Section 6.4).
- Adjacent non-federal lands would continue to be managed as they are currently: (e.g., private forest lands would continue to be cut on a predictable rotation, rangelands would continue to be grazed).

- Climate-related changes may affect food, cover, and nest site availability for many wildlife species (e.g. loss of wetland habitat reducing suitable forage and dam materials for beaver, loss of foraging locations for peregrine falcons, loss of breeding habitat for amphibians) (Halofsky et al. 2018).
- Climate-related changes to abiotic features such as precipitation regimes and temperature fluctuation patterns may affect phenology in wildlife species and in the plant communities upon which they depend (Halofsky et al. 2018).

Analysis Methodology and Techniques

- Habitat for special status species and a subset of species selected to represent those identified in the proclamation would be overlaid with land use allocations to determine areas of potential impacts on these species. Effects would be determined based on anticipated alteration of habitat structure and spatial distribution as a result of actions proposed under the overarching guidance of this planning document.

Units of Measure

- Degree of modification to habitats, including within Critical Habitat.

Relevant Data and Information to be Used

- Designated Critical Habitat
- Documented species location data
- Designated management areas

Analytical Conclusions to be Answered

- How proposed management actions/objectives and allowable uses would impact wildlife species and their habitat.

Analysis Display

- Table displaying acres of habitat overlapping management areas that may impact wildlife.

5.17.2 How would management under the alternatives affect wildlife habitat connectivity?

Geographic Scale of Analysis

- The decision area.

Relevant Assumptions

- Management actions on BLM-administered lands that remove or alter habitat may reduce habitat connectivity for some wildlife species.
- Climate-related mortality of vegetation may interrupt connectivity important to persistence of some wildlife species (Halofsky et al. 2018).
- Loss of riparian forest habitat brought about by climate-related hydrologic changes may result in a loss of connectivity corridors and habitat for some wildlife species (e.g., bats, woodpeckers, and migratory passerine species) (Halofsky et al. 2018).

Analysis Methodology and Techniques

- Use remote sensing data, historic species location information, and habitat models (as available) to identify existing habitat connectivity corridors.
- Use fire and pathogen mortality in the decision area to evaluate how much habitat (by type) has been lost from mortality.
- Identify where management actions and allowable uses would alter habitat characteristics.

Units of Measure

- Changes in acres of habitat types and characteristics.

Relevant Data and Information to be Used

- Wildlife connectivity maps developed by ODFW (2023).
- Documented species location data.
- Habitat/Vegetation data.
- Burned area maps and post-fire vegetation data.
- Forest pathogen mortality data.

Analytical Conclusions to be Answered

- Compare how much the management actions/objectives would affect protection and restoration of wildlife habitat connectivity by alternative.

Analysis Display

- Table of acres of habitat by management area.
- Maps displaying habitat connectivity corridors for select species by habitat association.

5.18 VEGETATION - FORESTED LANDS

5.18.1 How would the alternatives affect stand level composition, density, stand structure and forest successional stages?

Background

- Fire suppression has dramatically altered current forest characteristics from their historic levels which has left these forests more vulnerable to disturbance than they were in the past (Bennet et al. 2023; Hessburg et al. 2000; Hessburg et al. 2005; Hessburg et al. 2015; Haugo et al. 2015; Laughlin et al. 2023; Stine et al. 2014).
- Ecological-based forest restoration can help to mitigate damage from disturbance, but it must be approached at both the stand-level and landscape-level in order to be effective.

Geographic Scale of Analysis

- The forested lands in the decision area.

Relevant Assumptions

- The effects of disturbance (insects and disease, drought-based mortality, density dependent mortality) can be mitigated by managing and maintaining forest stands within a desired range of conditions specific to that forest type (Haugo et al. 2015).
- Restoring forests to something closer to historic species composition will boost both stand level resistance and landscape level resilience (Haugo et al. 2015; Hessburg et al. 2015).
- Lowering stand densities to reduce density dependent stress and increase tree vigor would reduce damage from disturbance (Halofsky et al. 2016; Haugo et al. 2015).
- Addressing variables such as stand density, composition, stand structure and forest successional stage would address smaller scale stand level resistance to disturbance.
- Modeling variables would be constant in all alternatives, so variation in resulting stand metrics would only be based on differences in ecological-based forest restoration treatments (treatments) for each alternative and would provide a comparison between alternatives.

Analysis Methodology and Techniques

- Forest stands would be stratified based on current forest conditions according to Light Detection and Ranging (LiDAR) and Gradient Nearest Neighbor (GNN) data.
- Those strata would be associated with treelists from Current Vegetation Survey plots across the analysis area.
- ORGANON would be used to model Current Vegetation Survey plot growth for forest health and stand structure for each of the alternatives.

Units of Measure

- As Simpson (2007) notes, "Growth Basal Area was developed by Hall (1987, 1989) as an index of stand stockability (i.e., the proportion of a given area capable of holding and growing trees). Stockability is directly affected by inter-tree competition. Growth basal area uses tree diameter growth as an indirect measure of inter-tree competition." Growth basal area is used as a density measurement for multispecies stands in specific Plant Association Groups (PAGs) similar to those found in the analysis area. Growth basal area would serve as a target range of basal area measurements for forest types in the analysis area following treatments prescribed by the alternatives.
- Comparison of other metrics such as density dependent mortality, stand density index (SDI), relative density (RD), and Curtis' RD may also be used for comparison between the alternatives.
- Forest stand composition would be presented using changes in trees per acre of species in desired size classes retained.
- Spatial configuration of forest types would be described using acres (or percentage of acres) of forest stands restored to a desired range based on natural range of variability (NRV).
- While NRV may not account for changes due to climate change (Haugo et al. 2015) and may not be useful as a target, it is useful as a guide (Stine et al. 2014) to the conditions under which forests would be most resistant and resilient to disturbance.

- Forest successional stages would be described using the acres (or percentage of acres) of stands in each successional/structure class (s-class) as taken from Haugo et al. (2015).

Relevant Data and Information to Be Used

- Current Vegetation Survey plot data
- GNN
- LiDAR

Analytical Conclusions to Be Answered

- How treatments proposed in each alternative affect current and future stand-level composition, density, stand structure, and forest successional stages of forest stands.

Analysis Display

- Tables and maps

5.18.2 How would the alternatives contribute to a resilient distribution of structural classes and forest stand types?

Geographic Scale of Analysis

- The geographic scale is forested lands in the decision area.

Relevant Assumptions

- Restoring forests to something closer to historic species composition increases both stand-level resistance and landscape-level resilience (Haugo et al. 2015; Hessburg et al. 2015).
- Landscape-level resilience depends on maintaining heterogenous patches of forest stands across the landscape (Haugo et al. 2015; Hessburg et al. 2015; Laughlin et. al. 2023).
- Designing a restoration strategy that addresses the spatial configuration of stands in relation to each other.
- Modeling variables would be constant across the alternatives, so variation in resulting stand metrics would be based on differences in treatments for each alternative and would provide a comparison between alternatives.
- While NRV may not account for changes due to climate change (Haugo et al. 2015) and may not be useful as a target, it is useful as a guide (Stine et al. 2014) to the conditions under which forests would be most resistant and resilient to disturbance.

Analysis Methodology and Techniques

- Forest stands would be stratified based on current forest conditions according to Light Detection and Ranging (LiDAR) and Gradient Nearest Neighbor (GNN) data.
- GIS analysis of stand locations and treatment priorities would illustrate the spatial configuration of forests stands in relation to other aspects of topography, aspect and desired location.
- Comparison of landscape level resiliency for the alternatives would involve looking at conclusions from section 5.19.1 and the spatial configurations forecasted by the GIS analysis.

Units of Measure

- Spatial configuration would be presented as acres (or percentage) of acres restored to NRV for each alternative. Spatial modeling (GIS) would be used to show how forest stands in each alternative would fall in relation to each other.
- Analysis of landscape level resilience would be a comparative ranking of the alternatives in numerical order of resilience.

Relevant Data and Information to Be Used

- Current Vegetation Survey plot data
- GNN
- LIDAR

Analytical Conclusions to Be Answered

- How spatial configuration of forest stands, and subsequent landscape level resilience would be affected by the alternatives.

Analysis Display

- Tables and maps

5.19 VEGETATION – WOODLANDS, SHRUBLANDS, GRASSLANDS, AND WETLANDS

5.19.1 How would the alternatives affect the composition, connectivity, integrity, and resiliency of non-forested vegetation/habitats in the planning area?

5.20 VISUAL RESOURCES

5.20.1 How would the alternatives affect scenic quality on BLM-administered lands in the planning area?

Background

- Visual design considerations to minimize visual contrast and to protect the scenic quality would be incorporated into all surface-disturbing projects regardless of size, potential impact, or visual resource management (VRM) class.

Geographic Scale of Analysis

- The decision area.

Relevant Assumptions

- VRM class allocations allow for varying degrees of surface disturbance and change to the characteristic landscape which affects scenic quality.
- The construction of residential, commercial, recreational, and utility infrastructure near the analysis area would continue.
- Trends in drought and wildfires that affect vegetation and surface water would continue.

Analysis Methodology and Techniques

- Compare the effects on scenic quality resulting from different VRM class allocations, which allow for varying levels of modification to the characteristic landscape, by alternative.

Units of Measure

- Acres of proposed VRM class objectives under each alternative.

Relevant Data and Information to Be Used

- CSNM visual resource inventory (VRI), including scenic quality.
- CSNM VRM class allocations by alternative.

Analytical Conclusions to Be Answered

- Ranking of alternatives showing effects between visual resource inventoried acres and visual resource management acres. Additionally, for scenic quality, the scenic quality scores (A, B, or C) compared with the VRM class allocations across alternatives would identify areas and acres of protection levels provided by each alternative. The management of other resources and discretionary uses, and how those might affect scenic quality, would also be examined, and explained in a narrative format.

Analysis Display

- Tables and maps would be used to display the scenic quality ratings and the proposed VRM classes across the range of RMP alternatives.

5.21 WILD AND SCENIC RIVERS

5.21.1 How would the alternatives affect the free-flowing condition, water quality, identified outstandingly remarkable values, and tentative classification of suitable Wild and Scenic River segments?

Geographic Scale of Analysis

- The analysis area for suitable wild and scenic rivers (WSRs) is a river corridor extending, on average, one-quarter mile from both sides of the high-water mark, in the decision area.

Relevant Assumptions

- Trends in demand for recreational use would continue.
- Elements of eligible and suitable WSRs, including free-flowing condition, water quality, and ORVs, would persist in river corridors that are protected for such elements.
- Management direction that would allow for surface disturbance or development, or that would enhance motorized recreation in river corridors, would adversely affect WSR eligibility and suitability elements.

Analysis Methodology and Techniques

- Identify all eligible rivers segments on BLM-administered lands in the planning area. Eligible river segments must be free-flowing and have at least one outstandingly remarkable value (ORV).

- Assign a tentative classification to eligible river segments (wild, scenic, or recreational).
- To determine suitability, each river segment identified as being eligible under the Wild and Scenic Rivers Act (WSRA) would be evaluated whether eligibility elements (free-flowing, water quality for wild classification, and at least one ORV) would be maintained or not based on land allocation, management objectives, and management direction in each alternative.

Units of Measure

- Miles of rivers segments that have been identified as suitable under the WSRA protected.

Relevant Data and Information to Be Used

- GIS data for eligible river segments in the decision area.
- Miles of eligible river segments and tentative classification (wild, scenic, or recreational).
- GIS data of eligible river segments with overlapping acreages of other land use allocations for each alternative.
- Stand-alone Wild and Scenic River Eligibility report for all rivers and river segments within the decision area.

Analytical Conclusions to Be Answered

- How management actions and allowable uses across the range of alternatives would affect the suitability of river segment elements (free-flowing, water quality, and ORVs).
- For each alternative, miles of protected river segments that have been identified as suitable under the WSRA would be compared and ranked from most to least.

Analysis Display

- Map displaying eligible river segments that have been identified as suitable.

5.22 WILDLAND FIRE AND FUELS MANAGEMENT

5.22.1 How would the alternatives affect wildfire risk to Highly Valued Resources and Assets (i.e., monument objects and wildland urban interface)?

Background

- Wildland fire risk describes the likelihood of wildfire, intensity of wildfire (i.e., hazard), and susceptibility of human values (e.g., communities, homes, infrastructure, resources, etc.). There are two general strategies for treatments intended to modify landscape-level fire growth and behavior, and thus reduce landscape wildfire risk: 1) linear fuel breaks intended to aid in fire containment and limit fire size or acres burned (Agee et al. 2000; Weatherspoon 1996); and 2) area-based treatments that modify fire behavior (Finney 2001).
- Fire hazard refers to the ease of ignition, potential fire behavior (surface, passive, or crown fire), and resistance to control of wildland fuels (i.e., surface, ladder, and canopy fuels), which directly influences suppression tactics, for example, crown fires present the greatest resistance to control. The primary wildland fuel characteristics associated with

potential fire behavior and crown fire potential are canopy base height, canopy bulk density, and surface fuel loading (Jain and Graham 2007; Scott and Reinhardt 2001).

Geographic Scale of Analysis

- The decision area

Relevant Assumptions

- Expected fire behavior (surface, passive, or crown fire), estimated at 90th percentile fire weather conditions, would serve as a surrogate for fire hazard, where surface fire equates to low-hazard; passive fire equates to moderate hazard; and crown fire equates to high hazard.
- LANDFIRE (2020) fuel data is representative of wildland fuel profile within the planning area for the current condition.
- Surface fuels (represented by Fire Behavior Surface Fuel Models (Scott and Burgan 2005) and canopy base height impacts would be based on outcomes indicated by local monitoring data (e.g., USDI BLM 2021b), literature, assumptions in the Rogue Basin Strategy for post-treatment fuel transitions (Metlen et al. 2017; Metlen et al. 2021), LANDFIRE post-disturbance rules, and professional local knowledge.
- Canopy fuels impacts (canopy cover and canopy bulk density) would be based on vegetation model results (see Forest vegetation methods 5.19).
- Strategically placed proactive treatments across at least 10 percent of the landscape, at an optimal rate of one to two percent of the landscape per year would be effective at reducing potential wildfire severity (Finney 2007).
- The BLM assumes locally developed Potential (wildland fire) Operational Delineation boundaries, as described by Thompson et al. (2016) and Stratton (2020), represent the extent of the strategic "linear feature" fuel break strategy.
- Optimal landscape treatment for reducing fire risk is approximately 20-40 percent (Tubbesing et al. 2019; Salis et al. 2016; Metlen et al. 2017; Finney 2001). The BLM assumes this threshold applies to the "area based" wildfire risk reduction strategy. The BLM assumes the local area-based extent is represented by a focused component of the WUI (CWPP 2019), a ¼ mile buffer around Communities at Risk. The BLM assumes additional treatments beyond 40 percent have been shown to have little added effect at reducing fire rate of spread or fire size at the landscape scale (Finney 2007).
- Treatments on non-BLM-administered lands would continue at the same rate and types of treatments that have over the past decade (2012-2022).

Analysis Methodology and Techniques

- The BLM would evaluate expected fire behavior (i.e., fire hazard) under 90th percentile weather conditions, either using spatial fire behavior modeling (e.g., Interagency Fuel Treatment Decision Support System or similar software) or stand-level fire behavior modeling software (e.g., NEXUS or similar software), based on the continuity and composition of the wildland fuel profile (i.e., surface fuels, ladder fuels, and canopy fuels) under each alternative.

- The BLM would evaluate how alternatives contribute toward reducing fire hazard within the above treatment thresholds for reducing wildland fire risk, for the "linear feature" strategy and the "area based" strategy.

Units of Measure

- 20-year progress toward achieving reduced wildfire risk thresholds.

Relevant Data and Information to Be Used

- LANDFIRE data, vegetation data (see Section 5.19), Community at Risk, alternative framework for treatments, locally identified Potential (wildland fire) Operational Delineation boundaries.

Analytical Conclusions to Be Answered

- How much each alternative would contribute toward achieving wildfire risk reduction to the Community at risk extent and within strategic areas to limit wildfire growth.

Analysis Display

- Maps and tables

5.22.2 How would the alternatives contribute toward restoring fire regimes?

Background

- Fire regimes characterize the spatial (size), temporal (frequency), and characteristic severity of fire disturbance based on historic fire frequency, severity, and patterns (See Section 6.29.2).

Geographic Scale of Analysis

- The decision area

Relevant Assumptions

- Ecologically functioning and resilient ecosystems exhibit fire regimes within the natural range of variability.
- LANDFIRE data represents fire regime groups.
- In the absence of natural fire as a frequent disturbance agent, management activities, including prescribed fire and mechanical thinning of vegetation, can serve as a partial surrogate for natural disturbance and promote and maintain wildland fuel profiles, vegetation structure, and composition that can facilitate fire effects consistent with the natural range of variability of historic fire regimes.
- The alternatives would provide a framework for reasonable assumptions around where and how much treatment would occur within the decision area.
- Expected fire behavior (surface, passive, or crown fire), estimated at 90th percentile fire weather conditions would serve as a surrogate for fire severity, where surface fire equates to low-severity fire; passive fire equates to moderate severity; crown fire equates to high severity fire.
- LANDFIRE fuel data is representative of wildland fuel profile within the decision area for the current condition.

- Effects of the proposed actions to surface fuels (represented by Fire Behavior Surface Fuel Models (Scott and Burgan 2005)) and canopy base height would be based on outcomes indicated by local monitoring data (e.g., USDI BLM 2021), literature, assumptions in the Rogue Basin Strategy for post-treatment fuel transitions (Metlen et al. 2017; Metlen et al 2021), LANDFIRE post-disturbance rules, and professional local knowledge.
- Effects of proposed actions to canopy fuels (canopy cover and canopy bulk density) would be based on vegetation model results (see Section 5.18).

Analysis Methodology and Techniques

- Evaluate expected fire behavior (i.e., severity) under 90th percentile weather conditions, either using spatial fire behavior modeling (e.g., Interagency Fuel Treatment Decision Support System or similar software) or stand-level fire behavior modeling software (e.g., NEXUS or similar software), based on the continuity and composition of the wildland fuel profile (i.e., surface fuels, ladder fuels, and canopy fuels).
- Evaluate changes to fire regime by displaying the distribution of acres of land with expected severity under various alternatives relative to the spatial distribution of severity characteristic of historic conditions , based on mapped historic fire regime using LANDFIRE data, as described in Section 6.29.1.
- Assess fire regime condition by reviewing time since fire surrogate disturbance (and/or disturbance [mechanical or wildland fire (prescribed or wild)], and associated severity of past disturbance.
- Evaluate the magnitude of departure from recent disturbance return intervals from fire regime NRV disturbance return intervals.

Units of Measure

- Proportion of landscape (e.g., subbasin (6th field HUC)) within expected fire severity and disturbance return intervals compared to discrete fire regime group NRV.

Relevant Data and Information to Be Used

- Treatment amount and location; LANDFIRE data, vegetation data (see Section 5.18), fire regime.

Analytical Conclusions to Be Answered

- Compare how much each alternative would contribute toward restoring fire regimes.

Analysis Display

- Tables and maps

5.23 ISSUES NOT ANALYZED IN DETAIL

5.23.1 Wild Horses

The Pokegama Herd Management Area (HMA) is partially within in the planning area (see **Section 6.20**). Current management of the Pokegama HMA is administered by the BLM Lakeview District, Klamath Falls Field Office under the SWO RMP and is outside the scope of

this Plan. Per Section 4710.21 D of BLM Manual 4710, Management Considerations, changes to Herd Areas or Herd Management Areas shall be made through a land use plan amendment, revision, or a new RMP. The boundaries can only be changed when the current boundary does not correctly portray where wild horses and burros were found in 1971 based on well documented historical data through the land use planning process. How management actions within the HMA would affect natural resources, including monument objects, would be analyzed as part of the cumulative effects analysis under the alternatives.

5.23.2 Wilderness

There is one designated wilderness area within the planning area. In 2009, Congress designated the now 24,707-acre Soda Mountain Wilderness (SMW). The Soda Mountain Wilderness would continue to be managed to preserve the wilderness character in accordance with BLM Manual 6330 and the Soda Mountain Wilderness Stewardship Plan.

Chapter 6. Planning Area Profile

This chapter of the AMS documents the current conditions, trends, and forecasts for resources, resource uses, existing nondiscretionary designations, and social and economic conditions in CSNM that are relevant to the purpose and need and the planning issues identified by the BLM. Unless otherwise noted, allocations are based on the current Approved RMPs, which include the 2008 CSNM RMP, the 2016 SWO RMP, and the 1993 Redding RMP (see Section 2.3).

6.1 ABANDONED MINE LANDS

Key Points

- Abandoned mine lands (AMLs) with potential physical and/or environmental hazards requiring remediation are scattered throughout the planning area.
- Literature review and remote sensing analysis suggests that most of these are likely non-hazardous mining prospects and occurrences.
- To date, only a handful of these sites and features have been properly inventoried and characterized.
- AML inventory work within the planning area is ongoing.

6.1.1 Current Conditions

Introduction to Abandoned Mine Lands

AMLs are lands where past mineral exploration, development, processing, and reclamation activities occurred (i.e., prior to January 1, 1981, and implementation of the 3809 surface management regulations), and which are now inactive and/or abandoned. Created prior to the environmental protection laws now in place, these relict landscapes often exhibit a range of mining impacts such as hazardous underground openings, mine water discharge, and contaminated soils that may pose a threat to water quality, public safety, and the environment. AML sites can vary widely in appearance, depending on the period of operation, available mining and recovery technologies, the scale and capitalization of the venture, the nature of the ore body or mineral deposit, and local topography, among other factors. Still, most AMLs are comprised of several common types of feature systems including excavations (e.g., adits, shafts, stopes, prospects, and quarries), support infrastructure (such as headframes, ore bins, mill sites, and dwellings), transport networks (including roads, tracks, trails, tram rails, ditches, etc.), and associated waste products (such as waste rock dumps, mill tailings, process waste, relict machinery, and trash dumps). Each of these feature system types may present hazards, requiring that all be inventoried and characterized to reduce or eliminate risks and liabilities. This is the primary way the AML program supports the BLM's core programs, by mitigating physical safety risks at AML sites on or affecting lands administered by the BLM, and by providing solutions to mine-degraded water quality and other environmental impacts (see BLM H-3720-1 Abandoned Mine Land Program Policy Handbook for additional details).

However, aside from the negative effects of historic mining, AML sites can also present heritage recreation opportunities, unique wildlife habitat for endangered species, and occasionally may still yield valid mineral discoveries (both in the unmined ground, and thru inefficiently processed historic mine waste). The fundamental objectives of the AML program are therefore to protect the public and to address environmental risks and liabilities on public lands associated with past mining, while returning these lands to productive uses. The federal authorities for AML closure and cleanup actions derive from 16 U.S.C. 1011, 30 U.S.C. 1231, 40 CFR 300, 42 U.S.C. 9601 et seq., 43 U.S.C. 1701 et seq., PL-104-208 124, and PL-105-277 136 – which authorize BLM to reduce environmental degradation, mitigate physical safety hazards, and reclaim abandoned mine lands. Additionally, 16 U.S.C. 470, 16 U.S.C. 1531, 30 U.S.C. 21 et seq., 30 U.S.C. 611-614, 30 U.S.C. 1201 et seq., 33 U.S.C. 1251 et seq., 42 U.S.C. 4321 et seq., 42 U.S.C. 6921-6924, and 42 U.S.C. 6962 et seq. present procedural and substantive standards and requirements which must be observed during AML cleanup and reclamation activities.

AMLs in the Planning Area

Historically, mining was a powerful force behind the exploration and settlement of Oregon and California. A tremendous exchange of people, goods, and ideas took place in the mid-19th century between the settlements of the northern Oregon Territory and the fabulously rich gold fields of California. Inevitably, prospectors were drawn to the streams and mountains of southwestern Oregon and northwestern California (particularly the area around Yreka), which became focal points of early mining. In some areas, like Waldo (Josephine County, Oregon), the effects were dramatic, with entire landscapes washed away and mountains honeycombed with thousands of tunnels and shafts in the search for gold and other valuable commodities. In other places, though, like the planning area, the mining impacts were more prosaic, extant now only as scattered prospect pits and patchy concentrations of haphazard workings.

Based on LiDAR remote sensing data, it is currently estimated that there may be more than 19,000 AML features on BLM lands in Oregon-Washington. For the Medford District (including lands that are now part of the CSNM), this includes at least 9,245 AML features, predominantly in the western half of the Ashland Field Office, the southwestern portion of the Buttle Falls Field Office, and scattered throughout the entirety of the Grants Pass Field Office. Of the 9,000 plus known features, more than 2,000 have been verified, validated, and characterized, yielding more than 200 physical safety closures and several environmental site cleanups. To date, very little of this work has included the planning area. There are at least 264 potential AML features of interest on BLM-administered lands in the planning area, identified thru a combination of LiDAR analysis, GIS database/literature review, and limited fieldwork. These are grouped into 38 areas of interest or potential AML sites. Refer to **Map 6-1**. Cascade- Siskiyou National Monument - Abandoned Mine Lands for the features and areas of interest. Only a handful of these sites and features have been verified in the field (primarily at the Buck Rock Tunnel site; cf. Cultural Resources summary), and no AML physical safety closures or reclamation actions have been undertaken within the Monument. Notably, all the identified AML sites are in the Oregon portion of the planning area. A more complete inventory of AMLs within the planning area would allow prioritization of sites for potential physical and environmental remediation.

Standard data sources for reconstructing the mining history of the area include databases such as BLM's internal Abandoned Mine Site Cleanup Module, the USMIN Mineral Deposit and Mineral Resource Data System databases from the United States Geological Survey (USGS), the Oregon Department of Geology and Mineral Industries' Mineral Information Layer for Oregon, release 3, as well as professional mining publications and period news pieces (cf. Minerals and Geology summary for additional details). These sources indicate that BLM-administered lands in the planning area were only moderately explored and prospected (mostly after World War II) and were otherwise unproductive in terms of hard rock metal mining (cf. Minerals and Geology for discussion of aggregate and industrial mineral production). Preliminary analysis of the features of interest using LiDAR feature morphometry and mensuration corroborates this. The identified features appear to be mainly surface workings (prospect pits, trenches, dozer cuts, open pits) that pose little or no physical hazard (aside from highwall features associated with quarries). However, in some instances, features were identified that appear to be shallow exploration adits. These are especially prevalent in the vicinity of the Mammoth, Lucky 13, Hopeless, and Buck Point prospects known from the literature, and would be a priority for inventory work in the planning area. The Mammoth, Lucky 13, and Hopeless prospects are also cinnabar/mercury occurrences, making them a higher inventory priority in terms of environmental characterization as well, although there is no evidence of actual mercury recovery noted in the literature. A snapshot of these historic mines, as provided by the Mineral Resource Data System, is summarized in **Table 6-1**.

Table 6-1. Select historic mines of interest in the planning area

Site Name	MRDS ID	PLSS	Commodities	Operation Type	Development Status
Buck Point Prospect	M061421	T39S R02E Sec 26 NWSE	Au, Ag, Cu	Surface	Prospect
Hopeless Prospect	M055885	T38S R02E Sec 09 NWSW	Hg	Surface	Prospect
Lucky 13 Prospect	M055886	T38S R02E Sec 09 SENW	Hg	Surface	Prospect
Mammoth Prospect	M055884	T38S R02E Sec 09 NWNE	Hg	Surface	Occurrence

Adapted from USGS Mineral Resource Data System (MRDS) 2011

6.1.2 Trends

AML inventories within the planning area are scheduled to continue based on available funding, with the aim of verifying, validating, and characterizing all historical mining impacts, and prioritizing sites which meet the funding eligibility and risk criteria requirements for physical and/or environmental hazard remediation (BLM H-3720-1, Sections 6-7). The highest priority for remedial actions is sites endangering human health and safety, or those affecting water quality. Additional program priorities would include establishing partnerships with other Federal, State, and Tribal agencies, identifying potentially responsible parties for cleanup sites,

reducing/minimizing the need for long-term remediation and monitoring if AML hazards are identified in the planning area, and continuing public outreach/education regarding the history of mining in southwest Oregon and the potential dangers associated with abandoned mines (stay out, stay alive).

6.1.3 Forecasts

Remedial work at AML sites within Monument, if required, should prioritize sites with physical and environmental hazards, with the goal of restoring these landscapes to productive uses. Priority AML sites that pose a risk to human health and the environment may include:

- Acid mine/rock drainage from mine openings and waste rock dumps
- Toxic mine tailings, process waste, and relict equipment near recreation areas, or in areas easily accessible to the public
- Mine waste in stream channels
- Mine openings (adits, shafts, inclines, stopes) accessible to the public, livestock, and wildlife

Based on the available evidence, the likelihood of the discovery of such sites within the CSNM is low. However, if such sites are identified in the planning area, future work may entail secure closure of physical hazards, and the requisite characterization and cleanup of any identified environmental hazards. These types of AML actions can also sometimes entail additional, associated cultural resources investigations, wildlife/habitat impact studies, and coordination with the minerals program. Cultural resource investigations may include the development of historic contexts, determinations of eligibility for the National Register of Historic Places (NRHP), and analysis of the area of potential affects for any given closure/cleanup operation. Wildlife/habitat assessments would typically entail surveys for bats and/or suitable habitat, in addition to standard Endangered Species Act species analysis and potential impacts. Finally, coordination with BLM minerals staff would not be required since no mineral leases can be issued in the CSNM, and likewise no mining claims can be located.

6.2 Areas of Critical Environmental Concern and Research Natural Areas

Areas of Critical Environmental Concern (ACECs), defined in the FLPMA, represent areas where special management attention is required to protect and prevent irreparable damage to any of the following categories:

- Important historical, cultural, or scenic values
- Fish and wildlife resources
- Other natural systems or processes
- Safety from natural hazards.

The BLM develops special management direction to protect the relevant and important values but does not apply special management when other management mechanisms adequately protect the relevant and important values or where designation is not warranted.

The BLM designs special management attention to move the relevant and important values onto a trajectory to reach a desired condition or to protect the relevant and important values from management actions or other human activities. This may include prohibiting or modifying certain management activities.

Research Natural Areas (RNAs) represent a specific type of ACEC. These areas are established and maintained for the primary purpose of research and education because the area has one or more of the following characteristics (43 CFR 8223.0-5):

- Typical representation of a common plant or animal association
- Unusual plant or animal association
- ESA-listed plant or animal species
- Typical representation of common geological, soil, or water features
- Outstanding or unusual geological, soil, or water features.

The RNA network in the Pacific Northwest represents a wide range of elevation, geology, topography, soils, and vegetation communities throughout the region. This network allows for evaluation of differential responses to environmental change in comparison to forests managed for sustained yield. The BLM manages them in partnership with the U.S. Forest Service, state natural resource agencies, and key private organizations. Within the planning area, two RNAs (Oregon Gulch and Scotch Creek) are managed under a Memorandum of Understanding between the BLM and the Nature Conservancy.

6.2.1 Current Conditions

There are seven ACECs and/or RNAs in the planning area, along with one other designation, the Mariposa Lily Botanical Area, which is recognized to protect the special ecological characteristics of the area (**Table 6-2**). Most of these areas were designated in the early 1990s and the newest, Tunnel Creek, was designated in 2005. (**Map 6-2**. Cascade-Siskiyou National Monument – Existing Designations).

Table 6-2. Existing ACECs and RNAs in the planning area

Name	Acres	District/ Field Office	ACEC - Relevant and Important Value or RNA - characteristic	Description
Lost Lake RNA ACEC	386	Medford/Ashland	Natural Processes	Mid-montane lake surrounded by mixed-conifer forest. Volcanic landslide-dammed lake; long-term vegetation monitoring site
Old Baldy RNA ACEC	470	Medford/Ashland Lakeview/ Klamath Falls	Natural Processes	Chinquapin/manzanita chaparral and high-elevation white fir-Shasta red fir forest; long-term vegetation monitoring site
Jenny Creek RNA ACEC	269[a]	Northern California/ Redding	Fish and wildlife; Important historical, cultural, or scenic values	Douglas-fir/ponderosa pine forests, Oregon white oak/western juniper woodlands, chaparral, mixed grasslands, rocky cliffs, waterfalls, talus slopes, Jenny Creek riparian woodlands, Jenny Creek Falls
Moon Prairie ACEC	27	Medford/Ashland	Natural Processes	Multi-layered stand of old growth Douglas-fir and white fir with Pacific yew, ponderosa pine and sugar pine
Tunnel Creek ACEC	79	Lakeview/ Klamath Falls	Fish and wildlife; Natural Processes	High altitude lodgepole pine fen with bog blueberry (*Vaccinium uliginosum*) and high diversity of sedge species; several Bureau Sensitive plants: *Carex capitata, Utricularia minor, Tomentypnum nitens*, and *Gentiana newberryi* var. *newberryi*, *Carex lasiocarpa* var. *americana*
Oregon Gulch RNA	1,047	Medford/Ashland	Unusual plant or animal association: Green's Mariposa Lily, Howell's false-caraway, and Bellinger's meadow-foam Natural values and accessibility.	Douglas-fir/ponderosa pine forest with a poison oak, hairy snowberry, or Piper Oregon grape; White fir moderately dry site forest with baldhip rose, hairy snowberry, and star flower understory; and Manzanita-wedgeleaf ceanothus/ bunchgrass chaparral
Scotch Creek RNA	1,795	Medford/Ashland	Typical representation of a common plant or animal association: Scientific research and as a baseline study area for chaparral vegetation	Two Eastern Siskiyou chaparral types: a Rosaceous type dominated by *Quercus garryana* with *Prunus subcordata, P. virginiana, P. emarginata*, and *Cercocarpus betuloides* and a different chaparral community dominated by *Ceanothus cuneatus*, *Arctostaphylos* species, and *Cerocarpus betuloides*

[a] Out of 966 acres total in the Jenny Creek ACEC RNA, only 269 acres are within the planning area boundary.

The BLM has developed RNA management plans for the Scotch Creek and Oregon Gulch RNAs (USDI BLM 2008, Appendix K and L, respectively).

The BLM is in the process of evaluating the Mariposa Lily Botanical Area as a potential new ACEC. The BLM acquired and designated the Mariposa Botanical Area (239 Acres) in 1995 primarily to protect the rare and endemic plant, Greene's mariposa lily. This open grass meadow provides a core, relatively undisturbed reference area that contains large populations of Greene's mariposa lily. The area also contains portions of the historic Oregon-California Trail and provides year-round habitat for blacktail deer and a small elk herd.

6.2.2 Trends

There are no status reports updating the implementation or effectiveness of the management directives in the Scotch Creek and Oregon Gulch RNA management plans.

There are no known status reports for the ACECs in the planning area; therefore, there is no information on whether field monitoring and data collection goals have been met.

The Mariposa Lily Botanical Area is the site of on-going volunteer community science and education. For nearly a decade, the BLM has partnered with local community groups to support stream water retention, grassland restoration research, and removal of yellow star thistle, an invasive weed. These groups provide annual stewardship events that engage and educate the community and provide hands-on experience with the biodiversity of the area.

6.2.3 Forecasts

Intact, functional ecosystems are a finite resource. In March 2023, the United Nations released a Synthesis Report summarizing the state of knowledge on climate change, its widespread impacts, risks, and mitigation (IPCC 2023). The report recognized the interdependence of climate, ecosystems, and biodiversity. In this report, the United Nations scientists urged land managers to reduce the conversion of natural ecosystems, citing preservation of intact systems as one of the most important actions needed. The Synthesis Report forecasts the increasing importance of ecosystems represented by the BLM's special designation areas.

Since the late 1960s, the BLM has participated with the Pacific Northwest Interagency Natural Areas Committee to establish and support a network that currently includes more than 580 natural areas in Oregon and Washington managed by 20 federal, state, and local agencies; private agencies; and organizations. The Committee has recently submitted grant proposals to improve visibility of the Natural Areas program with potential researchers, review the registry to address monitoring backlog, and access landscape-scale climate change resiliency. The Committee forecasts the continuing importance of ecosystems represented by the BLM's special designation areas.

The ACECs and RNAs in the planning area can serve as reference analogues for restoration on the ground and can be located with remote sensing for landscape-scale studies. As the need for landscape-scale studies of climate change continues, the need for intact ecosystems to use as reference sites would remain.

6.3 CLIMATE CHANGE

Climate change refers to long-term shifts in temperatures and weather patterns. These shifts may be a result of natural variation, human impacts, or through variations in the solar cycle or other natural phenomena. Since the 1800s, human activities have been the main driver of climate change, primarily due to burning fossil fuels like coal, oil, and gas (IPCC 2023).

6.3.1 Current Conditions

Current ongoing global climate change is linked to the atmospheric buildup of greenhouse gases (GHGs), which can persist for decades or even centuries. Each GHG has a global warming potential that accounts for the intensity of each GHG's heat trapping effect and its longevity in the atmosphere (Dello and Mote 2010; EPA 2023). Without significant reductions in greenhouse gas emissions, Oregon's annual temperature is projected to increase by 5°F by mid-century and by 8.2°F by the 2080s (Fleishman 2023).

Earth's average surface temperature in 2022 tied with 2015 as the fifth warmest on record, according to an analysis by the National Aeronautics and Space Administration (2023). Continuing the planet's long-term warming trend, global temperatures in 2022 were 1.6 degrees Fahrenheit (0.89 degrees Celsius) above the average for NASA's baseline period 1951-1980 (NASA 2023). During the 2005-2009 and 2015-2020 periods, Oregon experienced the highest number of extremely hot days in the historical record (NOAA 2022). In addition to the overall trend of higher average temperatures, the state has experienced below average numbers of very cold nights since 1990. The number of freezing days has been near or below average since 1995, and the 2000-2004 period had the lowest multiyear value. The state rarely experiences warm nights due to the moderating effects of the Pacific Ocean in the west and low humidity east of the Cascades (NOAA 2022).

6.3.2 Trends

As the concentrations of greenhouse gases continue to increase in the atmosphere, the earth's temperature is climbing above past levels. Continuing a long-term warming trend, globally averaged temperatures in 2022 were 1.5°F (0.85 °C) warmer than the 1951-1980 baseline average, and 1.9°F (1.1°C) warmer than late nineteenth century levels, representing the start of the Industrial Revolution (NASA 2023). All 9 years leading up to 2022 were the warmest years recorded since 1880, when modern record keeping began (NASA 2023). Other aspects of the climate, such as rainfall patterns, extreme drought, snow and ice cover, and sea level, are also changing.

In Oregon, temperatures have risen about 2.5°F since the beginning of the 20th century, and temperatures in the 1990s and 2000s were higher than any other historical period (**Figure 6-1**).

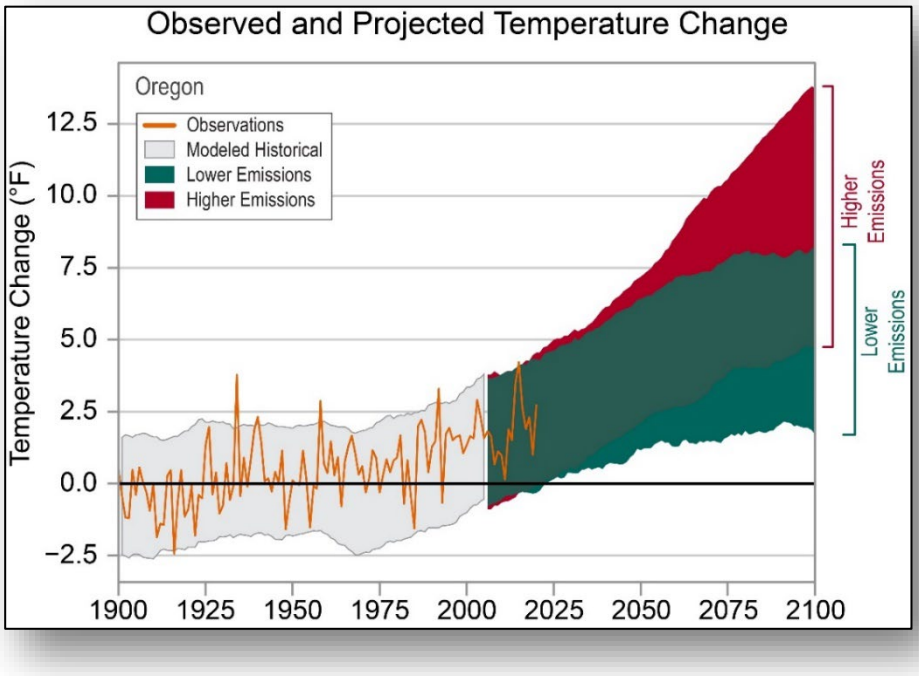

Figure 6-1. Observed and projected temperature changes in Oregon from 1900 to 2100

Reprinted from 2022 NOAA's National Centers for Environmental Information (NCEI) and the Cooperative Institute for Satellite Earth System Studies (CISESS)

The region recorded more warm nights and fewer cold nights between 1990-2016, including an increase of 4.1°F (2.3°C) for the coldest day of the year (Gonzalez-Benecke et al. 2018).

The state has experienced a dramatic increase in the number of very warm nights and a decrease in the number of very cold nights. As the state has warmed, the percentage of precipitation falling as snow during the winter has decreased, as have snow depth and snow cover (Frankson et al. 2022).

Unlike many areas of the United States, Oregon has not experienced an upward trend in the frequency of extreme precipitation events (**Figure 6-2**). The number of 2-inch extreme precipitation events has been highly variable over the historical record (since 1900) and mostly below normal since 2000. Since 1990, Oregon has had two 5-year periods with the highest and lowest frequency of extreme precipitation events (1995-1999 and 2000-2004).

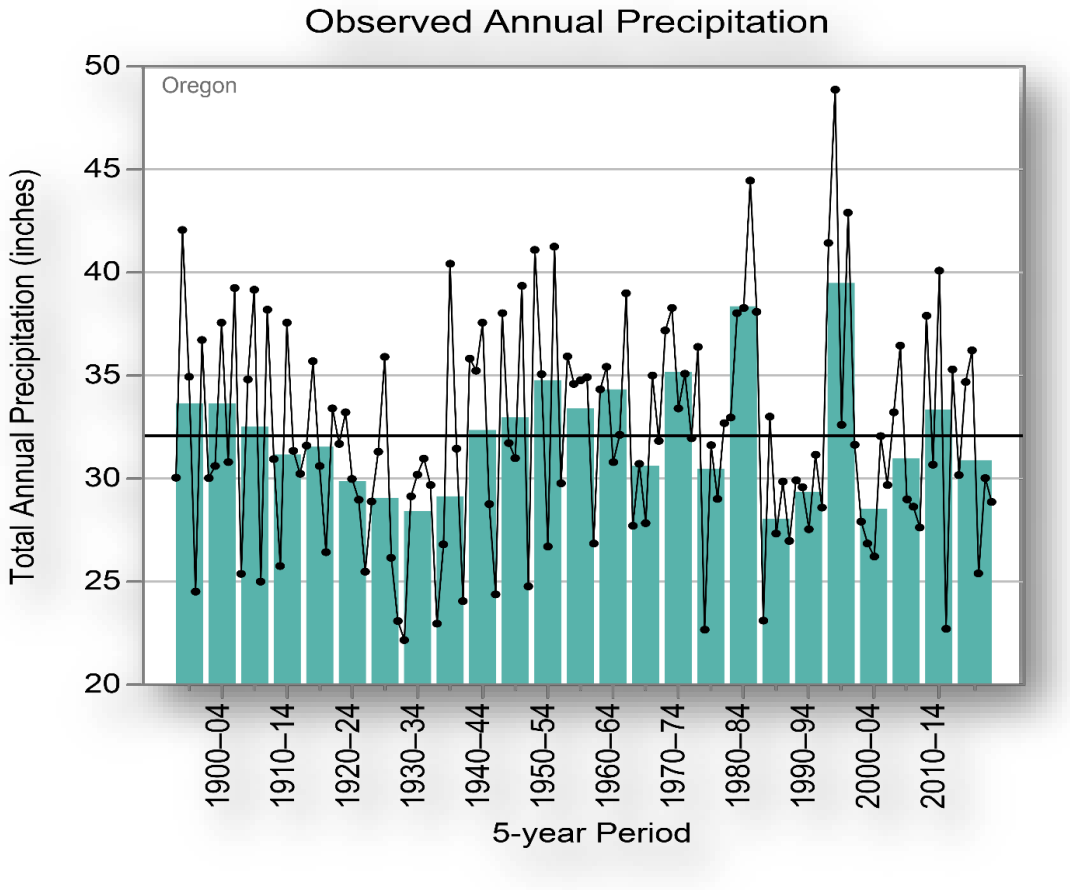

Figure 6-2. Precipitation changes in Oregon from 1900 to 2010

Reprinted from 2022 NOAA's National Centers for Environmental Information (NCEI) and the Cooperative Institute for Satellite Earth System Studies (CISESS)

6.3.3 Forecasts

Global climate models predict that warming would continue throughout the 21st century. Compared to observed historical temperatures, average warming is projected to increase from 1.3 to 4.0 °C by 2050, and from 2.7 to 4.8 °C by 2080. Precipitation may increase slightly in the winter, although the magnitude is uncertain (Halofsky et al. 2020).

Under a higher emissions pathway, historically unprecedented warming is projected during this century (**Figure 6-1**). Even with the lower emissions pathway, statewide annual average temperatures are projected to exceed historical record levels most likely by the middle of this century. However, a large range of temperature increases is projected in both emission scenarios.

In the lower emissions pathway, only a few projections are warmer than historical records (**Figure 6-1**).

Projected rising temperatures would raise the snow line—the average lowest elevation at which snow falls. This would increase the likelihood that precipitation would fall as rain instead of snow, reducing water storage in the snowpack, particularly at lower elevations that are now on the margins of reliable snowpack accumulation. While a few areas in eastern Oregon would experience a primary or secondary peak in precipitation in May, most areas of Oregon, including the planning area, would receive the bulk of their annual precipitation during the winter months. Thus, the snowpack at higher elevations would be an increasingly important source of water during the drier summer months. Higher spring temperatures would also result in earlier melting of the snowpack, further decreasing water availability for healthy ecosystems and critical sectors such as agriculture and recreation. (Halofsky et al. 2022)

Although projections of overall annual precipitation are uncertain, winter precipitation is projected to increase, and summer precipitation to decrease. More precipitation is expected to fall as rain instead of snow, which would decrease the amount of water from snowmelt available during the dry season and pose challenges for water management. These changes are of particular concern for areas that depend on the availability of irrigation water from snowmelt-fed basins. (Fleishman 2023; Halofsky et al. 2022)

6.4 CULTURAL RESOURCES

6.4.1 Current Conditions

The BLM defines cultural resources "as definite locations of past and present human activity, occupation or use in the physical environment, identifiable through field inventories, historical documentation or oral evidence" (BLM Manual 8100, The Foundations for Managing Cultural Resources). They include prehistoric and historic archaeological sites, buildings, structures, objects, districts, landscapes and viewsheds. They can also include locations on the landscape that have plants, animals, or topographic features that are considered important by a Native culture or community. Cultural resources are a critical link to our shared past, and connect modern communities to those who came before, helping us to understand and identify with people of different cultures and times.

Cultural resources are typically divided into two categories: historic and prehistoric. Prehistoric resources are considered any material remains, locations, structures, or items used or modified by people before Euro-Americans established a presence in the planning area. Examples of these types of resources include lithic quarrying and tool manufacturing locales, temporary or permanent residential sites, hunting blinds, fishing weirs, rock shelters, rock art, trails, and isolated finds. Historic resources refer to the material remains, locations, structures, or landscape alterations that have occurred since the arrival of Euro-Americans. Examples of these types of resources include trails and roads, homesteads or their remains, mining features, areas or districts, irrigation ditches for mining and farming, railroads, phone and power lines, trash scatters or dumps, corrals, cabins, and machinery.

Overall, management of cultural resources is largely driven by the National Historic Preservation Act and implemented through the National Programmatic Agreement between the BLM, the Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers. BLM's cultural resources program compliance is further directed through agreements with the individual State Historic Preservation Officers (SHPO). These statewide BLM and SHPO agreements are referred toas the "Protocol." The Protocol allows BLM offices to streamline the compliance (Section 106) process to reduce time and labor costs. Section 106 of the National Historic Preservation Act (NHPA) requires agencies to make a good faith effort to consider the potential effects of agency actions on historic properties (e g., cultural resources deemed eligible for or listed on the National Register of Historic Places (NRHP)) in consultation with appropriate parties as defined in 36 CFR 800. Such consideration normally takes place through the following process: 1) field survey or inventory to locate and document cultural resources; 2) evaluation of located sites for their NRHP significance; and, if the effect would be adverse, 3) seeking ways to avoid, reduce, or mitigate these effects.

The significance of cultural resources is assessed through a process of evaluation against a set of criteria developed for the NRHP. Sites that are listed or are eligible for listing on the NRHP must meet at least one of the criteria, and must possess some level of integrity of location, design, setting, materials, workmanship, feeling, and association. In general, the BLM manages specific sites according to the eligibility of sites to be listed on the NRHP and by assigning specific resources to BLM Cultural Resource Use Categories (Manual Traditional Use, Conservation for Future Use, Scientific Use, Public Use, Experimental Use, Discharged from Management). Sites are assigned to these Use Categories regardless of their NRHP eligibility.

All cultural resources listed on or eligible for listing on the NRHP are managed as directed by 36 CFR 800 - Protection of Historic and Cultural Properties. In addition, those sites that remain unevaluated for NRHP eligibility are treated as eligible until determined otherwise. Of the known sites within the planning area, 47 have been determined eligible for the NRHP, but have not been formally listed on the NRHP.

Currently, only a small percentage of the planning area has been surveyed for cultural resources, but there are more than 381 cultural resource sites and isolated finds recorded on BLM-administered lands in the CSNM boundary; these include sites that are pre-historic, historic or, multi-component (i.e., possessing both historic and pre-historic components), Sites range from as little as a few square yards to over 200 acres. Recorded sites are widely distributed across the CSNM.

Natural processes as well as land management practices, looting, and wildland fires can all affect cultural resource sites. An assessment of site condition is usually completed when a site is initially recorded or when it is monitored later. Due to the large number of recorded sites and a change in recordation standards through the years, the condition of many of the recorded sites in the planning area is unknown. Archaeological surveys have been conducted since the 1960s, but less than 30 percent of the planning area have been intensively surveyed for the identification of cultural resources. Typically, cultural resource surveys are undertaken in response to project planning and therefore are not being driven by a systematic and scientific approach that could predict where sites are most likely to be encountered. This compliance-driven survey (i.e., a

Section 106 survey) approach means that a variety of ecological or environmental areas are not being examined for cultural resources. As a result, the number of previously recorded sites is not a good indicator of how many undiscovered sites there may be in the planning area.

The Medford District's most recent cultural resource overview was completed in the1990s and included the Oregon portion of the planning area west of the Cascades. The Far Western Anthropological Research Group, Inc. completed a cultural resource overview in 2016 for the BLM Northern California District (King et al. 2016), and the Klamath Falls Field Office completed, also in 2016, an ethnographic study. These documents provide the framework and foundation for district cultural resource programs. Some of the overviews are now outdated, as archaeological investigations and research conducted in the intervening years has produced a large body of new information. A summary and synthesis of current archaeological information is necessary to assist BLM archaeologists in making determinations of eligibility for historic and prehistoric resources, as well as for making appropriate management recommendations. A cultural resource overview of the planning area is being contracted by the BLM Medford District in 2023.

Prehistoric

Archaeological evidence for early human occupations in the planning area date to approximately 10,000 years ago. Prehistoric cultures were typically highly mobile hunter-gatherers that essentially moved from one area to another throughout the year as resources became available. Although winter villages were often located near permanent lakes or streams where water and ample supplies of wood were available year-round, they also occupied tribally owned seasonal "field offices" that were returned to year after year. Each major resource had its own season, and individual family or village groups would coalesce in traditional gathering areas to assist each other in collecting large quantities of certain resources for storage. Of particular importance were annual fish runs, deer hunts, and root or seed harvests. These types of resources typically possess a "window" of opportunity for harvesting and require a substantial amount of effort to take full advantage of them. Within the planning area, these resources were abundant along major streams, in the upland meadows, and especially flatter more open areas in the east along Skookum Creek, Jenny Creek, and in Agate Flat.

Common prehistoric archaeological site types in the planning area are lithic tool-stone scatters and procurement areas, and village or temporary camp sites. Less common site types are rock art (petroglyphs and pictographs), rock features (i.e., storage pits or cairns), and rock shelters.

Historic

Exploration and trade by Europeans began as early as the 1500s along the west coast of North America. By the late 1700s, numerous expeditions from several countries had traversed the west coast, bringing guns, beads, textiles, and other goods to trade Native Americans for pelts. By the early 1800s, European explorers had reached the interior of Oregon, including the fur traders of the Hudson Bay Company, the Pacific Fur Company, and the North West Company Missionaries. Emigrants and military expeditions soon followed with the construction of several important trail systems, including the Oregon and California Trails. Between 1843 and 1855, approximately 60,000 emigrants traveled along the Oregon Trail into northeast Oregon.

Severe conflicts broke out in the 1850s between the Indians and the newcomers, with the discovery of gold and advent of thousands of miners and settlers to the region. Lands were opened up for mining and settlement as quickly as treaties with Native Americans could be signed. During the 1850s and 1860s most Native peoples were forcefully removed from the planning area. Many died from the warfare, disease, and starvation; others were captured and taken to reservations in the northern part of Oregon.

Settlement in the Rogue and Shasta valleys from the 1850s on spurred the development of a new way of life in the region. Farmers and ranchers began to transform the land. Newcomers built roads following the Siskiyou Trail and the Klamath River as well as the Applegate trail east of Ashland. Irrigation works began to move water about the landscape. Hunters severely depleted local game, and brought local extinction to grizzlies, wolves, antelope, and mountain sheep. Recreational use of the area for hiking, hunting, and fishing also began around the turn of the century.

Cattle and sheep ranching became a significant use in the planning area during the latter half of the nineteenth century. Ranches were established along the Klamath River corridor and its major tributaries, especially along Jenny Creek and Camp Creek, and along Bear Creek in Bear Valley.

Logging became more important in the planning area after the development of transportation routes, such as the railroad in 1887, and with the development of the orchard industry and its demand for wooden packing boxes. Small mills existed in the Ashland area and in the area around Lincoln east of Ashland. Major railroad logging operations existed east of the planning area, with logs from the pine forests of the flat plateau chuted down to the Klamath River and floated to a mill at Klamathon.

These early years of logging focused on the most accessible stands of timber, at lower elevations and on the high plateaus in the east, and on sugar pine. It was not until the middle of the twentieth century that developments in logging and transportation technology made logging of high-elevation timber stands more feasible.

The advent of government management in the early decades of the twentieth century brought significant land management policies to the planning area. Game laws and regulations helped local game populations. Federal grazing regulations eventually helped slow the degradation of some upland areas and began the slow, gradual process of recovery. Fire suppression became a mission, and fire-suppression policies began to transform the local vegetation patterns. A fire lookout was established on Soda Mountain in 1933.

Recreation continued to be important in the planning area throughout the twentieth century. Today, the Pacific Crest National Scenic Trail runs north-south through the planning area (**Map 6-2**. Cascade-Siskiyou National Monument – Existing Designations), bringing many hikers through the area and passing by Pilot Rock. People still use the area seasonally to hunt and fish. More recent recreational use includes the use of off-highway vehicles (OHVs), which allow individuals access to the area with a minimum of improved roads.

Common historic sites within the planning area include properties associated with the ranching, homesteading, transportation, utility corridors, and farming history. Old homesteads, farms, ranches and the remnants of structures, roads, fences, ditches, dumps, and other aspects of the

built environment can be found. Less common sites include historic cemeteries, mining cabins, and water developments.

6.4.2 Trends

Most of the recorded cultural sites have been identified through surveys the BLM conducts to comply with Section 106 of the NHPA. Cultural resource management direction focuses on preserving sites, and the avoidance of impacts to them because of project implementation. However, BLM is directed to manage sites eligible for the National Register of Historic Places until they are formally evaluated. Due to time and budget constraints, most sites are not evaluated, and must continually be protected from current and future projects. This protection is usually in the form of avoidance practices and as the unevaluated site numbers increase, so does the cultural resource compliance workload. The trend is an increase in sites that would need to be protected or mitigated with a concurrent increase in time needed to complete cultural resource work.

Site monitoring is done by both the BLM cultural program and law enforcement staff. The BLM cultural staff monitors sites as part of the Section 106 process to update previously recorded sites within a project area, and law enforcement usually monitors sites due to past and/or active looting. Surveys aimed at complying with Section 110 of the NHPA (proactive surveys) are not typically performed due to time or budget constraints. Therefore, many sites on public lands in the planning area are not recorded, and their condition is unknown. It is likely that the trend for these sites would be deterioration over time from natural processes including erosion, depositional processes, and fire as well as vandalism and looting to a point where they may no longer be eligible for the National Register.

6.4.3 Forecasts

As use of public lands for recreation and commerce increases, there is an increase in risk of effects to cultural resources. Cultural sites within the planning area are vulnerable to looting, off-highway vehicle traffic, wildland fire, and inadvertent effects due to land management decisions. These effects likely result from direct damage during project implementation, fire suppression activities, or, in the case of looting, unauthorized collecting, which removes significant artifacts from the surface of sites and depletes the archaeological value of the sites. Natural processes would continue to have effects on sites, structures, and features.

Tribes have indicated a desire to have an increased level of protection for ethnographic village sites, rock art and rock feature sites, and traditional gathering areas. The identification of Traditional Cultural Properties or tribal areas of use is also important to Native Americans and can be accomplished through partnerships with Tribes. These areas can then be designated ACECs or nominated to the NRHP as appropriate, giving them a higher level of protection.

Conducting additional surveys beyond those required for project-compliance could assist in identifying and protecting cultural resources, and partnerships with Tribes or volunteer organizations could help accomplish this. Identifying, documenting, and evaluating sites would ensure adequate protection and management of cultural resources before their values diminish or

are lost. Updating existing Class I Cultural Resource Overviews would assist the BLM in assessing the significance of cultural resources and improve management of them.

The BLM could develop activity management plans for cultural resources to provide better protection of areas with concentrations of cultural resources and to assist in acquiring funding for studies.

6.5 FISH AND AQUATIC HABITAT

The decision area (BLM lands within the Cascade Siskiyou National Monument boundary) includes numerous aquatic features which support aquatic organisms, some of which are endemic to the area. Aquatic habitat types include seasonal and perennial streams and springs (lotic habitats), and wetlands and wet meadow complexes, natural ponds and lakes, reservoirs, and small impoundments (lentic habitats). The planning area includes portions of seven large fifth-field watersheds: Jenny Creek; Cottonwood Creek; Spencer Creek; Bogus Creek; the Klamath-Iron Gate Watersheds, the streams of which flow generally south from the area and are within the Klamath River Basin; and the Bear Creek and Little Butte Creek Watersheds, the streams of which flow generally north and are within the Rogue River Basin (**Map 6-3.** Cascade-Siskiyou National Monument - Aquatic Resources). The Rogue and Klamath Rivers both support populations of economic, recreational, and culturally important anadromous fish including salmon and steelhead. Most of the planning area is located above anadromous fish use, and fish populations within the planning area are composed primarily of resident fish, native and introduced. Within the large planning area there are 57 miles of fish-bearing streams and 789 acres of other aquatic habitat, including lakes, reservoirs, and wetlands. (**Table 6-3**).

Table 6-3. Fish-bearing stream miles and acres of ponded or slow water habitats and wetlands within the decision area

Watershed	Acres Within Decision Area	Total Stream Miles	Fish Stream Miles	Lentic Habitat Acres[a]
Jenny	60,297	356.7	34.8	522.8
Cottonwood	5,885	26.3	1.1	1.5
Spencer	2,571	5.2	0.5	93
Bogus	635	4.6	0	0
Kl-Irongate	16,964	107.6	12.8	10.7
Bear	20,029	174.1	5.5	74
Little Butte	7,122	49.2	2.3	86.6
TOTAL	**113,503**	**723.7**	**57**	**788.6**

[a] Fish use of lentic habitats is primarily limited to the larger reservoirs, which are the least prevalent lentic feature but are the largest percent of acres of lentic habitat.

Management of fish populations and other aquatic species is the authority of the respective state agencies; the Oregon Department of Fish and Wildlife determines which areas are open to fishing, fishing seasons, bag limits, gear restrictions, and issue and regulate fishing, hunting, and trapping licenses. The California Fish and Game perform a similar function for species in waters within the state of California. These agencies also stock many waterbodies, including some areas

within the planning area, with hatchery bred fish to provide for recreational fishing opportunities. Most of the fish bearing waterbodies within the planning area are open to recreational fishing during certain seasons.

The BLM manages aquatic habitat for species on BLM lands. Management activities relevant to aquatic habitats include the establishment of Riparian Reserves to protect and promote riparian vegetation, essential for providing shade and a source of large wood and nutrients to aquatic habitat. They also function to protect water quality and aquatic habitat from management activities that may occur in upland areas. Other notable management actions include replacing or removing culverts that restrict fish passage or downstream passage of critical bedload (gravel, cobbles, large wood, etc.); implementing appropriate project design features to protect water quality from various management activities; and active restoration, such as placing instream wood structures or planting of riparian species, decommissioning or maintenance of road segments that contribute to aquatic habitat degradation, and constructing and maintaining fences to exclude cattle from sensitive aquatic habitats.

Currently, aquatic and riparian habitats within in the original Monument footprint are managed under the Aquatic Conservation Strategy (ACS), a strategy carried forward from the Northwest Forest Plan. The ACS was developed to "restore and maintain the ecological health of watersheds and aquatic organisms contained within the CSNM." The ACS consists of four main components that include delineation of Riparian Reserve widths of varying sizes, including two site-potential tree height widths adjacent to fish bearing streams; the establishment of Key Watersheds for watersheds that are crucial to at risk species (Jenny Creek is a designated Key Watershed); Watershed Analysis, which directed the agency to conduct analysis of all watersheds in the Monument to enable watershed planning, including prioritization of areas for restoration; and watershed restoration, to restore watershed health and aquatic ecosystems. The ACS further identifies nine management objectives to be met when planning management activities that focus on maintaining and restoring critical physical, biological, and process-based elements that influence watershed function and health. All management activities are evaluated against each of these nine criteria to ensure that proposed activities are consistent with the ACS. Areas within the expanded Monument in California are currently managed under the Northwest Forest Plan and incorporate the ACS as part of the management direction for aquatic resources.

Aquatic areas within the expanded Monument in Oregon are not managed under the Northwest Forest Plan's (NWFP) Aquatic Conservation Strategy (ACS), which was not carried forward in the Southwestern Oregon ROD/RMP. However, the Southwestern Oregon ROD/RMP does include an aquatic conservation strategy, including management objectives that correspond to each of the nine "objectives" of the NWFP ACS. FEIS 1842-44; NMFS BO 25-27; BLM Aquatics BA 605, 612-14, 625-638. The 2016 SWO RMP also goes a step further by including more specific and detailed "management direction" for particular activities to help achieve these objectives and maintain and restore aquatic habitat, which the NWFP lacked in any comparable detail. The SWO ROD/RMP also includes the designation of Riparian Reserves with one site-potential tree height width, instead of the NWFP's two site-potential tree height, because one tree is sufficient to maintain and restore stream conditions important to listed aquatic species, including water temperature, wood delivery to streams, and minimization of sediment. Two trees do not contribute significantly to functions needed for clean water and fish (NMFS BO pp. 172-320, 323-33).

The Oregon portion of the expanded Monument is managed under a strategy of sub-watershed classes, which were delineated primarily on the inherent habitat value for anadromous fish. In the expanded Monument, the Little Butte and Bear Creek sub-watersheds, which support anadromous fish in reaches downstream of the planning area, are designated as class 1. Sub-watersheds in the Jenny, Klamath-Iron Gate, and Spencer Creek Watersheds in the Oregon portion of the expansion are designated as Class 3. A difference between the two designations is Riparian Reserve widths, which are one site potential tree height (over 150 feet) for intermittent streams under the Class 1 designation, and 50 feet for (fishless) intermittent streams in designated Class 3 sub-watersheds. Restoration is included in management direction for Riparian Reserves in all sub-watersheds in the expansion area.

6.5.1 Current Conditions

Current conditions vary widely across the large planning area and are reflective of past and ongoing land and water use practices (e.g., construction and operation of reservoirs, diversion of water between watersheds and basins, forest and range-land management practices), geologic and topographic considerations (e.g., soil types and their inherent water holding capacities, elevation, aspect, precipitation regime, plant communities), and changes in climate and fire return interval. In general, water is more prevalent at higher elevations and in northern and western portions of the decision area, though all areas have been negatively impacted by a prolonged and ongoing drought that has affected the entire region, resulting in reduced stream flows and reservoir levels. Across all watersheds, notable ongoing and/or historic uses with impacts to aquatic resources include cattle grazing, beaver trapping, and timber harvest and associated road construction and maintenance. Construction and operation of large reservoirs, drought, and grazing (both legacy and ongoing impacts) have the largest influences on aquatic habitat within the planning area at present.

Klamath Basin Watersheds

Jenny Creek Watershed

The Jenny Creek Watershed comprises the bulk of the planning area by watershed. The BLM-administered lands include 45 percent of the watershed within the planning area. Fish streams include the mainstem of Jenny, Soda, Keene, Spring, and Beaver Creeks, which are all perennial streams, and Lincoln, Johnson, Corral, Skookum Creeks and Oregon Gulch, which are seasonal streams, at least for large portions of their stream networks. Hyatt, L Hyatt, Howard Prairie, and Keene Creek reservoirs, which sit at the top of the watershed, are also fish-bearing, though they contain primarily introduced fish that support recreational fisheries. These reservoirs capture, store, and divert roughly a third of the annual run-off out of the Jenny Creek watershed to the Bear Creek watershed in the Rogue Basin (USDI BLM 2005).

The upper portion of the watershed drains a relatively flat table land (the Dead Indian Plateau), while lower Jenny Creek flows south through steeper gradients and includes canyons and a large double-barrier falls located at approximate river mile 2.5. The barrier has resulted in isolated populations of fish in Jenny Creek. Below the falls, Jenny Creek eventually flows into Iron Gate Reservoir, a large impoundment on the mainstem Klamath River.

Native fish in the watershed above the falls include only three species; a unique population of "dwarfed" Klamath small-scale sucker (*Catostumus rimiculus*), known as the Jenny Creek sucker; speckled dace (*Rhinichthys osculus*), by far the most abundant fish species in the watershed; and redband trout (*Oncorhynchus mykiss* spp.). These populations were left isolated by the formation of Jenny Creek falls, which allowed the eventual expression of the unique dwarf form of the Jenny Creek sucker to be expressed. There is some indication that the speckled dace above the falls may also be a genetically distinct population. Redband trout are a subspecies of rainbow trout that are uniquely adapted to withstand warmer water temperatures than other populations of rainbows, a key advantage to survival in Jenny Creek which experiences high summer water temperatures in its lower mainstem reaches (see Section 6.8.1). Native fish species below the falls are reported to include marbled sculpin (*Cottus klamathensis*) and Pacific lamprey (*Entosphenus tridentatus*) (USDI BLM 1995b). It is unlikely that Pacific lamprey, an anadromous species that must migrate to the ocean and back to complete its lifecycle, are still present due to Iron Gate dam which does not allow for any fish passage past the dam.

There are currently no threatened or endangered fish species in the Jenny Creek Watershed. However, the Jenny Creek sucker is a BLM Sensitive species and is listed by the USDI Fish and Wildlife Service as a species of concern. Jenny Creek suckers are thought to spawn in upper mainstem and tributary reaches of the watershed, and to utilize suitable habitats in mainstem Jenny Creek for the remainder of the year. Once present in large numbers in Keene Creek (Hohler 1981), suckers appear to have been extirpated from this important tributary stream due to a diversion dam near the mouth of Keene Creek. Redband trout are dispersed throughout all accessible reaches of Jenny Creek and its tributaries, and Keene Creek is likely a very important spawning stream for them, as numerous young fish are observed there during repeat snorkel surveys. They are much better suited to jump small obstacles such as short diversion dams than suckers are, and the diversion near the mouth of Keene Creek does not appear to be an impassable barrier to them. There is potential that the redband genetics have been diluted in Jenny Creek due to hybridization with introduced rainbow trout (USDI BLM 2005). Speckled dace are also widely distributed throughout the watershed. They prefer the lower gradient reaches and can be found in great abundance in the meadow reaches of Jenny and Keene Creeks. Johnson Creek is another large tributary in the watershed. Much of the mainstem of Johnson is either intermittent (lower reaches), or interrupted perennial (upper reaches), so much of the fish use is seasonal. Populations of cascade frogs (*Rana cascadae*) and rough-skinned newts *(Taricha granulosa*) have been observed in the portion of the Johnson Creek drainage area on the Klamath Falls BLM Field Office, both of which are rare to the area, and the newt population may represent the eastern extent of their range in this area (personal communication with Roninger R, Klamath Falls Field Office Fish Biologist, January 27, 2023).

Many non-native fish have been introduced to the watershed, including rainbow trout, which are regularly stocked in the larger reservoirs, golden shiner (*Notemigonomous crysoleucas*), brown bullhead (*Ictalarus nebulosous*), black crappie (*Pomoxis nigromaculatus*), largemouth bass (*Mircropterus salmoides*), green sunfish (*Lepomis cyanellus*), and pumpkinseed (*Lepomis gibbosus*) (USDI BLM 2005), which were all introduced as bait or game species. These introduced species are primarily found in the reservoirs, and do not thrive in the flowing stream reaches, though golden shiners and bullheads have been observed in small numbers in the mainstem of Jenny Creek on occasion. Irongate Reservoir is known to have populations of

another introduced fish species, the yellow perch (*Perca flavescens*), and these fish may be found in lower gradient areas accessible to them on the mainstem of Jenny Creek in California.

Other native aquatic fauna of note within the Jenny Creek Watershed includes the signal crayfish *(Pacifastacus leniusculus*) beaver (*Castor canadensis*), the threatened Oregon spotted frog (*Rana pretiosa*), the foothill-yellow legged frog (*Rana boylii*) the Western pond turtle (*Actinemys marmorata*), Pacific giant salamander (*Dicamptodon tenebrosus*), and numerous species of aquatic mollusks, including several endemic pebble snails (*Fluminocola* spp.). Introduced American bull frogs (*Lithobates catesbeianus*) and ringed crayfish (*Orconectes neglectus*) are also commonly encountered in Jenny Creek.

Aquatic habitat in the watershed includes both lotic and lentic habitats. Native fish are primarily found in the lotic habitats. Jenny Creek and its principal tributary, Keene Creek, are the largest and most important streams for native fish. Habitat in Jenny Creek, and to a lesser extent in Keene Creek, as both streams flow from north to south, can broadly be described as an alternating series of low gradient meadow reaches broken by higher gradient canyon reaches from its headwaters to about the Oregon/California border. South of the border Jenny Creek flows through a steep canyon until its confluence with Iron Gate Reservoir. Cascades separated by deep scour pools are common features in this reach, and substrates are dominated by boulders with areas of exposed bedrock. The meadow reaches include braided channels with smaller grained substates being more commonly found in these low gradient reaches. Willows and alders predominate the riparian vegetation in the meadow reaches, while the canyon sections are generally more forested with conifers being more abundant. In lower reaches of Jenny Creek Oregon ash is a commonly encountered riparian species. Beavers were there historically and, though their population is much diminished presently, they are still important ecosystem engineers in the lower gradient reaches, where remnants of old beaver dams are still apparent in some areas. The dams resulted in large deep pools which slowed and stored water during the spring run-off on adjacent flood plains and helped to create and maintain important slow and deep-water habitats for other aquatic organisms. Large wood serves a similar function as beaver dams in some of the higher gradient forested reaches and contributes to important habitat diversity for the native fish in Jenny Creek. Past and ongoing instream restoration efforts in Jenny and Keene Creeks include the addition of large wood and structures that mimic beaver dams. Keene Creek also flows through both meadow and forested sections, though meadows are not as prevalent as forested reaches. Upper Keene Creek includes two impassable barriers to upstream fish migration at the dams that impound Keene Creek and Little Hyatt reservoirs. The reach of Keene Creek above Little Hyatt is sometimes de-watered for periods as the Bureau of Reclamation stops outflows to fill Hyatt Reservoir. When this occurs fish must fall back to Little Hyatt Reservoir to avoid stranding and desiccation.

One of the largest impacts to aquatic habitat and fish populations in the watershed results from the transfer of large amounts of water out of the watershed, which has reduced flood frequency and magnitude. The reduction of high flow events is thought to have altered both physical and biological characteristics of Jenny Creek. The lack of high flows has reduced the ability of the stream to transport accumulated fine sediments, which in turn has reduced cover and habitat for some aquatic species. It has also been speculated that it has allowed certain species to proliferate, including a species of caddis fly that is a prolific grazer of algae, which is the preferred food source of Jenny Creek suckers (USDI BLM 2005). In addition to the transfer to the Rogue Basin

from the large reservoirs at the top of the watershed, Spring Creek, which emerges at Shoat Spring in the lower Jenny Creek Watershed, is also mostly diverted away from Jenny Creek to supply water via Fall Creek to a small hydro-electric power plant near Irongate Reservoir, and eventually to supply the city of Yreka with municipal water. This diversion is especially notable given that historically Spring Creek would have doubled the amount of water present in lower Jenny Creek during the driest portions of the year and would have significantly cooled the water from this portion of Jenny Creek down to its mouth during the hottest times of the year. The diversion of Spring Creek has reduced both the quantity and quality of aquatic habitat in lower Jenny Creek.

Historic grazing practices in the watershed also led to long-lasting negative impacts to aquatic habitat. Some areas which were intensely grazed were subjected to stream straightening via physically moving the creek and constraining it with berms to enlarge pastureland, which in turn led to stream downcutting, in some areas to bedrock, as channel sinuosity was reduced. This degradation was compounded by reductions in riparian vegetation, and impacts to sensitive banks, resulting in increased erosion and sediment deposition to areas. Many of these areas have recovered significantly in the past 20 years due to retirement of the grazing allotments and active restoration. However, trespass cattle do still annually impact certain reaches of Jenny Creek, notably on the former Box O Ranch (now a large, restored meadow reach of Jenny Creek within the Soda Mountain Wilderness area) in the lower watershed, and in the Fredenburg Springs area, a large meadow complex on Jenny Creek in the upper watershed. Efforts are ongoing to maintain, and in some cases construct new, fences to exclude cattle from sensitive areas. The ongoing drought is also impacting lotic habitats, reducing the amount of water available in channel, and exacerbating stream temperatures, which are high, particularly in lower reaches of Jenny Creek during July and August. This has acted to further reduce both quantity and quality of aquatic habitat throughout the watershed.

Lentic habitats in the planning area provide only limited habitat for native fish. Little Hyatt and Keene Creek reservoirs both support populations of native speckled dace, but they also serve as longstanding non-natural passage barriers to upstream migration, are largely habitat for non-native fish, and facilitate the diversion of water outside of the basin. The trout populations in these reservoirs are mostly non-native rainbows of hatchery origin. Other lentic habitats include the Parsnips Lakes, the old Fredenburg mill pond, and numerous other small, non-natural impoundments. While most are not habitat for fish, many of these provide important habitat for other aquatic species, notably the Oregon spotted frog and the western pond turtle. Introduced fish have been observed periodically in some of the area pump-chances, including one pump chance near Keene Creek that has an established population of goldfish (*Carrassius auratus*). The drought has resulted in historically low reservoir levels in recent years and has also reduced the volume of water available to the other lentic habitats.

Cottonwood Creek Watershed

The Cottonwood Creek Watershed is a large watershed in the Klamath Basin. Very little of it (9 percent of the watershed) is within the planning area, and BLM-administered lands include only approximately one mile of fish-bearing stream channels; short portions of the east fork of Cottonwood Creek, totaling approximately 0.3 miles and approximately three-quarters of a mile of Bear Gulch, a tributary to the east fork, all located to the west of Interstate 5 in the Colestine

Valley. Cottonwood Creek flows south out of Oregon to its confluence with the Klamath River near the community of Hornbrook, California. Because it joins the mainstem Klamath below Irongate Dam, it is accessible to anadromous fish, including Coho salmon (*Oncorhynchus kisutch*), listed as threatened under the Endangered Species Act. Coho have not been documented as far upstream as the short reaches within the planning area. The area was surveyed in 1999 by the Oregon Department of Fish (ODFW 1999a) and surveys found steelhead (*Oncorhynchus iridium*), a form of anadromous rainbow trout, but no Coho. It is possible that Coho could access these reaches during favorable environmental conditions, and when in doubt steelhead presence is often used as a surrogate for Coho habitat. Other fish present in the east fork are not well documented but likely include sculpin and cutthroat trout. The headwaters of one other drainage, Hutton Creek, are also included in the planning area. Hutton Creek flows south out of the Soda Mountain Wilderness Area. The drainage area within the decision area is comprised entirely of intermittent streams, which are likely too steep and too far away to be accessible and seasonally used by fish populations in lower reaches of Hutton Creek, which is reported to support steelhead in its lower two miles (USDI BLM 2005).

Little data existed on aquatic habitat conditions in Cottonwood or Hutton Creeks within the decision area during the initial planning efforts for CSNM in 2002, and the same holds true today. The 1999 survey notes for the east fork of Cottonwood Creek indicated that instream habitat conditions were generally poor, though there was limited spawning and rearing habitat available for steelhead and trout, but that other areas were deeply incised, and that silt and fine sediment dominated the substrate, large wood was lacking, and that riparian vegetation was sparse. Much of the survey was conducted on private lands, and as noted, most of the stream network is located on private lands. In contrast, Hutton Creek within the planning area is entirely on BLM-administered lands. It is very remote and difficult to access and has never been surveyed. It is within the footprint of the 2018 Klamathon fire and portions of the drainage were impacted by the fire. As it is steep ground located within the Soda Mt Wilderness, it is doubtful that it has been much impacted by anthropogenetic disturbances other than grazing, which is no longer authorized here. Rehab work conducted on the old Schoeheim Road, which was opened and used as a fire line, included repair work to the road/stream crossings. Subsequent site visits during the following spring noted that the crossing locations were all dry. The channels through the crossings were stable, indicating that it had not suffered from excessive erosion following the fire and first wet season. The ongoing drought has likely had a large impact on aquatic habitat in the planning area portion of the Cottonwood Creek Watershed; Cottonwood Creek has been observed to be dry numerous times in recent years near its confluence with the Klamath River.

Spencer Creek Watershed

The Spencer Creek Watershed is a tributary to the Klamath River, flowing into John C. Boyle Reservoir, just west of the community of Keno, Oregon. Very little of the watershed (less than 3 percent) is within the planning area, which includes only a portion of a wetland complex along Tunnel Creek and a small unnamed perennial tributary to Tunnel Creek totaling less than 1 mile of perennial stream network. Fish documented in Tunnel Creek include, in order of prevalence, tui chub (*Siphateles bicolor*), speckled dace, fathead minnow (*Pimiphales promelas*), brook trout, and brown bullhead. Only the tui chub and dace are native to this area. While not recently documented, it is suspected that redband trout may be able to access Tunnel Creek and may be

periodically present, and Klamath smallscale suckers may also be able to access Tunnel Creek during optimal conditions. The portion of the planning area that includes Tunnel Creek is a designated ACEC, in recognition of its unique habitat and presence of an isolated population of threatened Oregon spotted frogs. Tunnel Creek flows through a fen, a unique type of wetland that is very sensitive to disturbances. The fen is fed by springs and Tunnel Creek. Surface water elevations are enhanced by the presence of beaver and their complexes, which provide for spotted frog habitat even during periods of drought (personal communication with Roninger R, Klamath Falls Field Office Fish Biologist, January 27, 2023). Numerous restoration activities have occurred within the ACEC, including fencing to exclude cattle, planting of riparian species to enhance beaver habitat, removal of encroaching conifers, and prescribed fire used to promote regeneration of aspen stands. Like other watersheds within the planning area, drought has reduced water availability in this area and is the biggest threat to this unique habitat. Other identified threats include unauthorized grazing, as cattle sometimes get inside exclosure fences, the presence of non-native fish which pose a direct threat to the Oregon Spotted Frog population, and conifer encroachment.

Bogus Creek Watershed

The Bogus Creek Watershed spans both sides of the Klamath between the Klamath Iron Gate and Cottonwood Creek Watersheds in California. Less than one percent of the watershed, and less than one square mile of BLM-administered lands, fall within the planning area within this watershed. There are no fish populations or fish habitat within the planning area. There are numerous small intermittent channels that drain the steep, rugged, and arid south facing slopes. The portion of the watershed within the planning area is very remote, located south of the Soda Mountain Wilderness boundary. The 2018 Klamathon fire burned through the watershed, likely impacting what limited riparian vegetation may be present within the planning area of this watershed.

Klamath-Iron Gate Watershed

The Klamath-Iron Gate Watershed includes all the small frontal drainages that flow into Irongate Reservoir both west and east of Jenny Creek. Forty percent of the watershed is within the planning area. Most of the watershed area is rugged, remote, and difficult to access, and hence very few surveys have been conducted for fish and aquatic habitat in the watershed. Fish-bearing streams in the watershed planning area include Slide, Scotch, Camp, Dutch oven, and Fall Creeks. These streams provide habitat for rainbow/redband trout. To date, genetic analysis has not been performed on these populations to definitively determine their lineage. The diversion of water from Spring Creek to Fall Creek allows for the transfer of fish, and BLM surveys (USDI BLM 2004) documented rainbow trout that appeared to be redbands in the diversion canal. These fish almost certainly have colonized into suitable habitat in Fall Creek, and perhaps vice versa, though the entrance to Spring Creek above the diversion may not be passable by fish. No other fish species have been documented in the streams within the planning area, though it is possible that sculpin and Klamath smallscale suckers could use low gradient portions just upstream of the reservoir in Scotch Creek. Non-native fish present in the reservoir would also have access to these areas. Camp Creek and Fall Creek are known to provide habitat for endemic species of pebble snails (USDI BLM 2000a). Dutch Oven and Fall Creek (below where it is fed by perennial springs) have the most reliable surface water during the hot summer months, while

many of the other drainages include reaches that dry up on an annual basis. Dutch Oven Creek also has perennial springs in its headwater areas, and pebble snails have been documented in some of these springs. All these streams flow south from their headwaters on the Cascade/Siskiyou divide. The Fall Creek drainage lies east of the Jenny Creek Watershed, while the other streams are west of Jenny Creek.

The streams to the west of Jenny Creek, which drain the Soda Mountain Wilderness, can generally be characterized as small and narrow high-gradient streams confined by steep topography throughout much of their lengths, with gradients moderating only in the lowest reaches near their confluences with the reservoir. Large substrates (boulders, cobbles, and bedrock) dominate the stream beds (USDI BLM 2000a), while suitable sized spawning gravels are generally lacking throughout most of these streams. There are a series of bedrock falls in lower Camp Creek which are fish passage barriers. Deep pools and large wood are lacking in all of these streams, and fast water habitats, such as cascades and rapids are common. These streams were all impacted to some degree by the 2018 Klamathon Fire, which was stopped at the west bank of Camp Creek. During fire suppression repair along the closed Schoheim Road, the BLM observed that the riparian areas, at least near the road crossings, did not appear to have been subject to high severity fire and most of the riparian trees had survived. Riparian vegetation in these drainages range from sparse, oak woodlands in rockier, exposed, and less productive sites, to large conifers in the deeper canyons. Riparian corridors are very narrow in most areas. Willows, big leaf maples, and ash are also present in numerous reaches. Fall Creek drains much gentler topography, and as such is relatively low gradient north of the Oregon border, and finer grained substrates including suitable spawning gravels are the dominate substrate. Beaver was historically found in this area, and their dams would have created high quality aquatic habitat and allowed for the storage of water during high flow events on adjacent floodplains. Large wood was reported to be in good supply in this area (USDI BLM 2000a). The stream gains a significant volume of water just north of the border from the Spring Creek diversion. Below the border, the stream gradient picks up significantly. Fall Creek enters Irongate Reservoir below a series of cascades and falls, and after being run through a small powerplant located near the Reservoir. Very little (less than 1 mi of fish bearing channels) of Fall Creek is within the planning area, as most of its drainage area lies east of the Monument boundary. Fall Creek was impacted by the 2014 Oregon Gulch Fire, which burned through numerous areas of this drainage at moderate to high severity. This resulted in the loss of many mature overstory riparian trees adjacent to Fall Creek.

Other impacts to aquatic habitat of note include legacy impacts from grazing, which was widespread throughout the watershed, and which still occurs in areas of Fall Creek outside the planning area. No recent physical habitat survey data for these streams exist, but surveys conducted by the ODFW in 1997 (before Monument designation) noted high levels of bank erosion, some of which was identified as having been caused by cattle in the East Fork of Camp Creek. Within the last decade BLM hydrology staff have not noted excessive bank damage in this area, suggesting that removal of cattle from this landscape has allowed for the recovery of riparian vegetation and stabilization of stream banks. Feral horses are also commonly found in this area, though impacts to aquatic resources from feral horses have not been documented. The Klamath-Iron Gate Watershed Assessment, completed in 2000, noted aquatic habitat impacts associated with roads in several of the drainages. Most of these roads have since been decommissioned and/or obliterated following the wilderness designation. The biggest impact and

threat to aquatic habitat in this watershed presently is related to water shortage issues due to the ongoing drought, which has led to reduced stream flows within these channels, earlier drying up of intermittent channels, and even drying up reaches of what were historically perennial channels.

Rogue Basin Watersheds

Bear Creek

The Bear Creek Watershed is large watershed that has been highly altered. Much of it is urban as it flows through the major population centers of the Rogue Valley. The southeastern quarter of the watershed, approximately 18 percent of the total watershed area, is within the planning area. Fish bearing streams within this area include Emigrant Creek and its tributaries, Tyler, Baldy, Green Mt, Porcupine, and Carter Creeks, and Sampson Creek, which flow into Emigrant Reservoir just south of the town of Ashland, Oregon; and Walker and its primary tributary, Cove Creek, which flow to Bear Creek below Emigrant Reservoir. Emigrant dam is a complete passage barrier, and hence is the end of anadromy in the Bear Creek Watershed. Therefore, Sampson and Emigrant Creeks and their tributaries above the reservoir are currently habitat only for resident and adfluvial fish (fish that migrate from the reservoir to spawn in streams). ODFW presence/absence surveys were performed in the watershed in 1999 and included the streams within the planning area (ODFW 1999b). These surveys documented rainbow and coastal cutthroat trout (*Oncorhynchus clarkii clarkii*) as well as sculpin. Non-native fish, including bass, crappie, yellow perch, and bullheads have also established in the reservoir and potentially access lower portions of Emigrant Creek within the planning area. Most of the mainstems of Sampson and Emigrant Creeks are on private lands. Walker Creek, which is entirely located on private lands, remains accessible to anadromous fish and is known to provide habitat for steelhead. Its lower gradient reaches near the confluence with Bear Creek are also accessible to Coho salmon, though they have not been documented. Emigrant Creek drains the Cascade/Siskiyou crest and flows north, while Sampson and Walker Creeks drain the Cascade foothills and flow west.

Water is diverted from Keene Creek Reservoir in the Jenny Creek Watershed to Emigrant Creek to generate power at a small power plant located on Emigrant Creek, and to help augment water levels in Emigrant Reservoir, which is used to supply water to the Rogue Valley. During flood periods, excess water is spilled down Schoolhouse Creek, a small Tyler Creek tributary, which has in the past resulted in excessive erosion and scouring to bedrock the channels of Schoolhouse and Tyler Creek. Tyler Creek is relatively high gradient as it flows constrained within a steep canyon. Numerous small falls and cascades are present, and bedrock is a common component of the stream-bed substrate. For these reasons fish use is limited only to a short reach of Tyler Creek. Riparian vegetation is largely hardwoods, as the surrounding landscape is primarily oak woodland.

Sampson Creek has primarily been impacted by grazing. Much of the sub-watershed was historically utilized by a private ranch and it was intensively grazed for many years. ODFW stream surveyors noted high amounts of silt in reaches of Sampson Creek, though they also noted that there were fences to preclude cattle from many areas. There have been several small landslides that have occurred near the headwaters of Sampson Creek, and the upper channel exhibits evidence of past debris torrents scouring out the channel. These events may have resulted in the transport of sediment to downstream fish bearing reaches. ODFW surveyors also

noted that other than the high sediment levels observed, instream and riparian habitat in Sampson Creek was generally in good condition, with deep pools and large wood present in sufficient quantities to provide ample cover and spawning and rearing habitat for trout and other aquatic species. The stream channel is low to moderate gradient for many miles above its confluence, and therefore accessible to trout for a considerable distance upstream of the reservoir. Lower reaches of Sampson Creek flow through oak woodlands, while upper reaches are forested. There are meadows and numerous springs in the headwater areas.

Emigrant Creek and its tributaries make up the largest drainage area within the planning area in the Bear Creek Watershed. Emigrant flows through oak woodlands in its lower reaches and mature conifer forest in its upper half. The tributaries found above the Tyler Creek confluence are also in forested terrain. Habitat in these upper areas, which include stream reaches on BLM managed lands, was found to be good for aquatic organisms by ODFW surveyors in 1999 in Emigrant and its tributaries. Broadly speaking, habitat can be described as moderate gradient through much of the streams' respective lengths, pools formed by large wood were abundant, substrate was largely dominated by boulders, cobbles, and gravels, and fish numbers were found to be high. Pacific giant salamanders were commonly encountered in many of the streams. Mature conifers provide ample shade to these streams. The area has high road densities, a result of past timber management on both BLM and private lands. Some limited road decommissioning has occurred in the sub-watershed, but road densities are still relatively high in Emigrant Creek. Like other watersheds in the planning area, the long-term drought has probably had the biggest impact on aquatic habitat in the planning area; Emigrant Creek was observed to be dry at its confluence with Emigrant Reservoir during the late fall of 2022. During this same period Emigrant Lake was only filled to 2-3 percent of capacity, a historically low level.

Little Butte Creek Watershed

The Little Butte Creek Watershed is a very large watershed that makes up one of the larger tributaries to the Upper Rogue River Subbasin. Very little of the watershed (less than 3 percent) is in the planning area, which includes only headwater areas of Antelope Creek on the north side of Grizzly Peak, the top of Latgawa Creek, a very small portion of land that includes headwater areas of Conde Creek, and one section that includes 1 mile of upper Lost Creek. All these areas are well upstream of anadromy. Both Latgawa and Lost Creek are trout-bearing streams, providing habitat for native rainbow and cutthroat trout. Introduced brook trout (*Salvelinus fontinalis*) are present in both of these streams as well. Latgawa Creek also has a population of speckled dace. The streams are very different in nature. Latgawa Creek flows through numerous wet meadows, with willow, spirea, and aspen dominating the riparian vegetation in these areas. The topography is very gentle, and numerous reaches exhibit high sinuosity and evidence of historic channel braiding. These areas were historically prime beaver habitat, and old beaver chewed trees can still be found here. Grazing has led to notable impacts to aquatic habitats in Latgawa Creek. Many of the meadow reaches were degraded due to browsing of riparian vegetation and bank trampling, and over time many of these reaches have become incised and no longer connected to their adjacent flood plains, resulting in less water storage and subsequent release, reducing stream flows during the summer months. Beaver habitat was also reduced, and trapping of beaver, which continues at present, resulted in reduced populations of these species which provided essential ecosystem services that created and maintained many important features of aquatic habitat, most notably by maintaining aggraded channels connected with their

floodplains and enabling floodplain inundation and water storage. Exclosure fencing and the elimination of grazing on BLM lands in this portion of the planning area have ameliorated some of these impacts, as riparian vegetation has begun to recover. However, the channels in many areas remain incised and disconnected from their floodplains, and cattle from other areas do still occasionally find their way into the exclosure area via gates left open or through compromised fences. Much of Latgawa Creeks water is periodically diverted out of the watershed just downstream of the decision area, where a diversion transfers water to Howard Prairie Reservoir.

The section of the planning area that includes Lost Creek as it flows through a mature forested stand includes two unique aquatic features: Lost Creek falls, consisting of two waterfalls, approximately 30 feet tall, over bedrock; and downstream of these falls, Lost Lake, formed by an old landslide that plugged the canyon. Fish have been documented above the falls. Riparian vegetation is primarily large conifers, many of which have fallen into the stream over time, adding numerous pieces of large wood. Aquatic habitat in this section is of high quality, and includes ample cover and abundant scour pools, and is well shaded by the large conifers in the riparian area. This section is relatively remote and difficult to access, and as such little anthropogenic disturbance has occurred. Lost Lake gets limited fishing pressure. The trout population in the lake appears to be predominated by non-native brook trout. The lake is also important habitat for other aquatic species, including western pond turtles which have been observed there. This section is within in an active allotment, but the steep topography and dense vegetation appears to serve to limit access to Lost Creek and Lost Lake by cattle.

Planning area portions that include small parcels within the Antelope and Conde Creek drainages do not include fish bearing streams. Like other watersheds within the planning area, the ongoing drought is impacting water quality and quantity in the watershed area streams.

6.5.2 Trends

Fish Populations

Fish populations are not static and vary from year to year in response to numerous variables such as flood and droughts, which may impact breeding success and recruitment, and growth and survival rates. Variation in population size is therefore normal even in the absence of anthropogenetic stresses. For this reason, long periods of time must be looked at to determine trends. There is little long-term data available to describe trends in fish populations in most areas within the planning area, with the exception of Jenny Creek, which has been studied for many decades due to the presence of the unique population of suckers found there.

A rigorous population estimate was conducted for Jenny Creek Suckers in 1981 (Hohler 1981) and in 2015 by BLM staff using electrofishing equipment to capture fish from numerous reaches throughout all areas of the watershed accessible to suckers (USDI BLM 2015). Similar stream reaches were snorkel-surveyed by BLM staff in several years between the electrofishing efforts. While these survey methods were not all conducted for the same purposes, and they have different biases, they do allow for comparison of a like metric, fish/unit area, and thus can suggest population trends over the years. The data shows that in any given year there has been considerable variation in sucker density, but that over the period spanning almost 4 decades the population trend line, though very slightly negative, has been relatively stable (**Figure 6-3**). The data set does not include recent years, and therefore may not capture recent effects of the

drought, which has intensified in the past five years or so and which may have resulted in impacts to the sucker population after the last comprehensive sucker surveys were conducted.

A parasite, *Ligula instesinalis*, was documented in Jenny Creek Sucker and Speckled Dace individuals in 2013. The parasite requires three hosts to complete its lifecycle, with fish serving as the intermediate host. The parasite must pass through the gut of a bird to complete its lifecycle. The parasite changes infected fish's behavior to become more susceptible to predation by birds. Even if not eaten and thus killed directly by the bird, the presence of the parasite can affect the health and fecundity of infected fish. It is unknown if the parasite was recently introduced to the watershed or has been present for many years. Infected fish are easily distinguished by their distended gut caused by the parasite in its later stages of infection, suggesting that earlier survey efforts should have encountered and noted infected fish. The parasite may have been introduced to the watershed by illegal use of baitfish; members of the fish family *cyprinidae* (minnows) are one of the common host species of the parasite, and minnows, such as golden shiner are commonly used as baitfish and are present in the watershed. Trout are not a host species for the parasite. It is unknown if the presence of *Ligula intestinalis* would pose a significant risk to Jenny Creek suckers. As of 2015, infection rates appeared to be relatively low, with infected fish making up a very small percentage of all fish handled during tagging and fish population efforts.

There has been less effort focused on trout populations in Jenny Creek, but they were counted during snorkel surveys conducted for Jenny Creek suckers. The most complete data sets from these efforts are available for a reach of Keene Creek and a reach of upper Jenny Creek in the Fredenburg Springs area which have been surveyed numerous times. Counts of trout in these reaches show an obvious upward trend in Keene Creek, and fluctuating numbers between years for upper Jenny, but still with an upward trend (**Figure 6-4**). Data does not include recent years so potential effects which may have occurred to these populations as a result of the intensifying drought may not be captured.

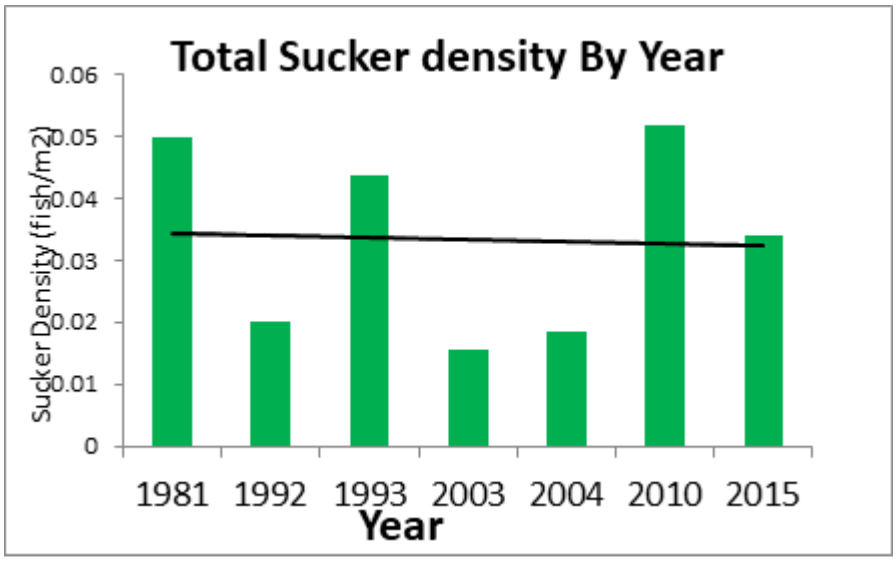

Figure 6-3. Sucker population trends

Based on Hohler (1981) and USDI BLM (2015) population estimate and snorkel surveys

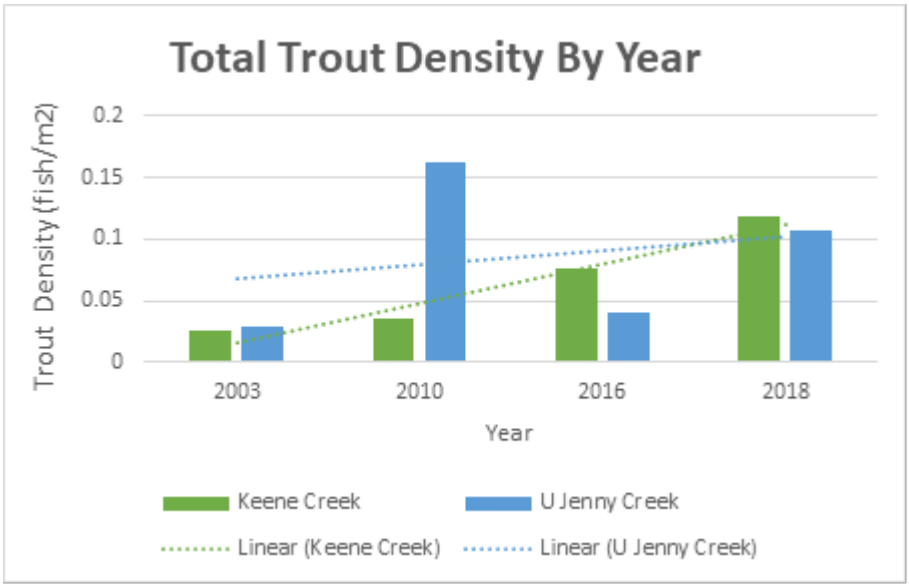

Figure 6-4. Trout population trends in Upper Jenny and Keene creeks

Based on BLM snorkel surveys

Data are not available to quantitatively describe trends in of other populations outside of Jenny Creek. It has been observed that many streams have less water in them in recent years due to the ongoing drought, and some reaches are no longer perennial. This has resulted in at least seasonal habitat contraction, reducing both the space and time frame available for fish and other aquatic life during periods of low flow, and very likely has led to population declines, and perhaps local extirpations. Some areas are more at risk to localized extirpations than others. Populations near habitats that provide refugia from desiccation or poor water quality associated with very low flow during the hot summer months are more resilient, as they can more easily be recolonized. Much of the Jenny Creek Watershed is an example of such an area. For example, even though Keene Creek above Little Hyatt Reservoir may be desiccated for periods, fish can take refugia in Little Hyatt Reservoir, and re-colonize Keene Creek when water is allowed to flow from Hyatt Reservoir again. The steep headwater streams that include populations of trout, such as those found in the Soda Mountain Wilderness portion of the Klamath Iron Gate Watershed (Scotch, Camp, Dutchoven and Slide Creeks) are located far from other source populations located well downstream and at much lower elevation in the Klamath River. Were these streams to completely dry, it may take many years under the right conditions (numerous high-water years with no annual desiccation of reaches) for fish to re-colonize these areas.

Aquatic Habitat

Like fish populations, much of the habitat within the planning area has not been quantitatively assessed, or, if it was, was only surveyed once, making quantitative trend analysis difficult. Qualitatively speaking, aquatic habitat is trending upwards within the planning area, with the

very notable exception of drought and its impacts to water quantity and quality (stream temperature). Water is declining throughout the area (see Section 6.8). While drought years are not unusual for the region, the duration and severity of the recent drought is notable, and it has intensified in recent years. Precipitation and snowpack deficits in the region have become more common of late, and water available for aquatic habitats and species has been trending downward. This has led to consecutive years where area reservoirs did not fill to capacity and were depleted to historic low levels at the end of the season. Reservoir levels were so low that the ODFW enacted emergency regulations and eliminated harvest limits and ceased stocking of fish in some of the area reservoirs in recent years. Lotic habitats have followed a similar trend, with declining water, particularly acute during the late summer and into early fall. Air temperatures are trending higher across the region, along with stream temperatures in many monitored reaches. This trend includes a long-term reference reach (Dutch Oven Creek) that has not been impacted by management practices (see hydrology discussion). Notable exceptions have been observed in some restored stream reaches, such as the former Box O ranch segment of Jenny Creek, where water temperatures have trended lower due to the recovery of riparian vegetation. Duration of wetted stream flow has also declined, and some reaches that were historically perennial have trended to seasonal or interrupted (stream continuity broken by dry reaches). These trends are obviously correlated with high consequences for aquatic organisms, as they represent both a contraction of suitable habitat, and decline in quality of remaining habitat.

Other aquatic habitat indicators are improving, largely a result of improved management practices that included establishment of the Riparian Reserves, reduction of cattle grazing impacts, and active restoration. As riparian vegetation has begun to recover within the Riparian Reserves, channel shade has generally been observed to be trending upwards, as has bank stability, with declines in sediment delivery coinciding with these trends. Numerous instream and watershed restoration activities have been undertaken to improve instream and riparian habitat and reduce erosion and sediment transport to aquatic habitat. Recent large wildfires have impacted certain areas, resulting in both negative and beneficial effects. Where overstory shade was eliminated by fires, such as in areas adjacent to Fall Creek, water quality, particularly temperature, may have trended downward. These same areas can be expected to benefit from increased wood recruitment, as fire killed trees fall into channels. The negative trends resulting from fire are of little consequence relative to declining water availability, which is currently the trend that poses the greatest threat to aquatic habitat and the organisms that depend on them.

6.5.3 Forecasts

Fish Populations and Aquatic Habitat

The Irongate, Copco 1 and 2, and John C Boyle Dams on the mainstem of the Klamath River are scheduled for removal, starting with the smallest, Copco 2 in the summer of 2023. The remainder are projected to be removed by the end of 2024. This would allow unhindered access to many areas in the upper Klamath Basin by anadromous fish. However, within the planning area, relatively few new stream miles would be accessible, as most of the streams either have natural impassable barriers, such as the falls located on lower Jenny and Fall Creeks or are too high gradient or too small to be suitable to anadromous fish. The lower reach of Scotch Creek may provide some habitat for anadromous fish, but this reach is on private lands, and not within the planning area. Jenny Creek below the falls would also likely be used as spawning and rearing

habitat by anadromous fish, and perhaps even by fall Chinook Salmon *(Oncorhynchus tshawytscha*), which may be the species best suited to take advantage of this newly accessible reach, as their young do not require a long period of fresh-water residency. Water temperatures in lower Jenny Creek are warm; a 7-day maximum temperature of 74.3 degrees was documented in 1998 (USDI BLM 1998), which is well above preferred limits for most coldwater species. Water temperatures have likely trended higher in this reach since 1998 given reduced stream flows and recent record-breaking heat waves which have impacted the region. This would limit the quality of rearing habitat for species which rear in fresh water for a year or more, which include Coho, Steelhead, and lamprey. Spencer Creek offers many miles of suitable habitat and would likely become an important spawning and rearing stream for anadromous fish. There is a small possibility that Steelhead, typically the furthest ranging upstream of the anadromous fish, could make it as far upstream as Tunnel Creek within the planning area (personal communication with Roninger R, Klamath Falls Field Office Fish Biologist, January 27, 2023).

No changes to water management are forecasted; the reservoirs in the planning area that store and divert water would remain and continue to operate through the foreseeable future. Cattle grazing is likely to continue on lands authorized for it similar as present, and it is anticipated that exclosure fences would continue to be pressured by cattle from outside areas. Active aquatic restoration is forecasted to continue, though the rate and nature of activities may change to better address limiting factors (water quantity and quality). It is anticipated that a greater emphasis would be placed on projects that promote floodplain connectivity and water storage, beaver habitat, and perhaps protection of beaver populations, though these populations are managed by the states and changes in management can only be imparted by the respective state agencies that manage them. There have been recent efforts in the Oregon legislature to acknowledge the ecosystem services that beaver provide, though they have yet to result in legislation that would afford more protection of beaver populations. However, there is a growing movement and awareness of the importance these animals provide to aquatic habitats. For example, the ODFW in 2020 received a petition to ban trapping of beaver on federal lands. The Commission denied this request but did direct the agency to conduct further analysis and to provide information on beaver management, specifically in the context of climate change and benefits to water availability and aquatic organisms. Stated objectives that resulted from this effort notably included maximizing beaver modified floodplain landscapes and ecosystem benefits on public lands (Kearns and West 2022). Should these objectives ever be implemented with meaningful management actions, such as restricting trapping in areas, this could result in improved aquatic habitat with increased resilience to forecasted climate trends. If increased efforts were undertaken to reduce fuel loads and departures in vegetation, this could lead to increased fire resilience in the area, which would also be beneficial to the watersheds. Conversely, lack of these treatments may lead to a forest stands that are less resilient in the face of forecasted increased fire severity, which would be anticipated to result in increased erosion and sediment transport to aquatic habitat, increased losses of riparian vegetation, and increased solar exposure and water temperatures.

For most of the fish and aquatic organism populations within the planning area, the forecast of most importance is related to climate change and precipitation patterns, and their impacts to water availability, particularly during the most critical low flow portion of the season in late summer. Climate change forecasts for the region from the Climate Change Vulnerability and Adaptation in SW Oregon report (Halofsky et al. 2022) predict that recent observed trends would

continue and worsen. Increasing air and stream temperatures, lowering summer stream flows, and resulting decreases in native coldwater fish species abundance and distribution are all forecasted in the report. Summer base flows are forecasted to decline up to 30% in the coming decades. This would coincide with warming water temperatures, which would favor non-native species, and suggesting that introduced aquatic species would increasingly interact negatively with native species at the same time as their habitat is contracting. The report also predicts greater winter and/or spring peak flows, and different timing of these flows, particularly in watersheds such as Jenny Creek, which include large drainage areas in the mid-to high elevations of the Cascades. Increased peak flows could lead to increases in erosion and sediment transport to aquatic habitats during these events. Areas draining the higher elevations of the cascades may be less sensitive to changes in timing of flow, but remain sensitive to declines in absolute flow, particularly during times of depressed precipitation, such as the planning area is currently experiencing. Aquatic invertebrate populations, which are a major food source for many aquatic organisms, are also predicted to be affected, as are amphibians. Increased frequency and severity of wildfire could result in reductions of riparian cover, which could exacerbate stream temperature warming. Riparian plant communities may shift to more drought tolerant species, especially adjacent to stream reaches that change from perennial to intermittent in response to declining stream flows. Lentic systems are also forecasted to be negatively impacted by climate change, with notable impacts including less surface water, increased water temperatures, and reduced distribution and abundance of the aquatic species that inhabit these types of systems. Some wetlands may completely dry out in the summer, while some that are currently perennially wet may become only seasonally wet.

6.6 GEOLOGY AND PALEONTOLOGY

Proclamations 7318 and 9564 identified the following geological objects of scientific and historic interest to protect in the CSNM: the tectonic actions and convergence that created the land bridge between the Klamath, Siskiyou, and Cascade mountain ranges, expressed by the Siskiyou Summit Fault; diverse volcanic lithologies and soils; Pilot Rock, a remnant of a volcanic plug; Grizzly Peak, a large stratovolcano with lava flows, spatter cones, and older tuffs; Old Baldy, a shield volcano with a series of dikes; and Surveyor Mountain, which represents the far western boundary of the Basin and Range Province.

6.6.1 Current Conditions

The planning area is primarily within the Cascade Mountain Range. The Cascade Mountain Range is comprised of a wide variety of continental volcanic rocks. This volcanic province is divided into two distinct north-south belts: the older Western Cascades and the younger High Cascades. The western edge of the planning area is a part of the much older Klamath Mountain geologic province.

The rocks of the Western Cascade Range began erupting around 40 million years ago, and stopped about 10 million years ago (Orr, Orr, and Baldwin 1992). During this time the coastline in Oregon ran northwest through the region of the Willamette Valley. The volcanoes of the Western Cascade Range were created by the subduction of the Farallon plate beneath the North American crustal plate. This movement of enormous crustal plates triggered intense volcanic activity.

The Western Cascades in this area are primarily composed of the Colestine, Roxy, Wasson, and Heppsie Formations (D'Allura 2017). They are approximately 16,500 feet thick and form a stratigraphically complex sequence of continental volcanic, volcaniclastic, and sedimentary rocks (Smith et al. 1982). They vary from basalt to basaltic andesite to andesite in composition. There are numerous tuffaceous, pyroclastic, and sedimentary interbeds. During this volcanism the region was subjected to many intrusions of mafic to felsic dikes, sills, plugs, and stocks. The Colestine Formation is at the base of the Western Cascades. This formation contains ash flow tuff, some of which contain fossil leaves, cones, and plant fragments. Some of these fossiliferous outcrops are near Pilot Rock. When this rock was being deposited the region was lower in elevation than it is today and considerably warmer. The beautifully preserved Oligocene plant fossils of metasequoia, sycamore, ferns and more are found within this fine grained, white tuff (Orr and Orr 1981).

One of the most striking features of the Western Cascades in this area is Pilot Rock, located near the southern boundary of the planning area (**Figure 6-5**). It is a volcanic plug – the feeder vent to a now eroded volcano. It is an outstanding example of the "inside" of a volcano. Pilot Rock has sheer, vertical faces up to four hundred feet above its base on a talus slop. It has classic columnar jointing caused by cooling of the hornblende andesite that makes up Pilot Rock. The interpretative signs at the Pilot Rock trailhead highlight the geology of Pilot Rock.

Figure 6-5. Pilot Rock

Other notable geologic features within the Western Cascades include the lava flows of Soda Mountain, Hobart Bluff (a large intrusive body), Grizzly Peak (a remnant shield volcano shown in **Figure 6-6**), and Parsnip Lakes and Lost Lake (formed from the damming of landslide deposits) (D'Allura 2017; Cooke and D'Allura 2020). Agate Flat is a unique flat table land toward the southeastern portion of the planning area. This area has been a popular area for rock hounds to collect agate, jasper, and petrified wood.

Figure 6-6. Grizzly Peak and foothills near Ashland, Oregon

There was a period of no volcanic activity in the region from about four to five million years ago. It was during this time that the Western Cascade Range was uplifted, tilted eastward, and further eroded. These rocks form an east to northeast dipping homoclinal sequence with dips ranging from 5 to 30 degrees (Smith et al. 1982). Erosion, assisted by subtropical climates, stripped the material from the volcanoes and redeposited it (Orr, Orr, and Baldwin 1992). The drainage patterns in the area are deeply dissected and well-developed in response to landslides and surface erosion.

The eastern portion of the planning area are made up mostly of the High Cascade Range. This range, which started erupting about 4 million years ago and continues at present, virtually buried the severely eroded Western Cascades. The first eruptions of the High Cascades were shield volcanoes and cinder cones. Later, the High Cascades produced a variety of lavas and tuffs, dominated by basalts, which were erupted from a number of composite cones (Orr, Orr, and Baldwin 1992).

Keene Creek and Jenny Creek roughly follow the contact of the High Cascades and the Western Cascades. Chinquapin Mountain, Little Chinquapin Mountain, and Old Baldy are a part of the High Cascades. These younger High Cascade shield volcanoes are just a few of the many shield volcanoes responsible for the present-day topography of the eastern portion of the planning area. Vulture Rock, a remnant volcanic vent, is another unique and distinct geologic feature among the High Cascade landscape (D'Allura 2017; D'Allura et al. 2021).

At the far eastern portion of the planning area among the High Cascade Range is Surveyor Mountain, the highest point in the planning area. Surveyor Mountain is a remnant shield volcano. The ridge displays partially preserved dikes and eruptive vent material. Surveyor Mountain is a significant feature as it also among the Surveyor Mountain fault zone and represents the westernmost extension of the vast Basin and Range geologic province, which extends from Surveyor Mountain to Salt Lake City in Utah (D'Allura et al. 2021).

A unique feature of the planning area is the proximity of the Klamath Mountains to the Cascade Range. A small portion of the southwestern area of the planning area is a part of these much older rocks. The Klamath Mountains are made up of seven different exotic terranes that were once parts of the ocean crust or island archipelago environments. Formed in an ocean setting, these tectonic slices were carried toward the North American land mass via plate tectonics. Upon arrival they were accreted to the existing continent, folded and faulted.

The Klamath Mountains were later intruded by granitic rocks (Orr, Orr, and Baldwin 1992). One of these intrusions is the granitoid Ashland Pluton, which is age dated at 167 to 148 million years old (D'Allura 1997). Mt. Ashland is overlain non-conformably by the late Cretaceous Hornbrook Formation (135 to 65 million years. It is sedimentary sands, muds, silts, and volcanic material that formed in a shallow inland sea. Well-preserved bottom dwelling clams, snails, and cephalopods can be found as fossils and represent shallow water continental shelf conditions. The Hornbrook Formation is overlain by continental conglomerate and sandstone stream deposits of the Eocene Payne Cliffs Formation (40-50 million years) (D'Allura 2017). Small portions at the western edge of the planning area occur within the Ashland Pluton, Hornbrook Formation, and Payne Cliffs Formation.

The much older Klamath Mountains are adjacent to the Cascade Range near the Siskiyou Summit area. At one time, the Bear Creek Valley and the Colestine Valley were joined but, over time, the Siskiyou Summit fault was uplifted and created a mountain pass where the valley once was. The Siskiyou Summit fault is one of the most significant faults in Oregon and has moved thousands of feet (personal communication with Elliot M, Department of Geology, Southern Oregon University, 1991). The Siskiyou Summit fault occurs in the southwestern portion of the planning area at the edge of the Mt. Ashland pluton. At the Siskiyou Pass area these two geologically distinct mountain ranges meet.

6.6.2 Trends

Visitor use is increasing in the planning area. The BLM has recorded a 22 percent increase at 25 recreation sites in the planning area over the last 10 years. Increased visitor use may increase the probability of unique or significant geologic features and materials being affected.

The working relationship with major partner Friends of the CSNM has been stable over the years. The BLM and Friends of the CSNM has worked with Jad D'Allura, Geologist and Professor, since 2016. D'Allura continues to extensively research and map the CSNM geology. Friends of the CSNM has released a lecture series on their website and YouTube channel named "Inspiring Connections with Nature," which features D'Allura's years of geologic research in the CSNM in a lecture titled Volcanic Rock'n and Roll'n in the CSNM.

6.6.3 Forecasts

Geological features that may need protection and enhancement include Pilot Rock, Siskiyou Summit Fault, Hobart Bluff, Grizzly Peak, Old Baldy, Vulture Rock, Surveyor Mountain fault zone, Parsnip Lakes, and Lost Lake. Other special geological features include lava ramparts, large sail-like dikes, thick breccia sequences, and spatter cones. Areas of high use include Pilot Rock, Hobart Bluff, and Grizzly Peak.

Ongoing geologic mapping would continue to make invaluable contributions to the understanding of the earth's past. Given the general trend of current geologic research and visitor use, the number of scientific publications would increase and public enjoyment and understanding of the unique nature of the resource should increase. CSNM-specific geologic maps, documents, and interpretive signs would help advance scientific goals and resource protection, preservation, and conservation. Geologic outreach efforts should also help counter looting and vandalism and lead to greater citizen stewardship.

6.7 HYDROLOGY (GROUNDWATER, SURFACE WATER, WETLANDS, RIPARIAN AREAS, FLOODPLAINS, AND WATER QUALITY)

6.7.1 Current Conditions

Surface Water

The planning area is located in the Klamath and Rogue River basins and seven watersheds: Spencer Creek, Jenny Creek, Klamath-Iron Gate, Cottonwood Creek, Bogus Creek, Little Butte Creek, and Bear Creek. **Table 6-4** displays hydrologic units that fall partially or completely within the planning area.

Table 6-4. Hydrologic units within the planning area

Hydrologic Units	Hydrologic Unit Code	Acres Within Planning Area		Stream Miles Within Planning Area	
		BLM	Total	BLM	Total
Rogue River Basin					
Middle Rogue Subbasin	17100308			174.1	440.6
Bear Creek Watershed	1710030801	20,029	111,493	174.1	440.6
Upper Rogue Subbasin	17100307			49.2	82.4
Little Butte Creek Watershed	1710030708	7,122	238,881	49.2	82.4
Klamath River Basin					
Upper Klamath Subbasin	18010206	86,353	571,913	500.4	738.3
Spencer Creek Watershed	1801020601	2,572	100,371	5.2	5.2
Jenny Creek Watershed	1801020604	60,297	134,462	356.7	515.6
Klamath-Iron Gate Watershed	1801020606	16,964	42,270	107.6	141.1
Cottonwood Creek Watershed	1801020606	5,885	63,561	26.3	63.6
Bogus Creek Watershed	1801020607	635	231,249	4.6	12.8

Based on USDI BLM (2022a)

Natural lakes in the Monument area include Hobart Lake in the Upper Emigrant Creek Subwatershed, Big Lake in the Walker Creek Subwatershed, Parsnip Lakes in the Keene Creek Subwatershed, Lost Lake in the Lower South Fork Little Butte Creek Subwatershed, and an unnamed lake/pond in the Buck Lake Subwatershed. Large reservoirs within the planning area include the small southern and eastern portions of Howard Prairie Reservoir in the Upper Jenny Creek Subwatershed, and the southern portion of Hyatt Lake Reservoir and Keene Creek Reservoir, both in the Keene Creek Subwatershed. There are three major reservoirs just outside the Monument boundary: Emigrant Lake in the Lower Emigrant Creek Subwatershed, Iron Gate Reservoir in the Klamath-Iron Gate Watershed, and Howard Prairie Lake (mostly outside the CSNM) in the Upper Jenny Creek Subwatershed. Hyatt, Howard Prairie, and Emigrant reservoirs are managed and operated by the Bureau of Reclamation and the Talent Irrigation District. Hyatt, Howard Prairie, and Emigrant reservoirs are operated primarily for irrigation in the Bear Creek Watershed, with additional benefits of hydroelectric production and recreation opportunities. Keene Creek Reservoir provides temporary storage for releases from Howard Prairie Lake (via canal) and Hyatt Lake (via Keene Creek). Water is diverted from the Keene Creek Reservoir via canal and penstock to the Green Springs Power Plant located on Emigrant Creek approximately two miles above Emigrant Lake. Iron Gate Reservoir is owned and operated by PacifiCorp as a re-regulating reservoir to offset peak flows that are discharged from two hydroelectric projects upstream of Iron Gate. It also produces electricity but has no flood control benefits. Many small reservoirs used for livestock watering, irrigation, and forest management activities are located throughout the planning area.

There are numerous springs in the planning area. The largest spring in the planning area is Shoat Spring in the Lower Jenny Creek Subwatershed. This spring forms Spring Creek, a tributary to Jenny Creek, from which 10 cubic feet per second (cfs) of water is diverted and transported to Fall Creek to operate a PacifiCorp hydroelectric plant. The municipal water rights for 15 cfs from Fall Creek are held by the City of Yreka which diverts the water into a pipeline before it reaches Iron Gate Reservoir (USDI BLM 2005). Most wetland features on the Medford District Office lands of the planning area have been field verified by BLM to determine their extent. The remainder of wetlands within the planning area have been identified by BLM using aerial photos.

Stream miles in the planning area are shown in **Table 6-3**. The BLM inventoried streams in the Jenny Creek, Little Butte Creek, and Bear Creek watersheds from 1999 to 2008, during the summer field season (USDI BLM 1998-2008). Perennial and intermittent stream classification was determined from aerial photos for the Klamath-Iron Gate Watershed for the development of the Klamath-Iron Gate Watershed Analysis (USDI BLM 2000a). Aerial photos were also used for the classification of streams across all ownerships in the Cottonwood and Bogus Creek watersheds during the update of the National Hydrography dataset by BLM hydrology staff from 2002-2004. Most stream miles within the planning area are intermittent. Data collection and analysis efforts are funded for the CSNM RMP in summer of 2023 using the USGS FlowPer model. This data collection platform and model would update existing information throughout the planning area on streamflow permanence.

Water Quantity

There are no continuous streamflow-monitoring stations on non-regulated (natural flowing) streams within the planning area. Unregulated streamflows in the planning area fluctuate with

seasonal variation of precipitation. Moderate to high flows generally occur from mid-November through May. Streamflows during the months of March, April, May, and part of June are augmented by melting snowpack in high elevations. Low flows normally coincide with the period of low precipitation from July through October. The BLM installed a streamflow gaging station on Jenny Creek (regulated by Hyatt and Howard Prairie Reservoirs) downstream of the former Box O Ranch in the fall of 1997 and it became fully operational in the fall of 1999. Average monthly streamflows during the period of record (1999-2022) range from 11 cubic feet per second (cfs) in August to 205 cfs in March (USDI BLM 2022b).

Peak streamflows in the planning area are a result of a combination of natural and human caused factors. Natural factors contributing to peak flows include high intensity storms, snow melt, rain-on-snow events, and severe extensive wildfires. Human influences having the potential to increase peak flow magnitudes above natural conditions include road construction, timber harvest, land clearing, fire suppression, and reservoirs. High road densities that may contribute to increased peak flow magnitudes are a concern in portions of the planning area within the Jenny Creek, Bear Creek, and Little Butte Watersheds and the Fall Creek Subwatershed within the Klamath-Iron Gate Watershed. Timber harvest and land clearing in the Jenny Creek and Bear Creek watersheds have decreased canopy closure and increased transient snow openings to an extent that they are likely to contribute to increased peak flow magnitudes in some drainages. The fire suppression policy of the past century has resulted in a build-up of unnatural fuel loadings, high vegetation density, and a change to fire-prone vegetative conditions. These conditions contribute to the planning area being highly susceptible to a catastrophic wildfire. The high intensity fire produced by catastrophic wildfire would severely damage soils over large areas and destroy the vegetative cover, including riparian vegetation. Vegetative and soil conditions resulting from a catastrophic wildfire would likely cause a substantial increase in peak flow magnitudes and decrease the time to peak. Direct interception of precipitation by the reservoir surfaces in the Jenny Creek Watershed result in instant delivery of precipitation into the stream system which affects the timing and magnitude of peak flows.

Augmentation and diversion of flows in the Jenny Creek watershed for purposes of irrigation and hydroelectric production in the Bear Creek Watershed greatly complicate the instream flow regime for Jenny and Keene Creeks within the planning area. Howard Prairie Lake receives water that is diverted from South Fork Little Butte Creek and its tributaries (in the Little Butte Creek Watershed to the north of Jenny Creek Watershed). Water diversions from Hyatt and Howard Prairie reservoirs, from Soda and Beaver Creeks by Talent Irrigation District (TID), and from Spring Creek by PaciCorp export approximately 30,000 acre-feet of water annually from the Jenny Creek Watershed (USDI BLM 1995b). This quantity represents 28% of the estimated total runoff that would otherwise be available to support the basin's aquatic organism populations (USDI BLM 1995b). Stream systems that have significant increases in summer flows due to augmentation include Fall, upper Keene, Tyler, and Emigrant Creeks. Reservoirs in the Jenny Creek Watershed are not managed for flood control and consequently, the reservoirs may reach full pool early in the water year. When this occurs, peak flows may approximate pre-dam conditions as surplus reservoir water enters the stream system.

The lowest streamflows in the planning area occur during the summer due to both natural and human-caused factors. Natural factors affecting summer flows include low summer rainfall and sustained high evapotranspiration. Summer streamflows in Jenny Creek Watershed are highly

influenced by human-caused factors such as water withdrawals, reservoir storage, and interbasin transfers. Low summer flows in the other areas of the human-caused factors affecting low summer flows include riparian vegetation removal resulting from timber harvest, improper livestock grazing, or residential/agricultural clearing. Loss of riparian vegetation can lead to channel widening, channel aggradation, or lower of the water table (Platts 1991). Channels that become wider and shallower have an increased stream surface area that can be heated up and lost to evaporation and more efficiently drain the adjacent floodplains. Lower water tables signify that less water is moving into the stream channel and thus there would be subsequent reduction in low flows.

There are two existing instream water rights within the planning area. The first was filed with a priority date of October 26, 1990, by Oregon Department of Fish and Wildlife (ODFW) for Jenny Creek from Johnson Creek to Keene Creek to benefit resident fish rearing. This instream right varies by month, from 4 to 16 cfs (OWRD 2000). The second instream water right was filed by BLM in cooperation with the Oregon Water Trust to transfer irrigation rights for the Box O Ranch to instream use for the enhancement of aquatic and fish life and water quality. The original water rights for the Box O Ranch had priority dates from 1890 to 1955, totaling 3.67 cfs (USDI BLM 1995b).

The Oregon Water Resources Department is currently conducting an Oregon general stream adjudication for surface waters in the Klamath River Basin. An adjudication is the Oregon statutory process for quantification and determination of all rights to water, the use of which was initiated before February 24, 1909, and federal reserved water rights, including the rights of Indian tribes and their members. The Klamath Adjudication is the first Oregon general stream adjudication in which complex federal claims have been filed. Prior to the designation of the CSNM, the BLM filed claims in 1997 for federal reserved water rights under Public Water Reserve 107 for 33 springs in the geographic area of the original CSNM. However, since the period for filing claims ended before the designation, water rights for purposes of the CSNM are not included in the ongoing adjudication. The first phase was the review and determination of these claims by the Oregon Water Resource Department. This phase was completed on March 7, 2013, with the issuance of the Adjudicator's Findings of Fact and Final Order of Determination. The process is now in the second phase, which is the review of the Final Order of Determination by the courts.

The June 9, 2000, proclamation that established the Cascade-Siskiyou National Monument "reserved, as of the date of this proclamation and subject to valid existing rights, a quantity of water sufficient to fulfill the purposes for which this monument is established." This statement in the CSNM proclamation signifies that BLM has a federal reserved water right with a priority date of June 9, 2000, for an amount of water that is necessary to support the plant and animal species identified in the proclamation. The federal reserved water rights would include all water sources necessary to meet monument purposes, such as springs and instream flows. This applies to the expanded Monument as well, as identified by the statement "…*nothing in this proclamation shall be deemed to revoke any existing withdrawal, reservation, or appropriation*; *however, the monument shall be the dominant reservation*…" The BLM reserves the right to assert its federal reserved water rights established by the CSNM proclamations.

Both the Rogue Basin and the Klamath basin in Oregon are over-appropriated, meaning there are more surface water rights than there is available water. The Klamath Basin is closed to applications for new surface water rights. The Rogue Basin is not technically closed to new surface water right applications, but new junior water rights if approved, are only likely to be valid, or viable, in water years with exceptional surplus surface water.

Water Quality

The Clean Water Act requires states to identify designated uses of water bodies as a component of the water quality standards. The Oregon Department of Environmental Quality (ODEQ) has designated the following uses for the Bear Creek and Little Butte Creek watersheds: domestic water supply (municipal and private), industrial water supply, irrigation, livestock watering, anadromous fish passage, salmonid fish rearing, salmonid fish spawning, resident fish and aquatic life, wildlife and hunting, fishing boating, water contact recreation, aesthetics quality and hydropower (ODEQ 1992). The upper portion of the Klamath River Basin crosses from Oregon into California. The 1957 Klamath River Basin Compact between Oregon and California recognizes the following designated uses for the Jenny Creek, Klamath-Iron Gate, and Cottonwood Creek Watersheds: domestic water supply; livestock watering; irrigation; protection and enhancement of fish, wildlife, and recreation resources; industrial; hydroelectric power production; navigation; and flood prevention (OWRD 1997). Water quality standards are typically designed to protect the most sensitive designated uses within a waterbody. The most sensitive designated uses for the Monument are the protection and enhancement of fish resources, salmonid fish rearing and spawning, aquatic life, and domestic water supply. Temperature, dissolved oxygen, bacteria/pathogens, turbidity, and sedimentation are the key water quality indicators most critical to these sensitive beneficial uses.

The Oregon DEQ's 2022 list of water quality limited streams includes streams within the planning area as listed in **Table 6-5**. No streams in the Klamath-Iron Gate Watershed or Cottonwood Creek Watershed portions of the planning area are on the 303(d) list for Oregon or California. There are 14 parameters considered by ODEQ in the 303(d)-listing process. Only a small percentage of these 14 parameters have been assessed in the planning area to determine compliance with the State's criteria. No water quality monitoring has occurred in the planning area portion of Cottonwood Creek Watershed and only a limited amount of monitoring has been done in the planning area within the Klamath-Iron Gate Watershed.

Table 6-5. Water quality limited streams on the 303(d) list

Watershed	Stream Name	Description	Parameter
Upper Bear Creek	Carter Creek	Mouth to mile 3.8	Temperature-year round
	Emigrant Creek	Mouth to confluence with Porcupine Creek	Temperature-year round
	Tyler Creek	Mouth to confluence with Schoolhouse Creek	Temperature-year round
S. Fork Little Butte Creek	Lost Creek	Mouth to Lost Creek Falls (mile 8.1)	Temperature-year round; Sedimentation
Jenny Creek	Keene Creek	Mouth to confluence with South Fork Keene Creek	Temperature-year round
	Jenny Creek	Skookum Creek confluence to Howard Prairie Reservoir Dam	Temperature-year round
	Johnson Creek	Mouth to confluence with Green Creek	Temperature-year round

Based on ODEQ (2022)

Water Temperature

The Oregon and California State water quality criteria for temperature is established to protect resident fish and aquatic life, and salmonid fish spawning and rearing. The temperature standard for summer temperatures varies across the planning area based on designated fish use. In the Rogue River basin, the standard states that the seven-day moving average of the daily maximum shall not exceed 60.8°F in core cold-water habitat or 64.4°F in salmon and trout rearing/migration habitat. In the portion of the planning area in the Klamath River basin, the seven-day moving average shall not exceed 68.0°F in redband trout habitat. Streams in the planning area that are known to exceed the temperature standard are listed in **Table 6-5** as water quality limited for temperature.

Both natural and human-caused factors contribute to elevated stream temperature in the planning area. Natural factors that can affect stream temperature in the planning area include below normal precipitation and subsequent low summer streamflows, hot summer air temperatures, stream orientation, low gradient valley bottoms, and wildfires and floods that result in the loss of riparian vegetation. Human-caused disturbances that are likely to increase summer stream temperatures include water withdrawals, channel alterations that increase width-to-depth ratio, and riparian vegetation removal through logging, road building, improper livestock grazing, or residential clearing.

Dissolved Oxygen

Dissolved oxygen concentration refers to the amount of oxygen dissolved in water. Dissolved oxygen is critical to the biological community in the stream and to the breakdown of organic material (MacDonald et al. 1991). Dissolved oxygen concentrations are primarily related to water temperature; when water temperatures increase, oxygen concentrations decrease. (MacDonald et al. 1991).

Dissolved oxygen data is not available for the planning area, although it is likely to be a concern in streams with high temperatures.

Water Bacteria/Pathogens

Waterborne pathogens include bacteria, viruses, protozoa, and other microbes that can cause skin and respiratory ailments, gastroenteritis, and other illnesses. Bacterial contamination has little effect on aquatic organisms but is very significant to human use (MacDonald et al. 1991). Bacterial contamination of water bodies in the planning area could result from inadequate waste disposal by recreational users, and the presence of livestock or wild animals in springs/wetlands, stream channels, or riparian zones.

No bacteria/pathogen data is available for water bodies within the planning area.

Water Turbidity and Sedimentation

Sedimentation is the natural process of sediment entering a stream channel. However excessive fine sediments (sand-size and smaller) can cause problems such as turbidity (the presence of suspended solids) or embeddedness (buried gravels and cobbles). Sedimentation is generally associated with storm runoff and is highest during fall and winter.

The only stream in the planning area on the 303(d) list for sedimentation is Lost Creek in the South Fork Little Butte Creek Watershed. However, Jenny Creek and Emigrant Creek have been identified in the past by Oregon DEQ as having sedimentation as a parameter of concern (ODEQ 1998, p.5).

Natural processes that contribute to sedimentation in the planning area include surface erosion, mass wasting, wildfire, and flood events. Natural landslides and slumps are common features in the Upper Emigrant Subwatershed due to unstable soils. The Oregon Gulch Fire in 2014 and Klamathon Fire in 2018 were the most recent wildfires in the planning area and the most recent major flood event occurred on January 1, 1997.

Accelerated rates of upland erosion in the planning area are primarily caused by road building and logging. Older roads with poor locations, inadequate drainage control and maintenance, and no surfacing are more likely to erode and cause the sedimentation of stream habitats. From 2008 to 2010, the BLM conducted an inventory of system and non-system roads within the original boundary of the Monument. This inventory included collecting data on former vehicle routes within the Soda Mountain Wilderness, for development and implementation of restoration actions (road decommissioning) in the Soda Mountain Wilderness Stewardship Plan (USDI BLM 2012). This inventory focused on the road surfacing, culvert sizing and condition, connectivity of roads to aquatic features, stream diversion potential, and erosion potential. The data collected for the original Monument footprint and the future data collected for roads in the expanded area of the Monument would be utilized in the future transportation planning efforts. Logging practices such as clearcut logging, logging in unstable areas, and using tractors on steep slopes contribute to increases over natural sedimentation rates. The effects of logging practices on stream sedimentation are primarily a concern in the Jenny Creek, Bear Creek, and the east fork of Camp Creek Watersheds, where logging has been most prevalent. Logging in unstable areas has likely accelerated several hillslope failures in the Bear Creek Watershed portion of the planning area.

Streambank erosion in the planning area is accelerated by human-caused disturbances such as stream channelization and stream-adjacent land clearing, concentrated livestock grazing, road building, and tractor skid roads. Past stream channelization and stream adjacent land clearing are major factors contributing to stream bank erosion in portions of Jenny Creek. Poorly managed livestock grazing in the late 1800s and early 1900s throughout the planning area was likely a significant cause of stream bank damage and subsequent sedimentation. Stream bank damage resulting from concentrated livestock grazing continues to be a concern for some stream reaches in the Bear Creek, Jenny Creek, and Klamath-Iron Gate Watersheds, particularly where there are still active grazing allotments (USDI BLM 1995b; USDI BLM 2000a; USDI BLM 2000b; USDI BLM 2007a). There are many stream-adjacent roads throughout the planning area that confine stream channels and restrict the natural tendency of streams to move laterally. This can lead to downcutting of the stream bed or erosion of the stream banks. Stream-adjacent roads are also a direct source of sediment to adjacent stream reaches.

Irrigation ditch failures and streamflow diversions also result in increased human- caused stream sedimentation. The Talent Irrigation District's Delivery canal in the Jenny Creek Watershed has had several failures that resulted in large amounts of sediment going directly into Jenny Creek (USDI BLM 1995b, p.36). In addition, an unnamed tributary to Schoolhouse Creek in the Tyler Creek drainage (Bear Creek Watershed) has been used to route water to Emigrant Lake during periods when the Green Springs Power plant has been undergoing repair. This has resulted in scouring to bedrock portions of Schoolhouse Creek from sustained transfer of large amounts of water exceeds the carrying capacity of the stream.

Groundwater

Baseline information to assess the status of groundwater quantity and quality is limited. Groundwater extraction within the planning area is regulated by the State of Oregon (Oregon Water Resources Department) and State of California (State water Resources Control Board). In Oregon, the Klamath Basin is closed to applications for new irrigation wells, but new wells for domestic use are permitted. The Rogue Basin is open to new groundwater permits for all uses, albeit with increasingly stringent review. By law, well reports are prepared and submitted by well constructors when a well is constructed, altered, converted, or decommissioned. In the portion of the planning area in California, which is entirely in the Klamath Basin, development of new wells for all uses is permitted.

6.7.2 Trends

Water Quantity

The climate in the planning area is influenced largely by the Pacific Ocean, which produces hot, dry summers and mild, wet winters. There are three NOAA weather stations in or adjacent to the planning area: Green Springs Power Plant (elevation 2,435 ft.), Howard Prairie Dam (elevation 4,567 ft.), and Copco Dam (elevation 2,700 ft.). The average annual precipitation at these stations ranges from 33 inches at Howard Prairie to 20 inches at Copco Dam. Peak flows result from major storm events that include the rapid melting of snow in the transient snow zone. The largest runoff in the planning area occurs during these events and/or during significant snowmelt, typically in early spring. Low summer flows are exacerbated during years of below normal

precipitation. A reduction of summer low flows has been highly evident in most drainages in Southern Oregon during the long-term drought over the past three years. Reservoirs in and around the planning area including Hyatt, Howard Prairie, and Emigrant have been at record low levels, and some agricultural irrigation operation in the Rogue Valley had a month or more of no water supply. Average minimum flows at the BLM stream gauging station on Jenny Creek (a flow-regulated stream), near the Oregon/California border continue to trend downward. Average minimum flows were the lowest in the stream gauging record (since 1997) in August 2021 (**Figure 6-7.**)

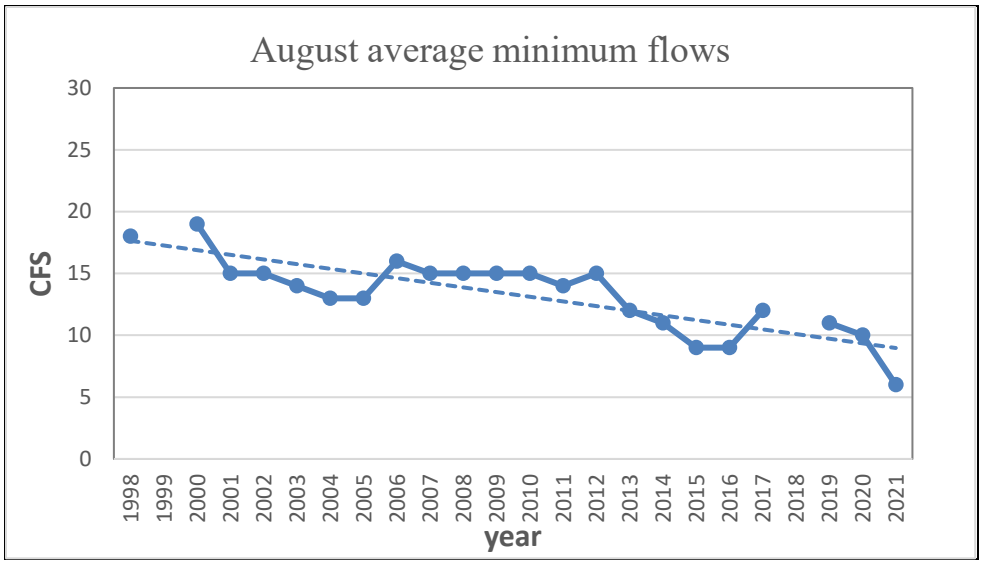

Figure 6-7. Average minimum flows in August at the BLM Jenny Creek stream gaging station

Based on USDI BLM (2022b)

Another indication of the current trend of reduced streamflows and streamflow permanence in the planning area is evidenced by stream temperature data. Since 1992, BLM hydrology staff have operated a network of stream temperature dataloggers at various locations in the Bear Creek, Little Butte Creek, Jenny Creek, and Klamath-Iron Gate watersheds. In 2021, for the first time in 24 years of continuous summer data collection, the stream temperature datalogger at Dutch Oven Creek, a tributary to Camp Creek in the Klamath-Iron Gate watershed went dry during periods of time in late August/early September. The reduction in low flows is documented at other locations in the planning area as well. South Fork Keene Creek, a site which goes dry in most normal years, has been going dry approximately one month earlier in the 2019-2022 monitoring seasons than in summer 1998, the earliest data record (USDI BLM 2022c).

Water Quality

Many factors contribute to the water quality of the hydrologic features in the planning area. As mentioned in the water quantity section above, both natural and human-caused factors contribute to elevated stream temperature in the planning area. In recent years, higher air temperatures, below normal precipitation and subsequent lower streamflows have been added stressors to water quality conditions in the planning area, particularly to stream temperatures. Since 1992, BLM has operated a network of stream dataloggers at various locations across the planning area. The seven-day average maximum temperature has been trending upward during the period of record (1992-2021) at Dutch Oven Creek, a tributary to Camp Creek in the Klamath-Iron Gate watershed (**Figure 6-8**). This site, within the Soda Mountain Wilderness, has a 24-year data record and serves as a reference location for documenting trends since it has unregulated flow and has a history of limited vegetation management. This trend supports the broader changes to the hydrologic resources within the planning area.

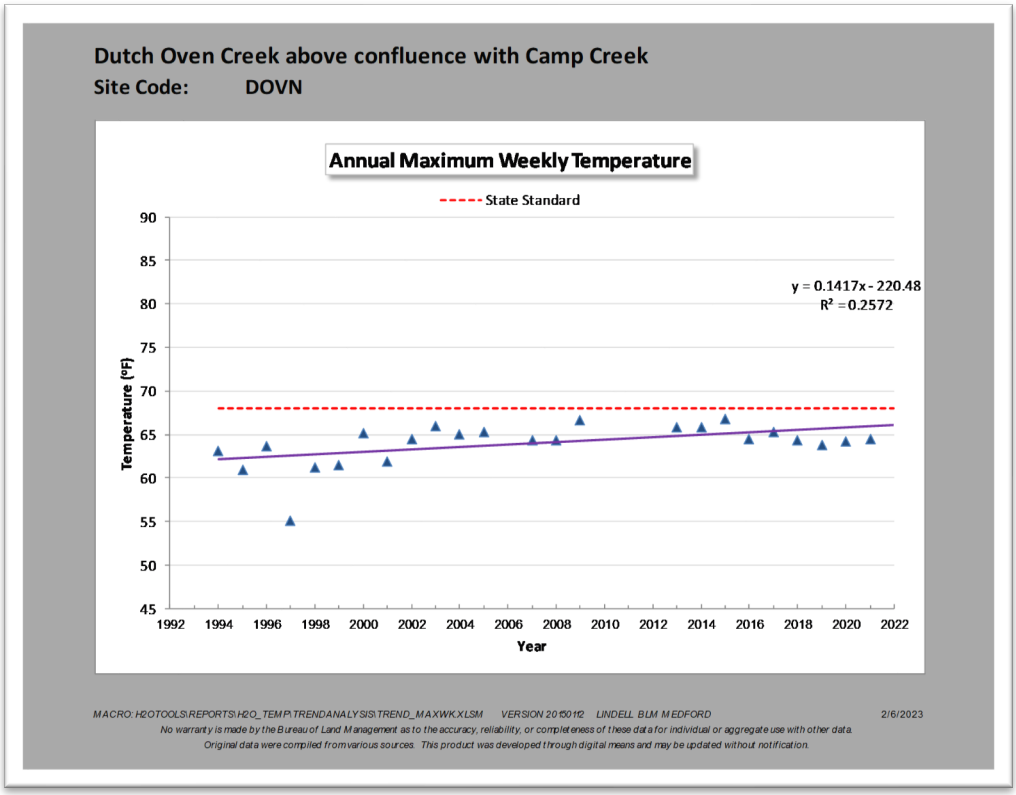

Figure 6-8. Annual seven-day maximum stream temperature trend at Dutch Oven Creek (1992–2021); Klamath-Iron Gate Watershed

Reprinted from USDI BLM (2022c)

Despite general climatic warming conditions, several sites within the planning area exhibit improving trends over the long term. These improvements are especially notable and can likely be attributed to changes in riparian management conditions, particularly the improvement of streamside woody vegetation, decreased width-to-depth ratios, and increased shade. A comparison of stream temperature trends from two long-term monitoring sites on the mainstem

of Jenny Creek on the former Box O Ranch, illustrates the benefit of improved riparian vegetation conditions. While both sites continue to exceed the Oregon temperature standard (seven-day moving average less than 68.0°F in redband trout habitat), there is a trend of improving conditions throughout the length of Jenny Creek on the former Box O Ranch. The upstream site on Jenny Creek, just downstream from the Keene Creek confluence, has maintained a relatively flat trend line, despite the effects of a warming climate (**Figure 6-9**).

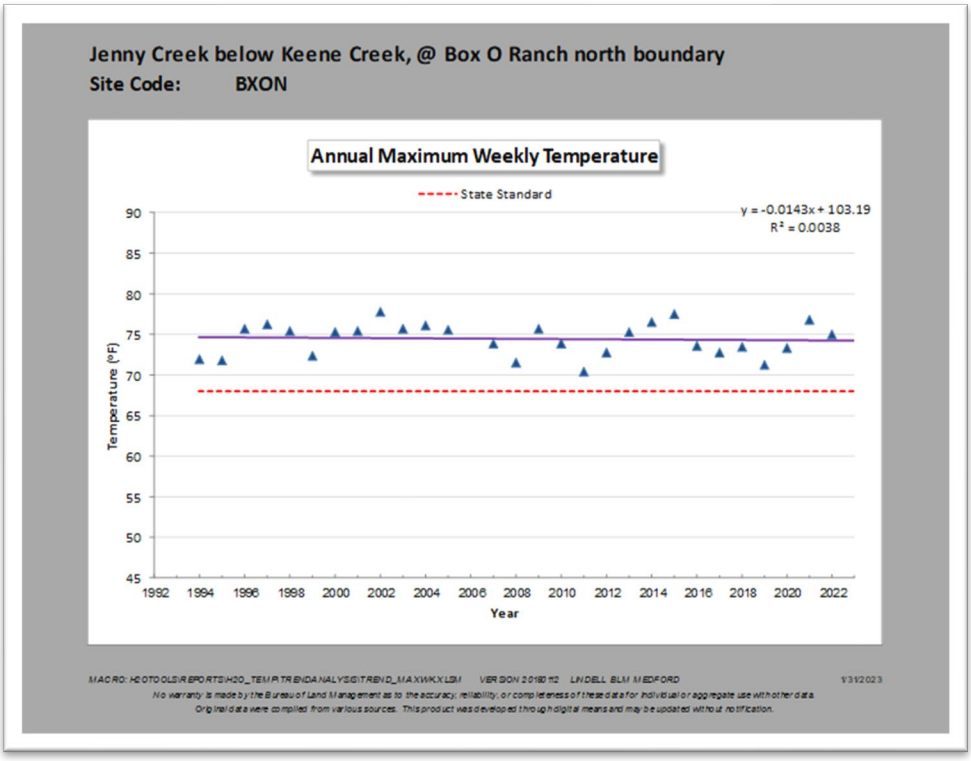

Figure 6-9. Jenny Creek-annual seven-day maximum stream temperature trend, north boundary of the former Box O Ranch (1992- 2021); Jenny Creek Watershed

Reprinted from USDI BLM (2022c)

By comparison, the overall the annual maximum weekly temperatures at a monitoring site at the southern end of the former Box O Ranch, two miles downstream on Jenny Creek are trending downward (**Figure 6-10**). The annual maximum weekly temperatures continue to be higher at the downstream site than the upstream site, meaning there continues to be a thermal input to Jenny Creek throughout the former Box O Ranch, but the annual maximum weekly temperature is trending downward, even with warmer and drier climatic conditions. Photo monitoring and stream cross-section surveys by BLM over the past decade document the physiological changes and recovery of riparian vegetation on the former Box O Ranch since the cessation of grazing in the late 1990's. Conde Creek Conde Creek, a tributary to Latgawa Creek in the Little Butte Creek watershed, just outside of the planning area has experienced a similar downward trend, likely due to the exclosure of cattle from riparian areas and riparian vegetation improvement.

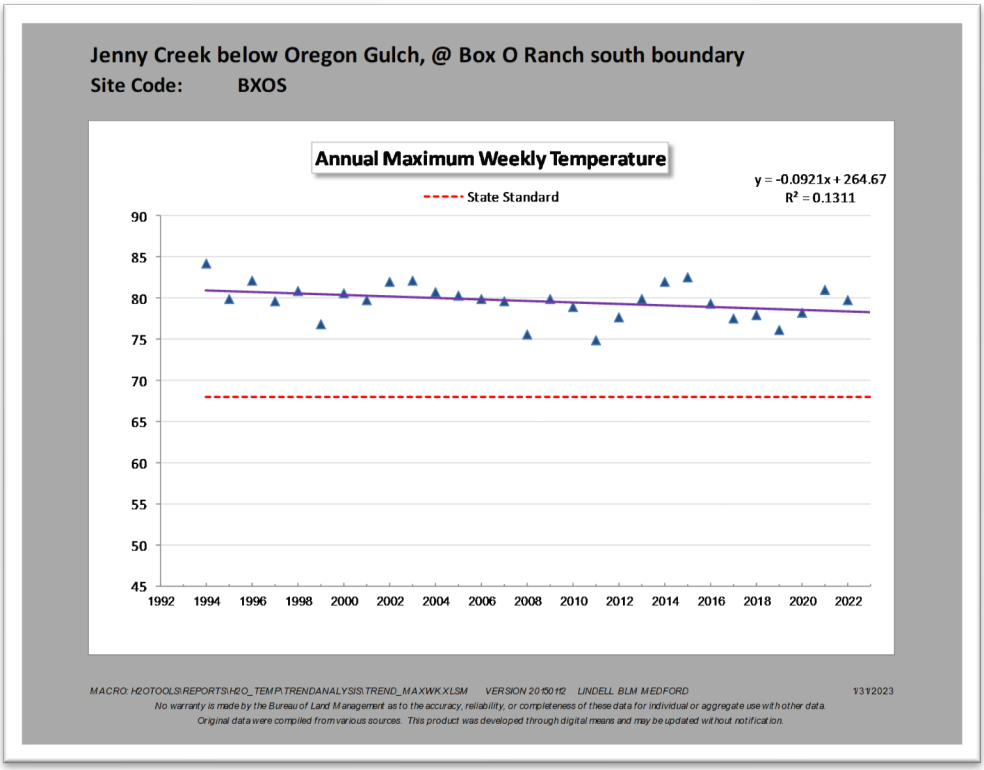

Figure 6-10. Jenny Creek-annual seven-day maximum stream temperature trend, south boundary of the former Box O Ranch (1992-2021); Jenny Creek Watershed

Reprinted from USDI BLM (2022c)

The Upper Bear Creek and Klamath-Iron Gate Watershed Analyses predicted possible improvement in water temperatures in the headwater streams as the 1995 Northwest Forest Plan was implemented and riparian vegetation recovered (USDI BLM 2000a; USDI BLM 2000b). Overall, the implementation of Aquatic Conservation Strategy Objectives (USDA FS and USDI BLM 1994a, p. B-11) and establishment of Riparian Reserves on BLM-administered lands has resulted in protected and improved riparian habitat.

Sources of sedimentation and turbidity on BLM-administered lands within and adjacent to the planning area have been reduced, due to changes in management and road decommissioning activities. From 2012 to 2018, BLM decommissioned roads in the Little Butte Creek Watershed, and within the Soda Mountain Wilderness in the Jenny Creek, Klamath-Iron Gate, and Cottonwood Creek Watersheds. Road decommissioning activities include, removing culverts and fill at stream crossings and ditch relief locations, laying back stream banks to at least a 2:1 slope, restoring stream channel gradient, recontouring the road prism, breaking up compaction, scattering available vegetation, and spreading native seed to prevent erosion.

Groundwater

No groundwater monitoring wells exist on BLM-administered lands within the planning area. BLM has observed decreased production from artesian springs during the past 2 years in late

summer/early fall at the Tub Springs Wayside, an Oregon State Park located within the planning area. Additionally, phone calls and inquiries to BLM regarding drying or reduced production from wells on private lands within or adjacent to the planning area have also increased in the past several years. During drought, increased groundwater pumping coupled with reduced recharge can result in lower water yields from wells.

6.7.3 Forecasts

Climate change would likely affect physical hydrologic processes on BLM-administered lands within the planning area. Climate change studies modeling future conditions suggest alteration in the amount, timing, and type of precipitation, snowpack storage volumes, and the timing and rate of snowmelt (Halofsky et al. 2022). These changes are expected to reduce summer streamflow and increase stream temperatures. Changes to the timing, duration, and frequency of peakflows is also anticipated. Additionally, changes in the amount and timing of precipitation would affect vegetation, which can further alter water availability.

Earlier snowmelt and less snow accumulation are the principal changes in the hydrology of Western U.S. Mountains (Barnett et al. 2008). Snowpack storage can be accounted for with two metrics: depth (snow water equivalent) and duration (snow residence time). In the lower elevation portions of the planning area, the areas that are in rain-dominated hydroregions (at elevations less than 2500 ft in the Rogue Basin and less than 3000 ft elevation in the Klamath Basin), snow is already absent or short lived, so not much change is expected. At the mid-elevations in the rain-on snow hydroregions (elevation 2500 ft to 5000 ft in the Rogue Basin and 3000 ft to 4000 ft in the Klamath Basin), climate models suggest the more transient or ephemeral snowpacks would be mostly eliminated with climate change by the 2080s (Halofsky et al. 2022). In the snow-dominated hydroregions of the planning area (elevation above 5000 ft in the Rogue Basin and above 4000 ft in the Klamath Basin), climate models predict a 55% to 80% decline of snow residence time. Luce et al. (2014) developed this prediction based on a 3° Celsius increase in December-March average temperature. Overall, in both rain-on-snow and snow dominated hydroregions in the planning area, precipitation would spend less time as snow.

Over the past 50 years, winters in the Pacific Northwest have warmed and precipitation has declined in the mountains during this period (Luce et al. 2013). This has resulted in smaller snowpacks that melt out earlier in the year with less recharge to aquifers, resulting in decreasing summer flows and a higher percentage of annual flows occurring earlier in the water year (Halofsky et al. 2022). In addition to snowmelt, summer low flows are influenced by landscape drainage efficiency, which is determined by underlying geology. Climate dictates the form of precipitation, but geology and topography dictate how long it takes groundwater recharge to provide streamflow. Models that incorporate changes in snowmelt and the underlying geology suggest a 10 to 30% reduction in low flows across the planning area, with the more significant reductions in the watersheds in Klamath Basin portions (Halofsky et al. 2022). These models do not take into account changes in vegetation associated with climate change. Increasing drought and resultant increases in fire and mortality may initially increase base flows. However, if such disturbances keep forests in earlier seral stages, increased water demand from vegetation may make low flows even lower (Perry and Jones 2017).

Peak streamflows in the planning area are the result of a combination of climatic and land management factors. Climatic factors contributing to peak flows include high intensity storms, snow melt, rain-on-snow events, and severe extensive wildfires. In general, as temperatures warm, the rain-on-snow hydro zone, an elevation band below which there is rarely snow and above which there is rarely rain, would shift upward in elevation. This may result in strongly increased flooding in basins where there is a large area that is in the snow dominated hydro region. Conversely, in basins where there is a small area classified as a snow dominated hydro region, the upward shift in rain-on-snow zone may modestly increase the area of ground in the rain-on-snow zone, causing a modest increase in flooding. In basins such as these, it is possible that the elevation shift could shrink the total area within rain-on-snow zone and increase the area that is rain dominated. Estimated peak flow increases across the planning area range from 10% to 30%, with the most significant increases in the Klamath Basin portions (Halofsky et al. 2022).

Increased air temperatures and decreased summer flows would be added stressors to streams with impaired water quality. The increased frequency and duration of drought would increase groundwater pumping, potentially resulting in lower water yields from wells.

In conclusion, the vulnerability assessment for southwest Oregon (Halofsky et al. 2022), which covers the majority of the planning area, shows that the effects of climate change on hydrology in southwest Oregon would be significant, although not as pronounced as in other areas of the Pacific Northwest where more of the land area is covered by high mountains. Decreased snowpack and earlier snowmelt would shift the timing and magnitude of streamflow; peak flows would be higher, and summer low flows would be lower.

6.8 Lands with Wilderness Characteristics Outside of Designated Wilderness

The BLM is required under Section 201 of FLPMA and current BLM policy to inventory wilderness characteristics and to consider such information during land use planning. BLM Manual 6310 provides guidance on conducting wilderness characteristics inventories which uses criteria from Section 2(c) of the Wilderness Act. To have wilderness characteristics an area must possess:

1) Sufficient size -
    a) Roadless areas with over 5,000 acres of contiguous BLM lands.
    b) Roadless areas less than 5,000 acres of contiguous BLM lands where any one of the following apply:
        i) They are contiguous with lands that have been formally determined to have wilderness or potential wilderness values, or any federal lands managed for the protection of wilderness characteristics.
        ii) It is demonstrated that the area is of sufficient size as to make practicable its preservation and use in an unimpaired condition.
        iii) Any roadless island of public lands.
2) Naturalness –
    a) the area must appear to have been affected primarily by the forces of nature, and any work of human beings must be substantially unnoticeable.

3) Outstanding opportunities for solitude or a primitive and unconfined type of recreation.

6.8.1 Current Conditions

The BLM OR/WA completed an inventory of lands with wilderness characteristics (LWC) for the Southwestern Oregon RMP planning effort in 2013, which included lands in Oregon that are now part of the CSNM (expansion area). The BLM did not identify any LWC within the planning area for this RMP. The BLM CA conducted an inventory of LWC in preparation for the Northern California Integrated Plan in 2016 that included lands in California that are now part of the CSNM (expansion area). The BLM did not identify any lands with wilderness characteristics in this inventory either.

For this planning effort, the BLM would conduct a LWC inventory for the BLM-administered lands in California that are included in the CSNM expansion area that border the Soda Mountain Wilderness and BLM-administered lands in the original CSNM boundary. A preliminary GIS exercise identified two parcels of BLM-administered land in California that border the Soda Mountain Wilderness, one is approximately 212 acres and the other is approximately 163 acres. These parcels would be evaluated further to determine if they possess naturalness and provide outstanding opportunities for solitude or a primitive and unconfined type of recreation.

If lands are identified as having wilderness characteristics during the inventory, the BLM, per Manual 6320, may choose any one of the following outcomes or a combination thereof for the parcels of land:

- Prioritize other uses while not protecting wilderness characteristics.
- Minimize impacts to wilderness characteristics while managing for other uses.
- Protect wilderness characteristics as a priority over other multiple uses.

6.8.2 Trends

The CSNM was designated to protect and restore the ecological and biological diversity of the area, which can be accomplished through land acquisition, removal of developments, and passive and active restoration. With these adjustments, comes a need for reoccurring updated inventories of lands with wilderness characteristics to evaluate if wilderness characteristics can be identified in other locations.

6.8.3 Current Conditions

Land use authorizations on BLM-administered land include right-of-way grants, permits, leases, and easements under several different authorities, including Section 302 of the Federal Land Policy and Management Act of 1976 (FLPMA); the Recreation and Public Purposes (R&PP) Act of 1926, as amended (43 USC 869); and the Mineral Leasing Act of 1920, as amended. Valid existing rights in the CSNM include many of these land use authorizations as well as facilities constructed under the following authorities: R.S. 2477 (Rights of Way Act) and R.S. 2339 (Reservoirs, Canals, Ditches).

Currently there are many landowners without any legal authorization, who access their properties under casual use, until the need for documented legal access is required. Per 43 CFR 2801.5(b), casual use is "activities that involve practices which do not ordinarily cause any appreciable disturbance or damage to the public lands, resources or improvements and, therefore, do not require a right-of-way grant or temporary use permit under this title."

The checkerboard land ownership pattern within the planning area generates most of the need to cross public lands in order to provide access and utilities to intermingled private lands. The BLM generally does not know the location and nature of such proposals until the BLM receives an application. Currently, the BLM issues the most right-of-way grants over BLM-administered lands in the planning area for access roads. Access roads are used for ingress/egress to private residences, commercial properties, and commercial timber harvest on private lands. Access to private lands and public lands over existing roads for non-commercial purposes is considered casual use and does not require a ROW in most cases. However, most of the ROW grants for this use are typically driven by certain circumstances including legal access for title closure during home or property sales, title insurance, or county permitting requirements. The BLM can grant ROWs to satisfy those circumstances even though the use is consistent with casual use.

New ROW grants issued after October 21, 1976, are typically issued under FLPMA. FLPMA provides the authority to issue ROWs to construct, operate, maintain, and terminate facilities on public lands in accordance and where compatible with the proclamation.

Except for large electric transmission lines, in most cases, other linear rights-of-way (for uses such as domestic or irrigation waterlines or utility lines for servicing residences) are authorized within or adjacent to existing right-of-way corridors where appropriate.

At the time of the proclamations inception, the lands within the Monument boundary consisted of primarily federal lands and private timber industry lands co-mingled with non-industrial private inholdings. The O&C Sustained Yield Act provides for mutual and beneficial access between federal and private industrial landowners for purposes of forest management. The federal lands and the private industrial lands are, largely managed, under O&C reciprocal agreements pursuant to the O&C Act and allow for actions such as road construction, yarding wedges, and tailholds. An O&C reciprocal agreement is composed of two parts; the United States rights over private lands is governed by a ROW and a road use agreement whereas private industrial rights over United States lands are governed by an O&C logging road ROW permit. Both ROW and road use agreements and O&C logging road ROW permits are authorized in perpetuity.

Of the BLM-administered lands in the planning area (see **Table 2-1** and **Map 2-2.** Cascade-Siskiyou National Monument – Planning Area), approximately 58,640 acres, or 54 percent, are encumbered under O&C logging road ROW permits authorized in Oregon.

The BLM has acquired, primarily through Land and Water Conservation Funds (LWCF), an additional 13,000 acres that were once private lands within the original planning area boundary. The BLM may purchase or acquire land and interests in land (including access easements, conservation easements, mineral rights, and water rights) as authorized under section 205(a) of FLPMA. The agency acquires land and land interests from willing sellers by donation, exchange,

or purchase at fair market value when it is in the public interest, consistent with land use management plans, and funding is available. The most common funding source for land acquisition is the LWCF. Lands are generally acquired for one of the following purposes:

- Improve management of natural resources through consolidation of federal, Tribal, and/or state lands
- Increase recreational opportunities and secure public access to public lands
- Preserve open space and traditional landscapes
- Secure key property necessary to protect endangered species, promote biological diversity, and preserve wildlife habitat and migration corridors
- Preserve archaeological, historical, and paleontological resources

As authorized under Section 302 of FLPMA, the BLM has also authorized other activities on public land using permits, easements, or leases, including apiary (beehive) sites, agricultural cultivation of small areas, residential or other structures pending their removal or long-term authorization, and other miscellaneous short-term activities such as commercial filming. This includes 17 long-standing non-commercial residential occupancy leases for houses and cabins on Hyatt Lake. At the discretion of the BLM, they are renewable and assignable, with approximately three to five leases being assigned in any given five-year period.

Three existing communications sites are located on BLM-administered lands within the planning area: Soda Mountain, Chestnut Mountain, and Table Mountain. Communication sites provide facilities for a range of communication infrastructure including broadcasting services such as radio and television and non-broadcast uses including cellular service, radio communications such as dispatch, wireless internet, and other communications systems. Due to the technological limitations of signal transmission, potential locations are generally limited to high elevation points with road and powerline access.

Soda Mountain communication site is a critical backhaul site, which ties together multiple, communication sites, feeding to dispatch centers, for fire and emergency as well as other local municipalities and services. Some of the facilities on the Soda Mountain communication site are approaching their life expectancy and would need to be repaired or replaced to continue to provide coverage and services.

At the Table Mountain communication site BLM has a prefabricated building with communication equipment. The BLM also acquired an easement for additional facilities, at the communication site.

Chestnut Mountain has historically been a smaller communication site primarily used for broadcasting by public radio and public television.

Unauthorized uses also occur within the planning area. Many trespass actions are inadvertent due to lack of surveyed and marked boundaries with intermixed land ownership. Common examples of trespass actions in southern Oregon/northern California have included construction of unauthorized roads and trails, buildings, agricultural development including illegal marijuana grows, and unauthorized installation of water developments such as spring boxes and pipelines.

6.8.4 Forecasts

Interest in wilderness resources throughout the decision area has local, regional, and national significance. Public interest in the BLM's wilderness characteristics inventory determinations, as well as management actions for these areas, has increased in the past 20 years, and is expected to continue increasing. Conflicts between development interests and preservation interests across all public lands are expected to increase into the future.

6.9 LANDS AND REALTY

6.9.1 Current Conditions

Since 2008, the BLM has acquired approximately 12,800 acres of lands within the original Monument boundary. There are numerous BLM authorizations, primarily linear or site authorizations, and O&C reciprocal right-of-way agreements within the planning area. The BLM is working on identifying all existing authorizations. Examples of linear authorizations are right-of-way grants for roads, utility lines, and water developments, such as ditches or canals. Site authorizations are mainly associated with the communication site at Soda Mountain, the Pinehurst School complex, occupancy leases in the Hyatt Lake area, and other established sites. O&C reciprocal right-of-way agreements are perpetual encumbrances on both federal and private lands, roads, and rights-of-way. There are also three existing utility corridors within the planning area that all have existing authorized facilities within them.

6.9.2 Trends

Southern Oregon and northern California have experienced steady population growth. Jackson County has increased from 146,389 in 1990 to 203,206 in 2010 to 223,259 in 2020 (U.S. Census Bureau). Based on this trend and the complications of the checkerboard ownership pattern creates, the BLM anticipates an increase in the need to use public lands to access private parcels, and parcels of public lands beyond private parcels where BLM has acquired public access through easement acquisitions.

The current communications sites at Table Mountain, Chestnut Mountain, and Soda Mountain continue to be used and are subject to applications for amendments as technologies change. The Oregon Department of Transportation (ODOT) Communication Site at Table Mountain was constructed to reduce the amount of microwave antennas at Soda Mountain which was completed in the last 10 years. In 2007, U. S. Cellular added pipe stanchions to hold antennas, which provided coverage over Northern California, at the Soda Mountain Communication site, through an amendment.

The BLM authorized underground relocation of overhead lines by KOBI broadcasting at the Soda Mountain Communication Site in 2017.

The occupancy leases at Hyatt Lake would expire at the end of 2024; the BLM is currently considering their renewal and any changes to the current lease agreement. The lease holders have requested longer-term leases, comparable to special use permit terms at locations in the area,

such as Lake of the Woods and Howard Prairie campgrounds managed by the United States Forest Service (USDA FS).

6.9.3 Forecasts

As the population of the planning area continues to increase along with the general population increase in the broader southern Oregon/northern California area, demand for development of residences and seasonal homes, and possibly the development of recreational facilities, such as campgrounds and resorts on private lands, would increase. The increased development would likely result in an increase of applications for linear rights of way for use of roads and utilities. There would likely continue to be an increase in ROW grants issued for residential purposes for ingress/egress across public lands. As property sales increase, the need for ROW grants would likely also increase for this use based on clearing up "legal access" issues on title reports.

Power companies are increasingly focused on fire hardening improvements of their facilities and undertaking more aggressive vegetation management along power lines to reduce the risk of causing wildfires. Water demand and exercising of water rights (which are administered by the states) has been a growing concern and source of conflict throughout the West as climate change, droughts, and increased demand stress systems. Applications to exercise, improve, or change R.S. 2339 water infrastructure developments have been steadily increasing throughout the West. Trespass uses of water sources on BLM-administered lands is also expected to increase as available water sources decrease and population density increases.

The volume of timber harvest on private lands is expected to continue to fluctuate from year to year based on factors such as wildfire/insect salvage needs and market factors including timber prices, fuel prices, and mill demand. The need for use of BLM-administered lands and roads for private timber haul would vary accordingly from year to year.

The demand for broadband capacity is rapidly increasing due to a variety of factors including greater numbers of wireless devices, increased needs for data speeds and capacity for home entertainment and home offices as well as business use. As more people live and recreate in the planning area, there is a greater need for public agency emergency services communications including 911 dispatch and governmental agency communications including Oregon Department of Forestry for wildfire prevention and control. Numerous federal initiatives and Acts are aimed at expanding rural broadband availability including $65 billion allocated in the Infrastructure and Jobs Act, the ReConnect program administered by the USDA, Rural Digital Opportunity and Connect America Funds administered by the Federal Communication Commission, and the Emergency Broadcast Benefit Program.

The current authorizations and the communication site management plans may need to be revised to meet technological advancements. Communication site management plans should generally be re-written every 10 years. Renewal and assignments of authorized uses may also be completed through an application process.

The BLM is likely to consider and pursue acquisitions within the planning area. The agency acquires land and land interests from willing sellers by donation, exchange, or purchase at fair market value when it is in the public interest, consistent with land use management plans, and

funding is available. The most common funding source for land acquisition is the Land and Water Conservation Fund.

Current market trends suggest that identifying willing sellers and willing landowners to provide access via easement acquisitions within the planning area is becoming increasingly difficult.

6.10 LIVESTOCK GRAZING

For Grazing Management within the original boundary of the CSNM, Proclamation 7318 states: "The Secretary of the Interior shall study the impacts of livestock grazing on the objects of biological interest in the monument with specific attention to sustaining the natural ecosystem dynamics. Existing authorized permits or leases may continue with appropriate terms and conditions under existing laws and regulations. Should grazing be found incompatible with protecting the objects of biological interest, the Secretary shall retire the grazing allotments pursuant to the processes of applicable law. Should grazing permits or leases be relinquished by existing holders, the Secretary shall not reallocate the forage available under such permits or for livestock grazing purposes unless the Secretary specifically finds, pending the outcome of the study, that such reallocation will advance the purposes of the proclamation."

In 2008, after completion of extensive studies of the impacts of livestock on the objects of biological interest in the CSNM, the BLM determined that "there are locations within the CSNM where current livestock grazing practices are not compatible with "protecting the objects of biological interest" as directed by the presidential proclamation" (USDI BLM 2008c and USDI BLM 2008d). After the livestock impact studies were completed, but before the BLM reached a decision on the final compatibility determination, Congressional Representatives worked with stakeholders to create legislation that allowed for the permanent retirement of leases in the original boundary of the CSNM. Section 1402 of the 2009 Omnibus Public Lands Management Act (Public Law 111-11) provided for the permanent retirement of leases that were voluntarily relinquished by lessees (**Table 6-6**). To date, most grazing leases administered by the Medford District in the original boundary of the CSNM have been voluntarily relinquished by the lessees, and the leases permanently retired.

Table 6-6. Omnibus Public Lands Management Act of 2009 grazing allotment lease donations

Allotment	In 2000 CSNM/ In Expansion Area	Total Acres	BLM Acres within CSNM	Notes
Box R Ranch	Yes/No	787	88	Lease Donated under P.L. 111-011
Buck Point	No/Yes	9,205	3,845	Lease Donated under P.L. 111-011
Jenny Creek	Yes/No	1,682	1,659	Lease Donated under P.L. 111-011
Keene Creek	Yes/Yes	44,330	28,353	Lease Donated under P.L. 111-011
Soda Mountain	Yes/Yes	51,601	42,590	Lease Donated under P.L. 111-011
Total		**107,605**	**76,535**	

Most of the current livestock grazing occurs in the CSNM expansion area (see **Table 6-6**). The BLM continues to ensure that livestock grazing is evaluated for conformance with the existing

applicable RMP and for compatibility with the protection of monument objects prior to any decision being made.

6.10.1 Current Conditions

Grazing Leases

There are currently 11 grazing allotments managed by the Ashland, Klamath Falls, and Redding field offices. Approximately 27,858 acres (25 percent) of BLM-administered lands are actively being grazed by livestock in the planning area, representing approximately 55 percent of the total BLM allotment acreage of the eleven grazing allotments (**Table 6-7** and **Map 6-4**. Cascade-Siskiyou National Monument – Grazing Allotments).

Within the 11 allotments, there are ten lessees who have 15 grazing leases for authorization to graze 1,119 cattle and to utilize up to 3,287 animal unit months (AUMs). The 1,119 cattle authorized to graze 3,287 AUMs is calculated using entire allotment acreage, which includes use outside of the planning area. The authorized cattle numbers, authorized AUMs, and the season of use listed in **Table 6-7** are calculated for the whole grazing allotments. An AUM is the amount of forage required to sustain a cow/calf pair for one month. The seasons of use ranges from March 1 to November 30 annually.

Table 6-7. Active grazing allotments in the planning area

Allotment Name (# of leases)	Total Allotment Acres	Total BLM Allotment Acres	Percent BLM Allotment Acreage	BLM Allotment Acres in Planning Area	Percent BLM Allotment Acreage in Planning Area	Current BLM. Authorized AUMs	Current Authorized (# of cattle)	Season of Use
Buck Lake (2)	16,489	11,971	73%	10,284	86%	280	87	6/15-10/15
Buck Mtn. (1)	50,015	8,142	16%	2,323	29%	204	30	5/15-9/1
Conde Creek (2)	11,083	5,491	50%	902	16%	592	168	6/16-9/30
Cove Creek (1)	2,986	1,290	43%	1,290	100%	87	54	5/16-6/30
Cove Ranch (1)	80	80	100%	80	100%	20	4	7/1-11/30
Deadwood (2)	11,860	7,967	67%	6,167	77%	788	393	6/16-8/15 8/16-10/15[a]
Dixie (1)	28,334	5,547	20%	1,283	23%	320	91	5/1-8/15
Fall Creek (1)	301	301	100%	301	100%	48	16	3/1-5/30
Grizzly (2)	9,434	5,153	55%	4,310	84%	378	84	6/1-10/15
Lake Creek Summer (1)	8,872	4,442	50%	633	14%	550	182	7/16-10/15
North Cove Creek (1)	285	285	100%	285	100%	20	10	7/16-9/15
Total	**139,739**	**50,669**	**36%**	**27,858**	**55%**	**3,287**	**1,119**	**3/1-11/30**

[a] 6/16 – 8/15 in even years, 8/16 – 10/15 in odd years

Land Health

Land health assessments in the form of rangeland health assessments (RHAs) for the grazing allotment in the planning area were last completed in 2001 to 2008. At the time, four of the five allotments administered by the BLM Medford District in the original boundary of the CSNM were not meeting one or more of the five rangeland health standards. The fifth allotment (Box R) was not meeting two standards. The Dixie and Buck Mountain allotments (RHAs completed in 2000 to 2001), administered by the BLM's Klamath Falls Field Office, did not meet some standards, and subsequent management changes were implemented in 2002. As noted above, most of the grazing allotments in the original boundary of the CSNM were retired after the leases were donated in 2009.

In summer 2023, the BLM is planning to collect land health information using assessment, inventory, and monitoring (AIM) data. The BLM uses AIM data to evaluate current and long-term conditions of attaining BLM Rangeland Health Standards. This data would inform the condition of ecosystem components in relation to objects of biological interest.

Grazing continues to present resource concerns in the planning area. When the BLM identifies issues, the BLM has altered grazing management practices, such as constructing fencing to exclude grazing. Numerous range improvements have been installed to support effective livestock management, such as drift fences, cattleguards, corrals, spring developments, and stock ponds. The Lessees practice proactive herd management by using rotational grazing, placing salt in key upland locations, and relocating cattle via horseback to increase livestock dispersal.

6.10.2 Trends

Livestock grazing use in the planning area has changed significantly since grazing began here in the 1850s (USDI BLM 2002a, pp. 108-109). At that time unregulated use by large numbers of cattle and sheep grazing within the area caused resource damage that lasted for decades. Grazing on public lands was eventually regulated and by the 1960s had been reduced to half of what it was in the 1800s. An additional 50 percent reduction in livestock grazing occurred after the 1960s, in the 1970s and again in the 1980s.

This lower stocking of cattle with regulated season of use disperses livestock and decreases utilization across the grazing allotments. The BLM does not allow grazing to exceed moderate use (40-60 percent forage utilized), while observed levels of grazing are usually light (21-40 percent forage utilized). On average, this has equated to the removal of approximately a quarter to one-half of the available forage.

The BLM frequently checks for lease/permit compliance, that utilization levels do not exceed moderate use (40-60 percent forage consumption), establish salting locations that disperse cattle, and conduct annual maintenance of range improvements and developments. There are numerous range improvements throughout the allotments established to protect resources such as streams, springs, and fish and wildlife habitat.

Lessees turn in actual use reports annually after the grazing season so that livestock stocking levels can be monitored, and authorized AUMs are not exceeded. **Table 6-8** provides the level of authorized AUMs averaged into 5-year increments and provide the 25-year average. In all

allotments where records are available, actual use records show that authorized AUMs have not been exceeded and have typically been between 50-80 percent of the allotted use between 1998 to 2022.

Table 6-8. Grazing allotments, leased AUMs, and actual use in the planning area (1998-2022)

			BLM Actual Use Average AUMs					
Allotment	**BLM Authorized AUMs**	**Total Authorized AUMs including Private**	**1998-2002**	**2003-2007**	**2008-2012**	**2013-2017**	**2018-2022**	**Actual Use 25-year Average (1998-2022)**
Buck Lake	280	280	No records	No records	No records	No records	No records	No records
Buck Mountain	204	2,004	No records	No records	No records	116	No records	5-year avg. 116
Conde Creek	592	592	337	400	259	256	271	305
Cove Creek	74	87	31	71	32	50	52	47
Cove Ranch	20	20	19	20	20	20	8	17
Deadwood	788	788	575	586	433	630	630	571
Dixie	320	460	380	342	No records	305	No records	15-year avg. 342
Fall Creek	48	48	No records	No records	No records	No records	No records	No records
Grizzly	378	378	361	218	82	177	238	215
Lake Creek Summer	550	550	473	407	421	367	479	429
North Cove Creek	20	20	17	19	12	0	13	12

6.10.3 Forecasts

Demands for federal land grazing allotments are high and are likely to increase because these lands are critical to family run cattle operations and are not readily available. Requests for grazing leases on the Medford District BLM have been high but are not available because grazing allotments are either already in use by other operators or BLM-administered lands have been made unavailable for grazing use by the Southwestern Oregon RMP/ROD (USDI BLM 2016b) and the Omnibus Public Lands Management Act of 2009 (Public Law 111-11, Section 1405).

6.11 MINERALS

6.11.1 Current Conditions

The BLM manages the federal mineral estate for the United States. The land surface overlying this estate can be owned by a nonfederal entity such as the State of Oregon or private interests; these lands are referred to as split estate lands. The mineral estate of a split estate lands may be

owned by entities such as the State of Oregon, private individuals, or corporations. Detailed information is on file in master title plats.

Specific minerals are categorized as locatable, leasable, and saleable. Locatable minerals are minerals for which mining claims can be located under the General Mining Law of 1872, as amended. These include precious metals and some nonmetallic minerals. Leasable minerals include oil, gas, geothermal, coal, and oil shale. Saleable minerals include common variety mineral materials such as sand, gravel, and other aggregate material. Each classification is administered differently and has different requirements for acquisition, exploration, and development.

The mineral potential classification system as described in BLM Manual 3031, Illustration 3, has been used to evaluate in general the potential for locatable, leasable, and salable minerals. Potential refers to the occurrence of mineral resources, not whether a deposit could be economically extracted.

Locatable Minerals

Locatable minerals are managed under the General Mining Act of 1872 (Mining Law) (30 U.S.C. 22-42), as amended, and regulations at 43 CFR 3700 and 3800. The Mining Law provides United States citizens the right to prospect, explore, and develop these minerals on public lands not withdrawn from locatable mineral entry by Congress or the Secretary of the Interior. Exploration for and development of locatable mineral resources under the Mining Law provides a possessory property right to claimed minerals on public lands.

The BLM classifies mining operations in three categories: casual use, Notice, and Plan of Operations (43 CFR 3809.10).

- Casual use generally includes the collection of geochemical, rock, soil, or mineral specimens using hand tools, hand panning, or nonmotorized sluicing. Casual use does not include use of mechanized earth-moving equipment. Casual use activities do not require notification to the BLM.
- Notice-level operations are exploration activities that use heavy equipment and cause five acres or less of surface disturbance. BLM notification is required.
- Plan-level operations exceed five acres of surface disturbance, have bulk sampling greater that 1,000 tons of presumed ore, or occur in certain special status areas.

Proclamations 7318 and 9564 withdrew federal lands from location, entry, and patent under the mining laws, subject to valid existing rights (Appendix A). On public lands in the planning area there have been 113 mining claims that were located for precious metals, uncommon variety clay, gemstones, jasper, and agate. All these claims are now closed. There were two notices for lode gold mining which are now closed. There have been no plans of operations. There are no longer any mining claims in the planning area, and they can no longer be located.

For lands within and approximately five miles around the planning area there are 14 prospects or mines. Commodities were gold, silver, antimony, arsenic, zinc, lead, copper, mercury, clay, gemstones, cement, silica sand, oil shale, and gypsum (DOGAMI 2010; MILO, release 3). Just

south of the planning area there is a decorative rock mine site (California Department of Conservation 2023).

Geologic mapping, geochemical sampling, geophysical studies, and mineral-assessment studies were done on a regional scale for the Medford 1° by 2° quadrangle by the USGS. The probability of exploration maps show the High Cascade Range is rated as exploration unlikely for gold, silver, copper, zinc, iron, manganese, mercury, tungsten, or antimony. The Western Cascade Range, Mt. Ashland Pluton, Hornbrook and Payne Cliff Formation are rated as exploration possible for the fore mentioned commodities, but there are few known deposits or prospects (Smith and Peterson 1985). All the rocks in the planning area are rated as exploration unlikely for chromite, nickel, and asbestos. There is one Oil Shale deposit in the Western Cascade Range at T38S R2E Section 16 at Shale City. This site had a small amount of production in the 1920s. There was also a clay/kaolinite and silica/quartz mine within the planning area (Smith and Peterson 1985). All these mines or prospects are now closed.

The USGS Mineral Resource Assessment maps show two areas within the planning area as having potential for epithermal precious metal deposits. These deposits occur in or near subaerial Tertiary volcanic rocks of flows, tuffs and volcanic-sedimentary rocks that range in composition form andesite to rhyolite. They contain silver, gold, lead, zinc, and copper (Singer et al. 1983). The Barron mine, located on private lands in T39S R2E Section 23, is located within one of these epithermal areas. This historical mine had underground workings and was in production in the early 1900s.

USGS investigations in the Soda Mountain Wilderness (SMW) suggest moderate mineral potential for epithermal precious metal mineralization for gold and silver, based on stream-sediment and heavy-mineral-concentrate samples. The area with concentrations is along the north edge of the wilderness area and within the Dutch Oven Creek watershed. A mine prospect in the northern part of the SMW is located within hydrothermally altered silicic tuff and andesite breccia, it contains significant concentrations of gold and silver (Peters and Willett 1989).

Within the planning area the High Cascade Range, Mt. Ashland Pluton, Hornbrook and Payne Cliff Formations are rated low for locatable mineral potential. The Western Cascade Range is rated as moderate to low for locatable mineral potential. A mineral resources study of the SMW conducted by the USGS concluded much of the northern portion has a moderate potential for gold and silver, which are locatable minerals (Pickthorn 1990).

Leasable Minerals

Leasable minerals are managed under the Mineral Leasing Act of 1920 (Mineral Leasing Act), as amended, and regulations at 43 CFR 3100, 3200, 3400, and 3500. The Mineral Leasing Act authorizes and governs leasing of public lands for developing energy minerals such as coal, oil, gas, and geothermal resources. Before these acts, these materials were subject to mining claims under the General Mining Act of 1872.

The proclamations withdrew Federal lands from all laws relating to mineral and geothermal leasing (Appendix A). There are currently no leases for any leasable minerals in the planning area and none can be issued.

In the past there were 22 oil and gas leases in the planning area, none of them had any production. The volcanic rocks of the planning area are not suitable as reservoir rocks for oil and gas (Fouch 1983). There are no coal deposits in the planning area (Singer et al. 1983).

There have been no geothermal leases issued. Within the planning area there are no known Geothermal Resource Areas, these are areas where BLM has determined that persons knowledgeable in geothermal development would spend money to develop geothermal resources (DOGAMI 2017). Additionally, the planning area is not in a USGS designated Known Geothermal Resource Area, there are ten of these designated areas in Oregon and they are thought to have the conditions favorable for discovery of thermal water of sufficient temperature to make electricity (DOGAMI 2007). Most of the volcanic rocks in Oregon, which includes the planning area are classified as Regions of Known or Potential Geothermal Resources (USDOE 2003).

The mineral potential for coal, oil, and gas is determined to be low. The mineral potential for geothermal is moderate to low.

Salable Minerals/Mineral Materials

Saleable minerals, or mineral materials, are common varieties of minerals and building materials such as quarry rock and gravel. They are managed under the Materials Act of 1947, as amended under regulations at 43 CFR 3600. This law authorizes the BLM the discretionary authority to sell mineral materials at fair market value and to grant free use permits for mineral materials to government agencies and nonprofit organizations. Generally, minerals are widespread, and their value depends largely on market factors, quality of the material, availability of transportation, and transportation costs. Before these acts, mineral materials were subject to mining claims under the General Mining Act of 1872.

The proclamations withdrew federal lands from "location, entry and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the monument" (see Appendix A). The proclamations did not prohibit the use of mineral materials from existing rock quarries in the CSNM (USDI BLM 2008, p. 117). These mineral materials can be used from existing rock quarries for BLM administrative projects through a free use permit.

There are 16 existing rock quarries managed by BLM within the planning area, shown on **Map 6-5**. Cascade-Siskiyou National Monument – Rock Quarries. These sites are not in the Soda Mountain Wilderness or Wild and Scenic River designations. Six sites are less than one acre, five are from one to two acres, and five are three to four acres (example shown on **Figure 6-11**). This acreage includes: the flat crusher pads area and the rock benches/slopes. The crusher pad/equipment area is used to process the broken rock into crushed rock and often the area used to place stockpiles of crushed rock for future use.

Figure 6-11. East Table Mountain Quarry (approximately 3.7 acres)

These quarry sites have provided mineral materials for decades in support of BLM timber sale program, administrative purposes for surfacing roads, drainage protection, and maintenance. The BLM also uses mineral materials for delineating parking areas and blocking access. Mineral materials were sold to timber companies and nearby landowners for their transportation needs. The BLM issued more than 300 permits to the public to collect loose rock by hand for landscaping and other small projects from three quarries in the CSNM. The BLM has issued permits to the county for mineral materials for boat ramps.

Besides providing mineral material, quarries are currently used for dispersed camping areas and some quarries have been turned into parking areas. For example, the crusher pad of the Flying Porcupine quarry is now the Pilot Rock Trail parking area (**Figure 6-12**), and the Table Mountain Snow Park Area parking area was also the crusher pad of a rock quarry.

The mineral potential for salable/mineral materials for the planning area is moderate to high.

6.11.2 Trends

Per Proclamations 7319 and 9564, no new leases would be issued, no new mining claims can be located, and mineral materials can be used from existing rock quarries for BLM administrative projects through a free use permit.

Inventories would continue to be conducted to determine which quarry sites would be available for mineral material extraction, reclamation, dispersed campsites, wildland firefighter safety zones, parking areas, other uses, or a combination thereof within the planning area.

Figure 6-12. Reclaimed Flying Porcupine Quarry is now the Pilot Rock Trail parking area

6.11.3 Forecasts

BLM administrative use by a free use permit from existing quarries would continue. BLM engineers forecast that the total new disturbance (outside of the existing quarry disturbance area (crusher pad, benches/slopes), would be approximately two acres per decade. No new quarries would be developed. The BLM would continue to utilize best management practices and project design features to aid in mitigation measures for quarry projects.

Some quarry sites would be reclaimed or used for other purposes such as parking areas, dispersed camping sites, or wildland fire safety zones or a combination thereof.

The cost (to the taxpayer) for the transportation of mineral materials to BLM administrative projects would be less using quarry sites closest to the administrative project area.

6.12 National Scenic and Historic Trails

6.12.1 Current Condition

Congress identified and designated many significant National Historic Trails through National Trails System Act of 1968 (16 U.S.C. 1241). This act was created to preserve the nation's scenic and historic trails and to ensure that visitors have a meaningful recreational experience.

Two National Scenic and Historic Trails (NSHTs) are present within the Monument. The Applegate Trail, a branch of the California National Historic Trail (CANHT) has approximately one mile within the Monument and is administrated by the National Park Service. The Pacific Crest National Scenic Trail (PCNST) spans approximately 41 miles (38 miles on BLM-administered lands) within the Monument and is administered by the USFS. Both trails are protected by corridors, and both have comprehensive management plans, which guide local management plans, as well as implementation planning, to the BLM within the Monument.

All National Scenic and Historic trails are managed consistent with the nature and purpose of the designated trail as outlined by the trail administrator.

Pacific Crest National Scenic Trail

The Pacific Crest National Scenic Trail (Pacific Crest Trail or PCT) is a long-distance hiking and equestrian trail closely aligned with the highest portion of the Sierra Nevada and Cascade Mountain ranges. The Pacific Crest Trail was designated a National Scenic Trail in 1968. The trail's southern terminus is on the U.S. border with Mexico and its northern terminus is on the U.S. border with Canada, traveling through California, Oregon, and Washington. The Pacific Crest Trail is 2,663 miles long and ranges in elevation from just above sea level at the Oregon-Washington border to 13,153 feet in the Sierra Nevada Mountain range. The PCT covers approximately 32 miles within the planning area. Refer to **Map 6-2**. Cascade-Siskiyou National Monument – Existing Designations.

California National Historic Trail (Applegate)

The California National Historic Trail follows the route taken by farmers, settlers, gold miners, and others who forged their way from Missouri to the Pacific Coast during the California gold rush. The California National Historic Trail is approximately 2,400 miles in length spanning across the western half of North America. The first half of the California National Historic Trail followed the same corridor of networked river valley trails as the Oregon Trail and the Mormon Trail. The California National Historic Trail splits into the Applegate Trail route just north of the Oregon-California border.

The purposes of the California National Historic Trail are to enable all people to envision and experience the heritage and effects of the western overland migration and to encourage preservation of its history and physical remnants. The California National Historic Trail is significant for several reasons. First, it was one of the major highways of the 19th century and provided a 2,400-mile path for emigrants to the West. The arrival of these emigrants dramatically changed the peoples, cultures, and landscapes of the northwest. The California National Historic Trail's route originated through earlier use by Native American and western explorers and travelers.

6.12.2 Trends

The main use of the BLM-administered segment of the Pacific Crest Trail is for day hikes, primarily by residents of the Rogue Valley. The main recreational activity within the Pacific Crest Trail on BLM-administered lands is hiking, followed by equestrian use. In addition to these activities, sightseeing, wildlife observation, photography, camping, and hunting occur. Cross-country skiing occurs along the trail in the winter. The BLM estimates that day use along the BLM-administered segment of the Pacific Crest Trail is approximately 25,000 visitors annually (USDI BLM 2016b).

In addition, non-motorized trail use in the Medford, Oregon, area represents 40 percent of outdoor recreation use on trails (EcoNorthwest 2015, p. 12). According to the Oregon Regional Economic Analysis Project (2022), this area experienced a 138 percent population growth

between 1969 and 2021. During that period, Medford's population rose from 93,841 in 1969 to 223,734 in 2021.

In terms of BLM policy, new guidance has been issued since the last planning effort for the Monument. For example, BLM Manual 6280, issued in 2012, provides line managers and program staff with policies for the management of National Scenic and Historic Trails. Specifically, this manual identifies requirements for the management of trails undergoing National Trail Feasibility Study; trails that are recommended as suitable for National Trail designation through the National Trail Feasibility Study; inventory, planning, management, and monitoring of designated National Scenic and Historic Trails; and data and records management requirements for National Scenic and Historic Trails.

This manual allows for more expansive corridors on trails, side-trails, and connector trails, based on inventories of scenic, and or historic resources, and lays out a process for monitoring those trails through time. With corridors' increased size, this guidance would allow more mitigation of the issues discussed below.

6.12.3 Forecasts

For the Pacific Crest Trail, it is likely that through hikers (continuous south to north hikers) represent only a fraction of the use on the Trail, while day use and overnight trips represent most of the use. As population increases, demand for this resource would also increase.

Management of National Scenic & Historic Trails has also changed since these trails were designated by Congress. The Pacific Crest Trail Foundation Document, a vision document produced in 2022, identified three trends associated with the trail:

- Increasing levels of visitor use, especially long-distance travel;
- Increasing frequency of severe weather events and wildfires impacting the trail treadway and associated structures; and
- Agencies not able to fully maintain, reconstruct, and if necessary, relocate the Pacific Crest Trail to a sustainable equestrian standard (USDA FS 2022).

6.13 Native American Religious Concerns and Tribal Use

There are five federally recognized Tribes that claim ancestral territory or have interests in the planning area:

- The Confederated Tribes of the Grand Ronde Community of Oregon (www.grandronde.org)
- The Confederated Tribes of Siletz Indians (www.ctsi.nsn.us)
- The Cow Creek Band of Umpqua Tribe of Indians (www.cowcreek.com)
- The Klamath Tribes (www.klamathtribes.org)
- The Quartz Valley Indian Reservation (www.qvir.com)

There are two non-federally recognized tribes that also have interest in the planning area:

- The Shasta Tribe
- Shasta Indian Nation

6.13.1 Context

Prior to the late 1840's and early 1850's Euro-American incursions into southern Oregon and northern California were relatively limited and were largely the result of fur gathering expeditions that began in the 1820's. By 1820, Great Britain and the United States had become the chief rivals for control of the Oregon Country and its coastal and interior fur trade. The fur trade had developed into one of the most important early industries, largely conducted by the Russian American Trading Company (Walling 1884). In 1826, Peter Skene Ogden led a foray into southwestern Oregon and northern California, intent on "trapping out" the streams and rivers of the region, as well as exploring and mapping the countryside. Hudson Bay Company members are credited with essentially ruining relations with tribes in southern Oregon as a result of a number of skirmishes in which fur brigade members treated native people harshly and (Douthit 1992). Nonetheless, from the 1820s on there was increasing interest among Americans to acquire Oregon as a territory.

In the early 1830s, the Oregon Trail established a direct route to the Pacific Northwest. The government encouraged Americans to make the journey and settle here to strengthen its claim to the territory. Two Congressional laws, the Northwest Ordinance of 1787 and The Organic Act of 1848, each declared the United States' commitment of good faith and fair treatment toward the native people. However, early settlers didn't really consider these proclamations when choosing where to live. They settled where they pleased, which began the long and often violent acquisition of Native people's most valued asset: their land. The transfer of land away from the Indians took more than a century and assumed many forms. In 1850, before any treaties had been signed or any land legally acquired from the Indians, Congress passed the Donation Land Act, giving 320 acres of Indian land to every settler who wanted it. Within five years, they would claim 2.8 million acres of tribal lands.

The influx of immigrants to the region increased significantly with the discovery of gold, first in California, then in southern Oregon sometime before 1851. Euro-American settlement increased dramatically with the Gold Rush, and by 1853, thousands of immigrants had flooded the region, establishing Ashland Mills and Jacksonville, along with other small settlements across Oregon (Tveskov 2017). These early immigrants came to Southern Oregon to work gold claims, establish ranches or businesses and lay out communities (O'Donnell 1991; Beckham 1971; Sutton and Sutton 1969; Victor 1894; Walling 1884). The influx of white settlers created tension with the Native occupants and many violent skirmishes broke out, with losses on both sides. To try and reduce the incidents of violence, Joseph Lane, Oregon's first territorial governor met with Takelma headman Apserkhahar (later known as Tyee Joe) in the spring of 1850 and agreed upon an informal peace treaty (Wilkinson 2010:74-75; Douthit 2002:69). The peace was short-lived however and by 1853 tensions had escalated once again to outbreaks of violence, with a number of massacres and brutal attacks made by both Natives and settlers on each other. In the summer of 1853 several companies of militia, both citizen volunteers and enlisted men, were organized and on August 17, Joseph Lane arrived in the Rogue River valley to command them. This militia began a campaign against Native people that culminated in a fight at Battle Mountain,

northwest of Table Rocks. Since neither side could prevail against the other, both sides eventually agreed to try and negotiate a treaty of peace.

In September of 1853, leaders of the "Rogue River Indians" including Tyee Joe and his brother Tyee Sam (both Takelma) met with Governor Joseph Lane and then Oregon Superintendent of Indian Affairs, Joel Palmer. Also at this meeting were James Nesmith (a future U.S. Senator), Lafayette Grover (a future Oregon Senator and governor) and lawyer Matthew Deady, who eventually became Oregon's first Unites States District Judge. The meeting took place at the base of Lower Table Rock, where the Native leaders agreed to cede title to most of the land in the Rogue River Valley in exchange for a small reservation that surrounded Upper and Lower Table Rock and included a section along the Rogue River. The Tribes were also to receive $60,000, $15,000 of which was to be used to repay white settlers for losses sustained in the hostilities and $5,000 of which was set aside to purchase agricultural implements and other improvements benefitting the native people. The reservation, which was the first in the Pacific Northwest included all of Table Rock and a section along the north side of the Rogue River.

The treaty was eventually ratified by the U.S. Congress and many of southern Oregon's Indian people moved onto the Table Rock Reservation. The reservation was described as "… extending up Evans Creek to a small prairie and then across the mountains to upper Table Rock, south to the Rogue River and then down the river to the mouth of Evans Creek" (Beckham 1971:124). The document was the first in the Oregon Territory (present-day Oregon and Washington) to be ratified by the U.S. Senate, when it was approved in April 1854. President Franklin Pierce signed the treaty in 1855, and the boundaries described in this treaty are within the planning area.

Much effort was made by both the native Chiefs and the stationed military to preserve the peace and abide by the treaty. However, hostilities between Native people and the local white communities continued. Although there were groups on both sides willing to abide by the Treaty, there were also quite a few who were not interested in keeping to its terms. This led to the formation of several bands of what were essentially vigilantes, who organized various campaigns to kill every Indian they encountered. By the exceptionally harsh winter of 1853, conditions on the Reservation were deplorable. Native people were starving and being decimated by sickness. They feared the roving bands of miners and citizen led militias who were intent on extirpating the Native population. In the summer of 1854 these bands prowled the mountain trails and attacked unsuspecting villages. The situation came to a head in 1855 when an event known as the Lupton Massacre occurred. Clashes in nearby Northern California in the summer and autumn of 1855 and agitation by rival politicians led to an anti-Indian meeting in Jacksonville on October 7 (Schwartz 2022). At this meeting, the newly elected Democratic territorial representative James A. Lupton outlined a plan to exterminate all Native people in the Rogue River Valley. Lupton, who was also known as "Major" Lupton (although he had never served in the military) had arrived in southern Oregon a couple of years earlier and had tried his hand at gold prospecting, as well as farming and a host of other occupations. Most of the men present at this meeting agreed with Lupton and a hastily formed group of vigilantes mustered up to attack the Takelma. The following morning, several parties of men set out to attack Indian camps. There was a small Takelma encampment just outside the Table Rocks reservation, where women, elders and children were waiting for their men to return from a hunt in the mountains. While accounts vary as to the actual number of Indians that were in the camp, it appears that the vigilantes killed at

least 20 native people, mostly women and children. In those attacks, Lupton and another white man were mortally wounded, and ten more were injured in the initial assault. For all intents and purposes, this massacre ended the tentative peace that had been established as a result of the 1853 Treaty and likely triggered the final battle of the "Rogue River Indian War." In the aftermath of this massacre, many Native Americans, fearing for their lives, and incensed by the atrocities committed by the militia, abandoned the reservation, and headed for remote, inaccessible areas from which to conduct “guerilla campaigns” against the settlers (Tveskov 2017). Numerous skirmishes continued after the Lupton incident and culminated in the Battle of Hungry Hill, one of the last major battles fought during this period and the only one in which the native people had a decisive victory.

As a result of the pressure from settlers living in southern Oregon as well as the local governing agencies, and faced with the prospect of a continuing war, Native people began to be “rounded up” for removal to the newly established Coast Reservation. The Coast Indian Reservation (created by Executive Order in 1855) was a 100-mile-long strip of land along the Oregon Coast, from the Nehalem River to just south of Florence, Oregon, and 20 miles inland. The area was essentially a wilderness and was fairly inaccessible, thus it was relatively unexplored and unoccupied.

The Takelma, who had remained on their reservation throughout the hostilities of 1855 through 1856, were removed from their Rogue River valley home in February of 1856 along with bands of other Indians (Upper Umpqua, Upper Takelma, Lowland Takelma, Shasta) (Schwartz 1997: 113; Beckham 1971:166). Shortly after the last battle of Hungry Hill, native people were told to leave the reservation they had been given at Table Rock and endured a forced march in bitter cold and deep snow. Federal troops “escorted” approximately 325 native people from the reservation at Table Rock some 263 miles through the most rugged terrain in the state (Lewis 2016). It took 33 days to reach their new home, and seven tribal members died before they reached the Grand Ronde Reservation on March 25, 1856. The descendants of the Rogue Valley’s tribal people call this forced removal from their ancestral homes their “Trail of Tears.” The Grand Ronde Reservation was established by treaty arrangements and an Executive Order of June 30, 1857, and the people who had been promised a place within their own homelands now found themselves hundreds of miles away. Although each Tribe had their own culture, language, and way of life, they were now forced to live together, many of them far from their original homelands. Evidence of this history can be seen in the names of present-day Oregon Tribes that are identified as “Confederated.” Unfortunately, many of the promises made in treaties were not honored, and one treaty was never ratified.

The Klamath Treaty of 1864 also ceded millions of acres of tribal territory in exchange for a reservation near present day Chiloquin. The boundaries of this treaty encompass lands within the Cascade-Siskiyou National Monument. Like their relatives in western Oregon, European incursion and settlement of Klamath territory resulted in lost access to lands where tribal people had hunted, fished and gathered for thousands of years. By 1864, many tribal people were starving, having been pushed off their lands by ranchers and farmers. Also, like other Oregon tribes, the Klamath were essentially a confederation of the Klamath, Modoc, and Yahooskin Band of Paiute. Relocating these people to one reservation threw three distinct cultures into

conflict which resulted in some of the Modoc people leaving to return to their homeland. The Modoc War of 1872-1873 was the eventual outcome of this return.

The Quartz Valley Indian Community of the Quartz Valley Reservation of California is a federally recognized tribe of Klamath, Karuk, and Shasta Indians in Siskiyou County, California. Shasta people were first contacted by Europeans in 1826 when a Hudson's Bay Company expedition came into the Klamath Mountains to trap beaver. Soon after this arrival, Shasta and Karuk tribal members were devastated by a malaria epidemic that was spread by fur trappers. By 1851, the adverse effects of the disease had reduced the Shasta population to approximately 3,000. Contact with outsiders continued to increase and with the opening of the trade route from Oregon to California in the middle of the 19th century, more people poured into Shasta territory. The largest effects to Shasta and Karuk people came during the California Gold Rush. Gold was found in the Siskiyou Mountains and along the deep rivers that mark their territory, which attracted thousands of miners. Their lands were dramatically altered by the numerous mining operations along the many waterways in their territory. Shasta and Karuk peoples' lives revolved around the rivers and streams in their lands. But the many miners flooding their lands pushed Tribal people out and away from the waterways that had sustained their cultures. Consequently, conflicts arose as the outsiders didn't respect the Shasta and Karuk or their homeland. As with their neighbors to the north and south, fighting and the introduction to new diseases rapidly reduced their numbers.

An 1851 treaty had called for a Shasta reservation in Scott Valley, but the state of California refused to let the treaty be ratified. After the signing of the Rogue River Treaty in 1854, some of the Shasta were removed to the Siletz and then Grand Ronde reservations in Oregon. Others were involved in the Rogue River Wars (1855-1856). In 1934, efforts to establish the Quartz Valley Indian Reservation in Fort Jones, California, began. The reservation was established on land purchased by the United States expressly for the Tribe and was initially for "such Shasta and Upper Klamath Indians eligible to participate in the benefits of the Act of June 18, 1934 (48 Stat. 984)." The original Quartz Valley Reservation was located near the present-day reservation but was terminated by the U.S. government in the 1960s.

In 1954, the federal government passed Public Law 587, The Klamath Termination Act, and Public Law 588, The Western Oregon Indian Termination Act. These acts served to terminate the federal trust relationship between the Tribes and the government, in an attempt to assimilate Native Americans into the predominantly European culture of the United States. The results of assimilation were devastating to Native people, with the loss of any assistance from the Federal government and essentially lost status as individual nations. In 1986, after thirty-two years of persistent lobbying, dedication, and perseverance, the Klamath Tribes regained Federal restoration and termination was revoked through passage of P.L. 99-398, The Klamath Indian Tribe Restoration Act. They were the only Tribe to be "restored" without a land base. Nevertheless, with restoration they regained their treaty rights. The Confederated Tribes of the Siletz began their own battle to win back federal recognition and in 1977 they regained their sovereign nation status. In 1983, with the signing of Public Law 98-165, the Grand Ronde Tribe regained federal recognition.

Today, federally recognized Tribes have a unique relationship with the federal government. They are considered to be sovereign nations and retain inherent powers of self-government. Interaction with federally recognized Tribes takes place at the level of government to government. In addition, some tribal reservation lands are held in trust by the federal government specifically for tribal use and management and are retained as the Tribes' permanent homelands. The Bureau of Indian Affairs is the designated federal agency that administers the government's trust responsibilities and advocates for tribal interests, but all federal agencies hold trust responsibilities to Tribes. Tribes also have interest in lands outside of reservation boundaries, as many of these lands were ceded to the federal government through treaties. Many Tribes exercise their "treaty rights" on lands owned and managed by the federal government. Indian trust resources consist of property (land) and those natural resources and related rights, either on or off Indian lands retained by or reserved for Indian Tribes through treaties, statutes, judicial decisions, and Executive Orders. These rights are protected for Tribes that are federally recognized by the United States. Some Tribes have the right to use trust resources that are transitory or migratory in nature and that move beyond the reach of federal or tribal management such as fish, game, or water. In these cases, Tribes have a right to use these trust resources, but they do not retain exclusive access to those resources.

Regulatory Framework

There are many laws, Executive Orders, and federal policies in addition to agency specific guidance that governs how Federal agencies are required to interact and consult with federally recognized Tribes. Although the highest level of federal obligation comes from the original treaties that were signed and ratified, the following also inform federal decision making:

- The National Historic Preservation Act (NHPA) 54 U.S.C. 300101 to 307108. A 1992 amendment to the NHPA provides that "a Federal agency shall consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance" to a property which falls under the Act. The amendment also specifically recognizes that "properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization may be determined to be eligible for inclusion on the National Register."
- Executive Order 13175, Consultation and Coordination with Indian Tribal Governments (6 November 2000). "Establish regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates upon Indian tribes."
- Secretarial Order 3317, Department of the Interior Policy on Consultation with Indian Tribes (6 December 2011). This outlines the consultation framework by which the DOI has committed to fulfill its Tribal consultation obligations as directed by EO 13175 and other administrative actions, statutes, and policies. It also mandates that all the Departments' bureaus and offices policies comply with this policy.
- BLM Handbook H-1780-1 - Improving and Sustaining BLM-Tribal Relations (USDI BLM 2016d).

- Tribal Forest Protection Act of 2004 – Authorizes the Secretaries of Agriculture and Interior to give special consideration to tribally proposed stewardship contracting or other projects on Forest Service or BLM land bordering or adjacent to Indian trust land to protect the Indian trust resources from fires, disease, or other threats from that Forest Service or BLM land.
- American Indian Religious Freedom Act of 1978.
- Native American Graves Protection and Repatriation.
- The National Environmental Policy Act (NEPA) requires agencies to assess the impact of their activities upon the human environment. This impact is normally assessed through the development of environmental assessments and environmental impact statements. Consultation with and evaluation of the effects upon Indian tribes is provided for in the implementing regulations.
- Executive Order 13007, Indian Sacred Sites.
- Memorandum of Understanding (MOU) Regarding Interagency Coordination and Collaboration for the Protection of Indigenous Sacred Sites (November 2021).

BLM and Tribes are also able to formally coordinate regarding projects and resources of mutual interest by establishing an MOU. The purpose of an MOU is to provide a mutually beneficial process for the Tribe and the BLM to jointly identify, communicate, and coordinate actions of common concern relating to the management of BLM lands and resources, and to provide a mechanism for continuing tribal involvement in the development and revision of land management plans. Various MOUs and other agreements currently exist between the BLM and tribes.

The Klamath Tribes have 185 acres of former reservation (known as the Wood River Wetland) which are tribal trust lands managed by the Klamath Falls Field Office. According to the Treaty of 1864, the Klamath Tribes retain exclusive rights for fishing the streams and lakes of the old reservation, and gathering of edible roots, seeds, and berries. Tribal members often fish the waters of this trust land. However, the Upper Klamath Basin and Wood River Wetland in the Klamath Falls Field Office is not within the decision area for this RMP revision because it has its own RMP.

The Confederated Tribes of Grand Ronde and the Cow Creek Band of Umpqua Tribe of Indians have a MOU with the Medford District for the management of Table Rocks, which has been determined an “Historic Property of Cultural and Religious Significance to Indian Tribes.” It has also been determined eligible to the National Register of Historic Places as a place of cultural significance and part of a sacred landscape that figures prominently within Tribal cosmogonies.

6.13.2 Current Conditions

As stated previously, the BLM manages a portion of the ancestral homelands of western Oregon Tribes and the resources found on those lands. Tribes are regularly consulted for their input on management actions that may affect resources or sites that Tribes find significant. The effects of management actions on cultural resources (pre-contact archaeological sites in particular) are a known area of tribal interest. BLM management also has impacts on other natural resources that

Tribes rely upon for the continuity of traditional beliefs and practices. For example, Tribes in the planning area collect a wide array of plant materials for traditional use. Plants are used in making baskets, hats, or portions of regalia and other objects of tribal culture. Tribal members use a variety of wild plants as traditional foods or as medicine. Similarly, a variety of wild animals are important to Tribes as a food source. In addition, the act of hunting and fishing is an important cultural practice. BLM actions that affect the populations of species such as salmon or affect access to the plants and animals the Tribes identify as important, are of significant interest to Tribes. Additionally, the BLM may manage areas that are sacred to Tribes and hold significance because they are essential to the continuation of cultural traditions, such as places where Tribes hold their ceremonial practices and exercise their beliefs. Areas where tribal members collect plant materials or where their families have fished for generations can also be considered sacred places, but the presence of these resources is not necessary to make a place sacred as traditional practices extend far beyond the tangible. Many places hold significance to Tribes because of their association with a creation story or a part of the Tribes' oral history. A way to ensure these places are properly considered when the BLM proposes management actions is to evaluate them as a Traditional Cultural Property or an Historic Property of Cultural and Religious Significance to Indian Tribes, to be listed on the National Register of Historic Places (NRHP). These two types of "properties" can be a site or a place, or even a landform that is eligible for inclusion on the National Register of Historic Places because of its association with cultural practices and beliefs that are (1) rooted in the history of a community, and (2) are important to maintaining the continuity of that community's traditional beliefs and practices. Aside from the physical resources that are found on the lands that the BLM manages, the social and economic effects of BLM management are a point of interest for Tribes. Both the BLM and many of the western Oregon Tribes manage their own forested lands for timber harvest and for other resource purposes.

Tribes are also interested in protection of archaeological resources such as rock art sites, old village locations and traditional gathering areas. The Siletz, Grand Ronde and Cow Creek Tribes have an ongoing interest in native plant management and have engaged with the BLM through the Indigenous Garden Network to identify areas for planting and management of existing plant patches. The identification of other tribal areas of use is also important to Native Americans and can be accomplished through various types of partnerships or ongoing consultation with Tribes.

Identifying opportunities for partnerships and collaboration with Tribes could make active use of Traditional Ecological Knowledge more widespread and integrated into land management processes.

6.13.3 Trends

Interactions with Tribes are increasing as Tribes are engaged more by the BLM because of new directives and the increased ability of Tribes to respond to federal planning efforts. Tribes continue to acquire funding to support larger staff which translates into the ability for Tribes to respond to invitations to consult and to take a larger role providing more direct input. Larger staff numbers also allow for more direct interaction on the part of Tribes as they can provide staff members to act as Tribal monitors on projects and in some cases actually doing some project work themselves.

6.13.4 Forecasts

Interactions would likely continue to increase; more MOUs and other agreement type documents would be signed. Tribes would have a larger voice in management decisions.

6.14 Invasive, Nonnative Plants and Noxious Weeds

6.14.1 Current Conditions

Introduced nonnative plant species were brought to the Pacific Northwest, accidentally or purposefully, from other continents over the past 150 years. These species are often referred to as 'weeds.' Many weeds or introduced plants are relatively harmless or beneficial. Others, that are not already invasive or noxious, have a high potential to become so in all or part of their range. Plants that have been determined to be 'noxious' based on their negative environmental and/or ecological impacts. A noxious plant species designated by federal or state law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insects or disease; or non-native, new, or not common to the United States (USDI BLM 2007a).

Noxious weeds and nonnative, invasive plants disrupt or have the potential to disrupt or alter the natural ecosystem function, composition, or diversity of infested areas. These species complicate natural resource use and may interfere with management objectives. Noxious Weeds are designated by the Oregon State Weed Board and the California Department of Food and Agriculture Weed Pest Ratings. Noxious weeds are defined by the Oregon Weed Board as "plants which are injurious to public health, agriculture, recreation, wildlife, or any public or private property." Noxious weeds have been declared a menace to public welfare (ODA 2023). However, not all weeds that can cause ecological harm are designated as "noxious".

Two statutory mandates guide the BLM in managing weeds on public lands. Section 302(b) of the Federal Land Policy and Management Act of 1976 directs the BLM to "take any action necessary to prevent unnecessary or undue degradation of the lands" (43 U.S.C. 1732(b)). Section 2(b)(2) of the public Rangelands Improvement Act of 1978 adds that the BLM will "manage, maintain, and improve the condition of the public rangelands so that they become as productive as feasible" (43 U.S.C. 1901(b)(2)).

In general, introduced plants are likely to invade or become invasive since they lack co-evolved competitors and natural enemies to control their populations. Many of these species can out-compete native species for light, food, water and space. A few plants such as dandelion (Taraxacum officinale) and yarrow (Achillea millefolium) have both introduced and have native populations in the North America, complicating matters.

Introduced plants can potentially displace native species, alter plant and animal habitats, and alter ecological processes in plant and animal communities. Noxious weeds can rapidly infest areas following fire events, reducing the natural levels of species diversity (Asher and Harmon 1995). Weeds compete with native species for water, space, and nutrients, are often early and prolific seeders, and may produce fruits capable of long-distance dispersal by various means, such as wind, water, or animal transport. Weed seed can be distributed by being caught-up in fur

or hooves of native animals and livestock. The clothes and soles of recreationists can transport weeds along trails and at campsites. Seeds and root pieces in mud or vegetation that cling to motor vehicles and equipment (bumpers, wheel wells, tires) can be spread along roads to newly disturbed areas or even invade relatively undisturbed sites. Wind, generated by passing vehicles, helps spread weed seeds along roads.

Some introduced species present on public lands have essentially integrated into the natural flora, are not aggressive, don't dominate plant communities, and generally don't cause the problems we usually associate with noxious weeds. Species like certain speedwells, (*Vernonica* spp.) and chickweeds (*Stellaria media*) occur in numerous habitats, but in relatively low densities. Some introduced species can be desirable for reasons such as erosion control after disturbance while waiting for native species to gradually reestablish themselves. Non-persistent species like clover or short-lived grasses like slender wheatgrass (*Elymus trachycaulus*) or annual rye (*Lolium multiflorum*) are sometimes used in this manner. Unfortunately, persistent, aggressive exotics have also been used in erosion control mixes, such as crested wheatgrass (*Agropyron cristatum*) and tall fescue (*Festuca arundinacea*). Species like Himalayan blackberry (*Rubus discolor*), or yellow star-thistle (*Centaurea solstitialis*) can quickly dominate plant communities, and out-compete native species. These species are able to create significant pressure on the succession and evolution of plant communities. Many non-native species are poisonous to wildlife, livestock, and humans.

Of special concern in grasslands, sage lands, and oak woodlands in the west has been the establishment of non-native annual grasses. Grasses like cheatgrass (*Bromus tectorum*) and medusa head (*Taeniatherum caput-medusae*) and Ventenata (*Ventenata dubia)*, *Cynosurus echinatus* (hedgehog dogtail grass), and many other non-native grasses dominate large areas in open woodlands, shrublands, and savannahs throughout the western United States, and in the planning area. These annual grasses out compete native perennial species and have changed the ecology of vast areas in the western North America. The harmful effects of these introductions are just now being realized.

Generally, introduced species respond to disturbance events and can thrive under disturbed conditions. Large populations of exotic species are often present in open, disturbed areas at lower elevations, especially in dry meadows, oak and shrub communities, open pine savanna, and to a minor degree in wet meadows. Once disturbed, these communities are quickly invaded by non-native species from outside seed sources or the soil seed bank. Native grasses and forbs often have great difficulty competing with the weeds that germinate in the fall or winter and are able to outcompete the native species for moisture in soils that are shallow or have limited moisture holding capacity.

Most non-native species in the planning area are currently uncommon in undisturbed, closed canopy, mixed conifer or white fir forests at higher elevations; except where canopy light gaps and soil disturbance are created by roadsides, recreation sites, or skid-trails from old timber harvests. However, there are weed species that once introduced and established, can expand into relatively undisturbed habitats. In southwest Oregon, *Torilis arvensis* and shiny geranium can dominate understories in relatively undisturbed Douglas-fir forests and white oak woodlands. Several thistle species (*Cirsium* spp.) and mullein (*Verbascum thapsus*) are common in disturbed areas at higher elevations. At higher elevations where low intensity fires were historically

common, attempts to create open “park-like” areas in stands of conifers can result in the establishment of weedy thistles and annual grasses.

Sedge and rush dominated wet meadows tend to be more resistant to an invasion by non-native species. However, weedy species which are adapted to wet soils associated with ponds, ditches, or open riverine systems, such as portions of the Parsnip Lakes or Jenny Creek, may occasionally become established. An introduced grass, Reed canary grass (*Phalaris arundinacea*) is documented in Jenny Creek. This species can form a solid mat that excludes all other species. Purple loose-strife (*Lythrum salicaria*) has been a long standinga problem in riparian areas, ponds, seeps, in the Rogue Valley, but has not yet been documented in the planning area.

About ten percent of the flora within the planning area is composed of introduced species, and weeds occur in all plant communities. Introduced plants are found in open plant communities (woodlands, shrublands, savannahs) and disturbed areas in the greatest number and density. Non-natives frequently dominate these open areas, and some are considered noxious weeds. A high number of introduced grasses exist in the Jenny creek area, as a result of past grazing activities and pasture management. There are seven listed noxious weed species introduced in the planning area of particular interest because of their intensity of impact on human welfare and the natural environment, and their potential to cause significant environmental damage. **Table 6-9** lists these most prevalent noxious weed species known to occur in the Cascade Siskiyou National Monument.

Table 6-9. Common introduced and noxious weeds of the CSNM

Common Name	Scientific Name	OR Weed List
Diffuse Knapweed	*Centaurea diffusa*	B
Spotted Knapweed	*Centaurea stoebe*	B
Yellow Starthistle	*Centaurea solstitialis*	B
Canada Thistle	*Cirsium arvense*	B
Dyer's Woad	*Isatis tinctoria*	B
Dalmatian Toadflax	*Linaria dalmatica*	B
Medusahead	*Taeniatherum caput-medusae*	B

B List Weed - Weed of economic importance, regionally abundant but may have limited distribution in some counties

Road building, grazing, logging, recreation, and other disturbance activities have resulted in noxious weeds becoming established in the planning area. Future disturbance activities have the potential to introduce new weeds and create conditions optimal for the expansion of existing populations.

The three most serious noxious weeds in the planning area are yellow starthistle (*Centaurea solstitialis*), Canada thistle *(Cirsium arvense)*, and medusahead (*Taeniatherum caput-medusa*). Dyer’s woad (*Isatis tinctoria*) also has the potential to become a serious ecological problem, in the future.

Yellow starthistle is associated with roads traversing the more open habitats. It has spread into relatively pristine areas from these establishment points. In the Scotch Creek Research Natural Area, yellow starthistle is common and becoming dominant in portions of the savannahs. Other areas where yellow starthistle is also established are along the entire length of the Schoheim road and in portions of the Jenny Creek drainage.

Canada thistle is common along the roads in the area around Hobart Peak and Mill Creek. Canada thistle is an aggressive noxious weed and if left unmanaged, has the potential to form dense infestations. This plant's ability to propagate both sexually and asexually gives it a competitive advantage over many of the plants occupying the same site.

Medusahead is the most common noxious weed in the planning area in terms of numbers and area covered. Many low to middle elevation grasslands are heavily infested. Grasslands on high clay content soils are particularly prone to invasion. Medusahead forms a heavy, high silica thatch that retards or prevents germination of native species and may become a fire hazard.

Dyer's woad (*Isatis tinctoria*), while not as widespread in the planning area is of special concern because of its ability to spread rapidly and invade undisturbed sites. In the Pacific Northwest, it is estimated that dyer's woad is spreading at an annual rate of 14 percent on BLM rangeland.

Map 6-6. Cascade-Siskiyou National Monument - Noxious Weeds Identification shows the most prevalent noxious weed species known to occur in the Cascade-Siskiyou National Monument. It is primarily based on the 1996-2022 Medford District noxious weed surveys, rare plant surveys performed in the 1990s.

6.14.2 Forecasts

Established weed populations would likely continue to expand, and new weed species would continue to appear in the planning area because of natural and human-caused introductions. The degree to which these species spread is directly correlated to human activities, disturbances, and control efforts. Surface-disturbing activities and vehicular travel contribute to weed proliferation, although natural elements, such as climate, wind, and wildlife, would likely also continue to contribute. Range animals, such as livestock and feral and domesticated horses, would also increase the opportunities for invasive plant species to spread and become established. Noxious weeds and invasive plants would be more likely to establish in newly disturbed areas, especially near existing populations. In some areas, control efforts can eradicate species locally.

While it is difficult to predict future introductions of noxious weeds and invasive species, the most likely areas for introduction are those where new disturbances occur, particularly in areas where management actions are not implemented post-disturbance. Historical evidence indicates that new weed species introduced to the area would establish if they are not eradicated quickly.

Control of noxious weeds and invasive plants would depend on the cost and feasibility of available treatment methods. Resource management strategies under the BLM 2018 Integrated Invasive Plant Management for the Medford District Environmental Assessment (USDI BLM 2018) are in place that could contribute to maintaining current levels or reducing the expansion of these species. Examples of these strategies are minimizing surface disturbance and surface-

disturbing activities, reclamation of these disturbed areas, reducing traffic through infested areas, and requiring equipment to be washed prior to and after completion of work.

6.14.3 Trends

As ground disturbance associated with human visitation increases in areas of known populations, the likelihood that noxious weeds and invasive plants would move into disturbed areas also increases. Some species of invasive plants spread without disturbance such as *ventenata* and wind dispersed species like rush skeleton weed. Other sources of potential noxious weed and invasive plant infestations are livestock grazing and routine CSNM activities, such as recreation, fuel treatments, road maintenance, fire response, and even weed-control operations that result in ground disturbance.

Some successes have occurred in controlling certain species in specific areas; if such efforts are expanded, noxious invaders could be contained and new invaders controlled. However, most of the area has not been inventoried for this type of effort to begin. Focused efforts include spot treatments of noxious weeds, and follow-up seeding post-treatment.

6.15 Recreational Use and Visitor Services

6.15.1 Current Conditions

Recreation is an important part of the user experience in the planning area. In 2021, the planning area had an estimated 170,454 visitor days. The major recreational activities in the area include hiking on the Pacific Crest National Scenic Trail and other trails in the area (e.g., Grizzly Peak, Hobart Bluff, Pilot Rock and the Lone Pilot Trails); bicycling and mountain biking; camping at Hyatt Lake Campground and Surveyor Recreation Site; rock climbing at Pilot Rock; horseback riding; driving for pleasure; mushroom hunting; dispersed camping; hunting throughout the planning area; and Nordic skiing and snowmobiling on miles of groomed trails in the winter. Many of these uses, and the facilities or infrastructure that support them, were present prior to the area being designated as a national monument, particularly in the expansion area. For example, the Buck Prairie cross country ski trail system, which includes two trailheads and a restroom; the Table Mountain Winter Play Area, which includes a sledding hill, warming hut, and restroom; and a disc golf course near Grizzly Peak were all present prior to the Monument expansion.

Management of recreation in the planning area is guided by BLM regulations and policies, federal and state laws, current and emerging trends in public demand for recreational opportunities and activities, and areas physical, cultural, and natural surroundings.

The BLM manages recreation through establishing recreation management areas (RMAs) and through issuance of special recreation permits (SRPs) and recreation use permits. BLM Handbook H-8320-1, Planning for Recreation and Visitor Services (USDI BLM 2011b) provides policy guidance on recreation and visitor services on public lands and waters. Under this policy, during the RMP process the BLM designates public lands and waters as Special Recreation Management Areas (SRMA) where it recognizes recreation management as the predominant land use plan focus and where the BLM intends to manage and provide specific recreation

opportunities and recreation setting characteristics on a long-term basis. In addition, the BLM designates Extensive Recreation Management Areas (ERMA) as administrative units that require specific management consideration in order to address recreation use or demand, but where recreation management is commensurate and considered in context with the management of other resources and resource uses.

BLM-administered lands that are not designated as RMAs (undesignated lands) are managed to meet basic recreation and visitor services and resource stewardship needs. Recreation is not emphasized on these lands; however, recreation activities may occur, except on those lands closed to public use. The recreation and visitor services are managed to allow recreation uses that are not in conflict with the primary uses of these lands.

RMAs may be divided into Recreation Management Zones (RMZs) to further delineate specific recreation opportunities. A SRMA RMZ would define the specific recreation opportunities that is the focus of recreation and visitor services management, while an ERMA RMZ would ensure recreation is managed commensurate with other resources.

There are no existing designated RMAs in the original boundary of the CSNM or on the CA lands in the planning area. Within the expansion area in Oregon, the BLM designated eight RMAs in the SWO RMP. Each RMA has an accompanying framework that guides management of the RMA and describes "the recreation values, types of visitors targeted, the outcome objectives, the Recreation Setting Characteristics, and the applicable management actions and allowable use restrictions" (USDI BLM 2016a). Refer to **Table 6-10** for the CSNM RMAs and their acreage. **Map 6-2**. Cascade-Siskiyou National Monument – Existing Designations shows the Extensive and Special Recreation Management Areas.

Table 6-10. Existing Recreation Management Areas

RMA Name	Acres
Buck Prairie/Hyatt ERMA	9,369
Grizzly Peak Trail SRMA	2,912
Hyatt Lake Campground SRMA	492
Pacific Crest Trail 1 and 2 SRMA	6,070
Table Mountain Snow Play Area SRMA	9
Pacific Crest Trail Corridor SRMA	659
Surveyor Campground SRMA	28
Surveyor Mountain ERMA	11,105

Extensive Recreation Management Areas (ERMAs)

- Buck Prairie/ Hyatt is popular in summer months for cycling and dispersed camping, hunting in the fall, and cross-country skiing, snowshoeing, and snowmobiling on groomed trails in the winter.

- Surveyor Mountain is popular in summer months for cycling, OHV use, and dispersed camping, hunting in the fall, and cross-country skiing, snowshoeing, and snowmobiling on groomed trails in the winter.

Special Recreation Management Areas (SRMAs)

- Grizzly Peak Trail provides mountain biking, hiking, equestrian use, snow shoeing/cross country skiing, and wildlife and botanical viewing on a 3.5-mile loop trail.

- Hyatt Lake Campground provides access to Hyatt Lake recreational opportunities including camping, boating, hiking, fishing, and special events. The Hyatt Lake Campground is a fully developed campground with potable water, showers, flush toilets, fish cleaning station, trash collection, group shelters, boat docks, horse camp, and a fee station.

- Pacific Crest Trail 1 and 2, and Pacific Crest Corridor provide hiking and equestrian recreational opportunities along the 41 miles of the Pacific Crest National Scenic Trail (PCNST) that are in the CSNM.

- Table Mountain Snow Play Area is a snow-based developed recreation site with a sledding/tubing hill, warming hut and bathroom, parking lot, and a large group fire pit.

- Surveyor Campground is a small seven-site, out-of-the-way campground with a vault toilet, picnic tables, fire rings, and an untreated/untested spring for water.

Recreation Use Permits

The Hyatt Lake Recreation Area is the only developed recreation site in the CSNM that is authorized under the Federal Lands and Recreation Enhancement Act to issue recreation use permits to collect day use and overnight camping fees. Fees collected at the Hyatt Lake Recreation Area go to support maintenance, security, visitor information and facility improvements.

Special Recreation Permits

Special Recreation Permits (SRPs) are authorized under the Federal Lands and Recreation Enhancement Act and issued to manage visitor use, protect natural and cultural resources, and accommodate commercial recreation uses. There are five types of uses for which an SRP is required: commercial, competitive, vending, individual or group use in special areas, and organized group activity and event use. Often SRP activities offer a specialized opportunity for the recreating public to experience activities that they themselves do not have the skills, equipment, or resource knowledge to perform independently.

On BLM-administered lands under the 2008 CSNM RMP, SRPs are considered on a “case by case” basis and are issued or renewed only if the proposed activity is found to be consistent with RMP objectives. SRPs involving commercial stock use are not permitted due to the high potential for resource damage from these uses.

The 2012 Soda Mountain Wilderness Stewardship Plan provides similar direction for SRPs in the Soda Mountain Wilderness (SMW) with SRPs considered on a "case by case" basis with commercial stock use, competitive use events, and vending activities not permitted in the SMW (USDI BLM 2012).

On BLM-administered lands currently managed under the 2016 SWO RMP, discretionary SRPs would be issued for a variety of uses that are consistent with resource programs and objectives. SRPs are allowed in six of the eight RMAs in the expanded CSNM lands in Oregon, with no competitive events in the Pacific Crest 1 and 2 SRMA and SRPs prohibited in the PCT Corridor SRMA.

In 2022, two SRPs were issued in the CSNM: a one-day field course to observe butterflies and moths and an endurance horse ride event.

6.15.2 Trends

Recreation use in the planning area has been monitored for many years; however recorded visitation numbers are only a representation of the actual level of recreation use. This can be attributed to the fact that there are numerous access points and recreation locations throughout the planning area which makes it very difficult to accurately count visitation. Recreation visitation estimates are reported in the Recreation Management Information System (RMIS), an internal BLM database. In the planning area, there are 28 recreation sites that recreation visitation estimates are reported in RMIS. This includes trailheads, Surveyor Campground, the Hyatt Lake Recreation area, which includes two campgrounds and a day use area, as well as dispersed recreation locations throughout the planning area. Recreation visitation estimates are based on registrations, permit records, direct observations, and professional judgement. At the Hyatt Lake Recreation Area, camping and day use visitation is based on registration, as well as at several trailheads in the CSNM (Pilot Rock, Grizzly Peak, PCT, and Hobart Bluff). Most recently magnetic road counters and infrared trail counters have been installed at strategic locations and direct observation counts are also occurring during the winter recreation season to acquire more accurate recreational visitation numbers.

Figure 6-13 shows the combined total recreation visits for the 28 recreation sites in the planning area that are reported in RMIS from 2012 through 2022. A recreation visit is the estimated number of visitors who take part in a recreational activity. Estimated visitor use in the planning area has increased from 177,485 in 2012 to 227,447 in 2022, an increase of approximately 22 percent (RMIS 2023).

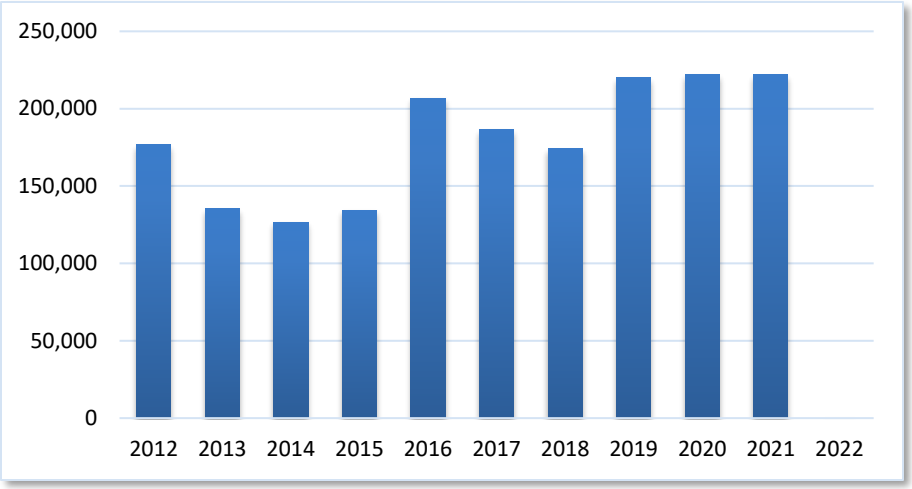

Figure 6-13. Estimated visitor use in the planning area

Based on RMIS data from 2012-2022

Based off inquiries, demand for SRPs does not appear to be increasing significantly. Annually the BLM receives 2-4 inquiries on SRPs but after pre-application consultation the individual usually does not apply. Requests for filming seems to be increasing, though most of these are short term filming request that don't involve the use of actors, models, sets, or props and that don't require a permit.

6.15.3 Forecasts

The demand for public lands for outdoor recreation uses continues to increase in intensity and diversity both nationally and locally. Nationally, recreational visitation to public lands have experienced a record increase of 10 percent from 2020-2021 and are projected to continue to increase. BLM public lands are now recognized as a "Backyard-to- Backcountry" treasure with numerous urban centers and rural towns located within 25 miles of public lands.

Over the past decade, hiking and mountain biking activities have increased significantly in the Rogue Valley area. Requests for trails adjacent to municipalities and nearby public lands are increasing as these recreational activities are often promoted by local and regional travel organizations and are seen as contributing significantly to local economies.

The CSNM forms the backdrop to many parts of the Rogue Valley in southern Oregon and the Shasta Valley in northern California. With the ease of access and diversity of recreational opportunities from skiing and snowmobiling in the winter to hiking, biking, and camping in the summer the BLM expects the demand for recreation use of public lands in the planning area to continue to increase.

6.16 Science and Research

The CSNM in southwest Oregon provides habitat for an astounding array of species and is specifically designated to protect the areas outstanding biodiversity. The planning area has been

studied extensively by many types of scientists and there is excellent information about what kinds of plants and animals we have. But there have been few long-term monitoring programs designed to consistently track the health and long-term trends of important ecosystem components. The BLM from 2017-2022 has been developing and implementing a science-based research and long-term inventory and monitoring program designed to trace the vigor and population trends of the important resources.

CSNM sponsors and collaborates with numerous scientists, academic researchers, universities, and other partners to fulfill research and inventory and monitoring needs. Monument staff are guided by a Science Plan that is designed to apply science to management problems, and gain a better understanding of Monument flora, wildlife, and ecological processes.

6.16.1 Current Conditions

The BLM works closely with interested researchers and organizations to develop proposals and manage projects.

Research

Examples of current research include the following:

1. **Plantation Treatment Research**

   The planning area has at least 70 formally clear-cut areas that are now 30- to 40-year-old plantations. It is a high priority to determine effective thinning treatments that would aid the development to an ecologically healthy late seral stage forest; and at the same time improve soil conditions and create wildlife habitat for encouraging the natural biodiversity of the areas.

2. **Oregon Spotted Frog**

   Dr. Michael Parker of Southern Oregon University has been collecting demography and habitat data on this federally Threatened species for the past 15 years.

3. **Response of Brewer Oak to Wildfire**

   The BLM, in partnership with the University of Nevada, Las Vegas, and placed more than 30 permanent plots to measure the long-term response of the Brewer Oak plant community to various intensities of wildfire. Initial findings show the ecological need of high intensity wildfire in this plant community.

4. **Mollusks**

   The BLM, in partnership with the Xerces Society, is studying mollusk diversity in the planning area. This project includes the development of a map of mollusk hot spots.

5. **Habitat Connectivity and Fragmentation**

   The biological connectivity within the planning area is one of the primary reasons for its establishment. Reconnecting fragmented habitat is critical to maintaining and enhancing biodiversity. The BLM is producing maps based on plant community age and condition in order to enhance and protect effective wildlife corridors.

6. Acoustic Survey of Old Growth Forest Birds

This is an ongoing research project with Southern Oregon University for placing sound recording systems in various plant communities to determine bird inhabitants and other wildlife.

7. Butterfly Project

The BLM, in partnership with the Xerces Society and the Invertebrate Lab at Oregon State University, developed a long-term butterfly monitoring plan in the planning area. In 2019, the BLM and its partners established 20 transects that are monitored annually. Results are entered into an international database, PollardBase, that tracks trends throughout the world. Volunteers have been recruited to adopt a transect, and collections and results would be used for future research.

8. Riparian Restoration and Beaver

The BLM, in partnership with The Beaver Coalition and others, are mapping and identifying riparian areas in need of restoration and beaver reintroduction. This project would recommend various restoration techniques and monitor effectiveness using high-definition Lidar images and mapping techniques.

9. Lichen Communities of White Oak Communities

Researchers with Siskiyou Biosurvey investigated and published a report on the lichens of the oak trees of the planning area and observed floristic patterns that indicate a mix of species from six geographic-floristic groups. They found almost a hundred species of lichens that inhabit oak trees. We are working with him to develop a proposal for lichen long-term monitoring.

10. The imperiled Oregon Vesper Sparrow: Solutions for public lands

The Klamath Bird Observatory has been studying the population biology of the Oregon Vesper Sparrow (*Pooecetes gramineus affinis*) for over 5 years. This species occupies open habitats (grassland, shrub-steppe, and agriculture) across much of central and southern North America. The Oregon vesper sparrow is the rarest of four recognized subspecies. Population declines of the Oregon vesper sparrow likely result primarily from habitat loss and degradation, and potentially from increased predation and human disturbance. One of its primary breeding areas is within the planning area.

11. Distribution of N. American Pika in the CSNM

Dr. Michael Parker of Southern Oregon University continues to research the distribution of the American Pika using GIS mapping and physical surveys.

12. Geochemical analyzation and geologic mapping of the Western and High Cascade

Dr. Jad D'Allura, retired from Southern Oregon University, and various University of Oregon students have spent the past 10 years mapping and geochemically analyzing the rocks of the Western and High cascades and has focused on the geology of the planning area. He and his students from Southern Oregon University and the University of Oregon have developed detailed maps of most of the planning area.

13. Wildlife Photo Documentation of Rare Species

The BLM has set out wildlife cameras in strategic locations to determine wildlife activity areas and what areas are important to various rare species.

14. Native Bees

The BLM is working with the Oregon Bee Atlas and the Invertebrate Lab at Oregon State University to inventory and monitor our native bees at select locations throughout the planning area.

15. Fungi Richness and Uses in Restoration

The BLM is working with Jonathon Frank at Southern Oregon University to inventory fungi and how to use it to build soil health and enhance forest restoration.

16. Native Grassland Restoration

The BLM is working with The Understory Initiative and the Sampson Creek Preserve and in 2020 established 18 permanent plots for effectiveness monitoring of testing different restoration treatments for returning our grasslands from non-native to native grass and pollinator communities.

17. Gentner's Fritillary Recovery, Monitoring, and Research

The BLM is working with the Oregon Native Plant Conservation Program and the State of Oregon to monitor population trends and increase the size of existing populations and create new populations.

Inventory and Monitoring

The BLM collaborates with a wide variety of scientists, universities, government agencies, and local conservation organizations to fulfill our inventory and monitoring needs. The BLM is guided by the concept of applying science to understand our resources and to provide an early-warning system of actual and potential problems that can be detected and managed in a timely manner. Taking an inventory of the species in the planning area is an integral part of monitoring.

Inventory and Monitoring Program Goals

- Determine status and trends of selected vital signs of CSNM ecosystems to help managers make informed decisions and work more effectively with other agencies and the public for the benefit of CSNM resources.
- Provide an early warning system of abnormal conditions and impairment of selected resources to promote effective mitigation and reduce management costs.
- Provide data to better understand the dynamic nature and condition of CSNM ecosystems and to establish reference points for comparisons with future years and other altered environments.
- Provide current data to meet certain legal and congressional mandates related to natural resource management and protection.
- Provide a scientific means of measuring progress towards performance goals.

The BLM has identified the following as high priority vital signs for inventory and monitoring (species and programs with an asterisk (*) are currently being monitored):

1. Vegetation Communities
   - Conifer Forests *
   - Oak Woodlands *
   - Grasslands *

2. Bird Populations
   - Oak Woodland Birds *
   - Northern Spotted Owl
   - Great Grey Owl
   - Vesper Sparrow *
   - Riparian Birds *

3. Wildlife
   - Habitat Connectivity and Fragmentation *
   - Wildlife Photo Project *
   - Wildlife Corridor Mapping *
   - Predators: wolves, fishers, mountain lions

4. Pollinator Species
   - Butterflies *
   - Bees and Bumblebees *

5. Rare Plants
   - Long-term Rare Plant Monitoring Program *
   - Gentner's Fritillary *
   - Greene's Mariposa Lily *
   - Bellingger's Meadowfoam *

6. Mollusks
   - Aquatic Mollusks *
   - Terrestrial Mollusks *

7. Riparian and Aquatic Resource Health
   - Riparian Health and Condition
   - Beaver Populations *
   - Oregon Spotted Frog
   - Endemic Fish *

8. Hydrology
   - Water Quantity and Quality *
   - Stream Connectivity
   - Springs and Seeps*

The BLM is working with the National Park Service (NPS) to integrate their regional vegetation and avian inventory and monitoring efforts with the planning area to contribute to this intensive regional effort. The BLM has installed 30 long-term vegetation monitoring plots, 15 in conifer forest and 15 in oak woodlands. The BLM/NPS has collected one year of data.

The BLM is working with the Klamath Bird Observatory to monitor general birds of the forests and oak woodlands. Currently, there are 22 permanent avian transects installed in oak woodlands. The BLM/Klamath Bird Observatory has collected two years of data. With the Vesper sparrow, a rare species in the planning area, the BLM has incorporated research on their life history and population dynamics as part of this partnership with the Klamath Bird Observatory. The BLM also collaborates with our neighbors, the Vesper Meadow Preserve and The Sampson Creek Preserve in these and other monitoring efforts.

The BLM is partnering with the Xerces Society and the Invertebrate Lab at Oregon State University to develop inventory monitoring protocols for butterflies, bees, and mollusks. These organizations would send experts down to the planning area to work with the ecologist on species identification and collections. We currently have three years of butterfly monitoring from 12 long-term permanent transects.

The BLM is working closely with Southern Oregon University to monitor the Oregon Spotted Frog.

6.16.2 Forecasts

The BLM would continue to encourage research and the development of inventory and monitoring programs into the future. The BLM has a list of potential research opportunities and would continue to engage with various researchers about project ideas, proposals, and funding opportunities. Below is a short list of potential research opportunities in the planning area.

- Oak Woodland Restoration
- Old Growth Wildlife Needs
- Soil Condition and Biota Function and Needs
- Energy Pathways Through the Ecosystem
- Using Soil Fungi Inoculations for Soil Health
- Moth Richness and Ecological Needs
- Plantation Soil Ecology
- Plantation Ecological Structure and Function
- Plant Community Mapping
- Wildlife Connectivity Analysis and Planning
- Ecological Functions of Invertebrates
- Macroinvertebrate Community Analyses
- Road Density and Biodiversity
- Fire Treatment and Wildlife Habitat Creation
- Moss Diversity and Ecological Functions

- Ecological Energy Pathways
- American Fisher Distribution and Habitat Needs
- Spotted Owl Habitat and Protection Needs
- Historic Photos and Vegetation Trends

6.17 SOCIAL AND ECONOMIC VALUES AND ENVIRONMENTAL JUSTICE

6.17.1 Current Conditions

The socioeconomic planning area for the Cascade Siskiyou National Monument plan is Jackson and Klamath counties in Oregon and Siskiyou County in California. While some of the impacts of CSNM management would extend beyond these counties, they are where most of the social and economic impacts of concern would take place, and where there is the greatest potential for effects on environmental justice (low income, minority, and Tribal) populations. This section of the AMS would describe the relevant issues, assess the counties' social and economic conditions, and identify any environmental justice populations.[4] As described in Chapter 5, information related to social and economic values is contained in many of the other resource sections of this AMS.

Jackson County

Just over half of the County is federal land, split nearly evenly between the BLM and the Forest Service. The county population in 2021 was 223,734, an increase of about 23 percent from 2000. The county seat and largest city is Medford, which has a population of 84,894. Other sizeable cities include Ashland (21,348), the closest city to the Monument, and Central Point (18,948). In 2021, the median age of county residents was 42, slightly higher than the median for Oregon residents (40). Of the population 25 years and older, 30 percent had a bachelor's degree or higher level of education, compared to 35 percent statewide.

About 88 percent of county residents reported their race as white, compared to about 81 percent of Oregon residents.[5] About one percent or less reported their race as Black or African American, American Indian, Asian, or Native Hawaiian or other Pacific Islander, and seven percent said they were two or more races. All of these percentages were lower than those for Oregon residents as a whole. Fourteen percent reported being Hispanic or Latino (of any race), about the same percent as reported by Oregon residents. Considering both race and ethnicity, 79 percent of county residents reported being white and not Hispanic, so the total minority population is 21 percent, compared to 26 percent statewide.

Out of the 127,000 jobs in Jackson County in 2021, 18 percent were in non-services industries, with the majority in construction and manufacturing. About 74 percent were in services-related

[4] Unless otherwise noted, county data comes from the BLM Socioeconomic Profile Tool (https://headwaterseconomics.org/tools/blm-profiles/).

[5] The U.S. Census Bureau measures race separately from ethnicity. Race is defined most basically as American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, Black or African American, White, some other race (other than White), or a combination of two or more races. Ethnicity is defined as either being Hispanic/Latino or not, regardless of race. On the census, people self-identify both their race and ethnicity.

industries, which include a wide range of categories including health care and social assistance, retail trade, accommodation and food services, real estate, professional and technical services, administrative and waste services, transportation and warehousing, and finance and insurance (listed in order of the number of jobs provided). An additional nine percent of jobs are in government, with most (72 percent) provided by local government, followed by federal and then state government. The average wages for these jobs vary widely by specific type of job but average $55,000 for the non-services sector, $50,000 for the services sector, and $61,000 for government. Jackson County (2023) reports that the top six employers in the area are Amy's Kitchen, Asante Health System, Harry & David, Lithia Motors Inc., Pacific Retirement Services, and Providence Health System. Ashland is the home of Southern Oregon University, with more than 5,000 students and 37 areas of study. SOU and Rogue Community College also have campuses in Medford.

The average per capita income of residents employed in 2021 was $56,842, lower than the statewide average of $61,596. A higher proportion of county individuals (13.5 percent) than residents statewide (12.1 percent) live below the poverty level. Under BLM policy, 33 percent of residents are considered low-income, compared to 29 percent statewide.[6] Of residents' total personal income, half is from labor sources and half from non-labor, proportions comparable to those statewide but with a slightly higher proportion of non-labor income. Non-labor income consists of sources such as income from investments, Medicare and social security payments, and hardship-related transfer payments such as SNAP (Supplemental Nutrition Assistance Program, formerly known as food stamps) and Medicaid. A higher percentage of Jackson County residents reported hardship and age-related payments than individuals statewide, consistent with an older population and higher proportion of low-income residents.

Klamath County

More than half of the County is federal land (57 percent), with almost 80 percent of the federal land managed by the Forest Service and about 10 percent managed by the BLM. The county population in 2021 was 70,164, an increase of about 10 percent from 2000. The county seat and largest city is Klamath Falls, which had a population of 21,710 in 2021. In 2021, the median age of county residents was 41, slightly higher than the median for Oregon residents (40). Of the population 25 years and older, 21 percent had a bachelor's degree or higher level of education, compared to 35 percent statewide.

About 83 percent of county residents reported their race as white, compared to about 81 percent of Oregon residents. About one percent or less reported their race as Black or African American, Asian, or Native Hawaiian or other Pacific Islander, and eight percent said they were two or more races. All of these percentages were lower than those for Oregon residents as a whole. Almost four percent reported being American Indian, primarily members of the Karuk Tribe, compared to just over one percent statewide. Fourteen percent reported being Hispanic or Latino (of any race), about the same percent as reported by Oregon residents. Considering both race and

[6] The BLM follows the EPA (https://www.epa.gov/ejscreen/overview-socioeconomic-indicators-ejscreen) in defining low-income individuals as those who live at or below 200% of the poverty threshold. For more information, see the BLM Environmental Justice Implementation IM (https://www.blm.gov/policy/im2022-059) and attachment.

ethnicity, 76 percent of county residents reported being white and not Hispanic, so the total minority population is 24 percent, compared to 26 percent statewide.

Out of the 31,538 jobs in Klamath County in 2021, 18 percent were in non-services industries, with the majority in construction, manufacturing and farming. About 66 percent were in services-related industries, which include a wide range of categories including health care and social assistance, retail trade, accommodation and food services, other services, real estate, professional and technical services, and transportation and warehousing. and finance and insurance (listed in order of the number of jobs provided). An additional 15.5 percent of jobs were in government, with most (72 percent) provided by local government, followed by federal and then state government. The average wages for these jobs vary widely by specific type of job but average $50,832 for the non-services sector, $41,090 for the services sector, and $56,777 for government. Klamath County reports that the top three employers in the area are Sky Lakes Medical Center, the Klamath County School District and Jeld-Wen, which manufactures doors and windows. (https://businessviewmagazine.com/klamath-county-oregon-rural-ready/)

The average per capita income of residents employed in 2021 was $48,050, lower than the statewide average of $61,596. A higher proportion of county individuals (19 percent) than residents statewide (12.1 percent) live below the poverty level. Under BLM policy, 42 percent of residents are considered low-income, compared to 29 percent statewide. Of residents' total personal income, 53.5 percent half is from non-labor sources and 46.5 from non-labor, a slightly higher proportion of non-labor income compared to statewide percentages. Non-labor income consists of sources such as income from investments, Medicare and social security payments, and hardship-related transfer payments such as SNAP and Medicaid. A higher percentage of Jackson County residents reported hardship and age-related payments (31 percent) than individuals statewide (19 percent), consistent with an older population and higher proportion of low-income residents.

Two large higher educational institutions are located in Klamath County: the Oregon Institute of Technology (759 degrees awarded in 2020); and Klamath Community College (309 degrees).

Siskiyou County

Almost 2/3 of the County is federal land (63 percent) with most (92 percent) of the federal land managed by the Forest Service, and just three percent managed by the BLM. The county population in 2021 was 44,118, about the same as in 2000. The county seat and largest city is Yreka, which had a population of 7,807 in 2021. In 2021, the median age of county residents was 47, 10 years above the median for California residents (37). Of the population 25 years and older, about 21 percent had a bachelor's degree or higher level of education, compared to 35 percent statewide.

About 82 percent of county residents reported their race as white, compared to about 52 percent of California residents. About two percent reported their race as Black or African American (compared to six percent statewide), 1.5 percent as Asian (compared to 15 percent statewide), and nine percent said they were two or more races (11 percent statewide). Just over 3 percent (3.4) percent reported being American Indian, compared to one percent statewide. Thirteen percent reported being Hispanic or Latino (of any race), compared to 40 percent statewide.

Considering both race and ethnicity, 75 percent of county residents reported being white and not Hispanic, so the total minority population in Siskiyou County is 25 percent, far lower than the 64 percent in California.

Out of with the majority the 20,789 jobs in Siskiyou County in 2021, 17 percent were in non-services industries, nearly all in farming, construction, and manufacturing. About 60 percent were in services-related industries, which include a wide range of categories including health care and social assistance, retail trade, accommodation and food services, other services, real estate, administrative and waste services, professional and technical services, and. and finance and insurance, arts, entertainment and recreation, and transportation and warehousing (listed in order of the number of jobs provided). An additional 20 percent of jobs were in government, with most (74 percent) provided by local government, followed by federal and then state government. The average wages for these jobs vary widely by specific type of job but average $54,617 for the non-services sector, $41,441 for the services sector, and $56,475 for government. The county is home to College of the Siskiyous, a public community college with campuses in Weed (main campus) and Yreka, and is the only college in the county. The College awarded about 400 degrees in 2020 (https://datausa.io/profile/university/college-of-the-siskiyous).

The average per capita income of residents employed in 2021 was $52,368—much lower than the statewide average of $76,614. A higher proportion of county individuals (17 percent) than residents statewide (12 percent) live below the poverty level. Under BLM policy, 38.4 percent of residents are considered low-income, compared to 28.5 percent statewide. Of residents' total personal income, 58 percent is from non-labor sources, much higher than the California percentage of 37 percent. Non-labor income consists of sources such as income from investments, Medicare and social security payments, and hardship-related transfer payments such as SNAP and Medicaid. A higher percentage of Siskiyou County residents reported hardship and age-related payments (34 percent) than individuals statewide (15 percent), consistent with an older population and higher proportion of low-income residents.

Environmental Justice

Environmental Justice (EJ) is the fair treatment and meaningful involvement of all potentially affected people—regardless of race, color, national origin, or income—when the federal government develops, implements, and enforces environmental laws, regulations, and policies:

> Fair treatment means that no group should bear a disproportionate share of the adverse consequences that could result from federal environmental programs or policies.
>
> Populations of particular concern are minority, low-income, and tribal communities.
>
> Meaningful involvement means that EJ populations have a voice when we make decisions that could affect their well-being.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires each federal agency to "identify and address . . . disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States." This includes Tribes.

To comply, federal agencies must pay particular attention to potential impacts of agency decisions on minority and low-income populations. The BLM is required to identify low-income populations that may constitute environmental justice populations and to consider whether BLM management decisions may result in disproportionately high and adverse human health or environmental effects to these populations.

A low-income population is either a group of individuals living in geographic proximity to one another, or a geographically dispersed/transient set of individuals (such as migrant workers or Native Americans) who experience common conditions of environmental exposure or effect. A location has a low-income population if 50 percent or more of its residents are low-income; the percentage of low-income residents is the same or higher than that of a reference area; or other data indicate a low-income population is present.

Based on the County data presented in the previous sections, all three counties are considered to be environmental justice populations based on their low-income status. In addition, American Indians in Klamath and Siskiyou Counties are considered to be environmental justice populations.

6.18 Soil Resources

6.18.1 Current Conditions

The Natural Resources Conservation Service (NRCS) performed a complete inventory of soils within the planning area in 1993 (NRCS Soil Survey). The inventory is public-facing and can be found either at https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx or at https://casoilresource.lawr.ucdavis.edu/gmap/. (USDA 2019). The survey covers dozens of soil properties such as, but not limited to, erosion potential, taxonomy classifications, and surface texture. No updates are currently planned for any NRCS soil survey within the planning area.

Other relevant datasets used to evaluate current conditions of soil within the planning area include rangeland health assessments, timber production capability classification mapping, and other field observations that have been performed on a project-by-project basis. These datasets are generally not as extensive as the NRCS survey, and measure high specific soil criteria, i.e., a forest stand's suitability for sustainable harvest, which is only relevant to the current management situation in specific contexts such as landslide susceptibility management situation in specific contexts such as landslide susceptibility.

In general, soils within the planning area are highly variable, representing the area's biological and geological diversity. Shallow rocky soils are prevalent and support a variety of ecosystems depending on the prevailing climate and hydrogeographic features ranging from wetland habitat to dry arid scrubland. Deep clay soils support oak savannah ecosystems with high organic matter content and water holding capacity. Overall, seven of the twelve soil orders are within the planning area which represent multiple soil series. All soils regardless of taxonomic classification are prone to erosion given certain conditions. Steep slopes, logging, and fire have the potential to adversely affect long-term soil productivity. NRCS maps show which soils are at risk for erosion based on a combination of surface cover, surface texture, and slope percentage.

Measuring soil health is a complex, multidisciplinary, and multi-factorial process, but some generalizations can be made based on rapid visual assessments from trained individuals. Forest vegetation management projects are monitored using a Forest Soil Disturbance Monitoring Protocol developed by the Forest Service (Page-Dumroese et al. 2009) Grazing allotments and other rangelands are monitored using the BLM range health assessment protocols. While specific criteria vary by method, both monitoring protocols measure soil properties such as compaction and topsoil horizon impacts.

Past logging activities have left substantial impacts on the landscape, some of which are still present today in limited areal extents. Many of the old stands that were being managed for timber production have compacted, or in some cases tilled/rowed, soil. Forest floor impacts are also evident in the form of patches of bare soil, or extensive mats of undecomposed pine needles. Both these physical changes to the soil show reduced vegetation growth because of multiple factors, but primarily a decrease in water holding capacity and a non-functional seedbed. The result is patches of dense trees which are chronically drought stressed and prone to fire, disease, and pests. In general, if there have been past logging activities, the soils likely bare some evidence of disturbance. Specific acreages of detrimental disturbance are unknown, though the sections above detail acreages of past logging activities. Not every action in the past has caused detrimental soil disturbance, and while some detrimental effects are still present, most of the disturbances have become less pronounced over time.

Grazing in the planning area has been reduced since its inception, however there are effects to soil conditions from both current and past use. The effects are concentrated around a limited number of waterways within the planning area in the form of bare patches of compacted ground. Fencing has been effective as a tool to limit the effects of cattle grazing but maintenance and monitoring are both critical to preventing further damage to soil resources. Currently, the impacts of grazing are not extensive relative to the size of the planning area, but areas that are impacted show strong signs of a degradation in overall soil health.

Wildfire is an ever-present threat in the planning area. While low to mid severity fires have a much lower impact and potentially beneficial effect to soil resources, the steady increase in fuel loading within the Monument boundary has increased the likelihood of a high severity wildfire. Past high severity fires have left soils in a state which does not support the same ecosystem pre-fire and would most likely not support a pre-fire ecosystem without restoration projects aimed at accelerating the transition to an old growth environment. Previous sections above detail the extent of recent fire impacts, where acreages of high fire severity are detrimentally impacted for the foreseeable future.

6.18.2 Trends

Trends in soil health and productivity vary within the planning area based on past use history. Most of the planning area's soil resources remain intact, productive, and have not drastically deviated from the natural conditions expected in absence of human activities.

Soils that were harvested, planted, or otherwise used for timber extraction purposes, including but not limited to plantations and roads, would typically not reach a more natural and functional state without intervention depending on the severity of the initial impact. For example, soils that

have experienced compaction below 30 cm did not recover for the duration of a 30-year monitoring study of forested soils (Page-Dumroese et al. 2021). Within the planning area itself, there remains soil impacts after 40 years in the form of tilled and rowed forest soils visible from LiDAR as shown in **Figure 6-14** below.

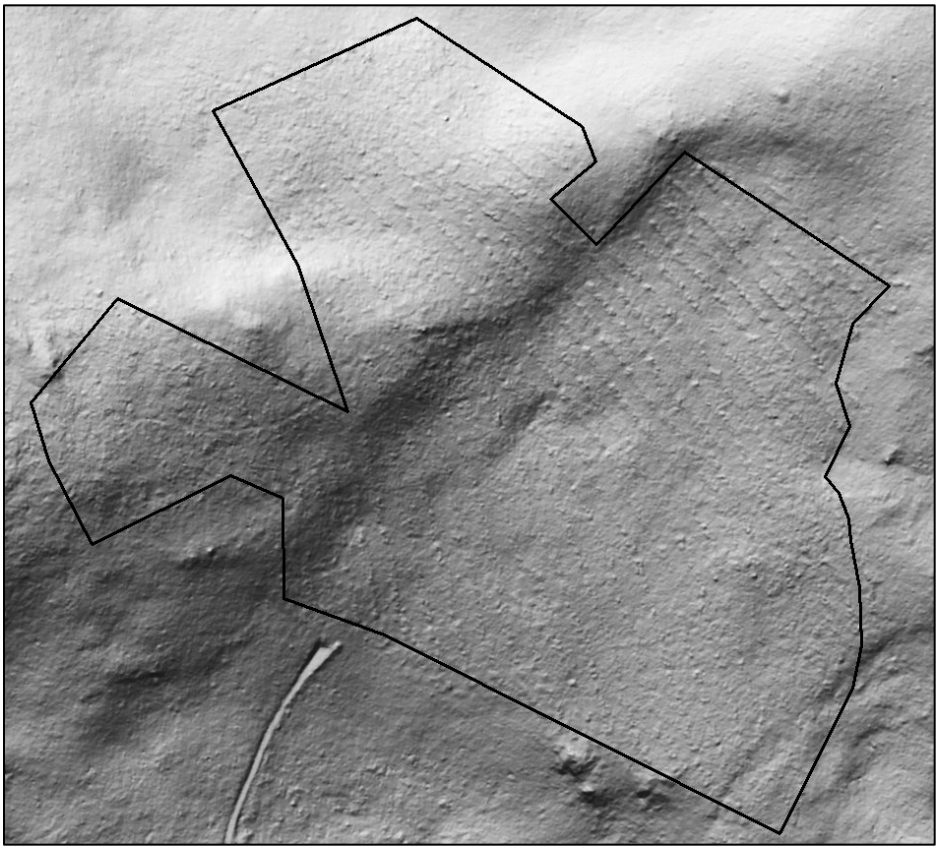

Figure 6-14. Tilled and rowed forest soils are still visible 40 years after harvest, using LiDAR.

While intuitively the trend in soil health and productivity in such areas should be flat, the chance of a high severity, stand replacing wildfire is higher in forest stands seeing effects from past use.

Soil physical properties (i.e., bulk density) recover from grazing impacts when livestock are excluded from areas for as little as two decades (Dumroese 2020). This places some areas within the planning area (i.e., retired grazing allotments) on an upward trend of recovery in terms of direct grazing impacts. However, impacts to rangeland soils from climate change, droughts, etc. in the form of an increase in exposed bare soil in dry meadows and decreased resilience to other forms of disturbance are occurring (Whitridge et al. 2015).

6.18.3 Forecasts

Climate change would continue to impact soil resources. For example, while changes to rain patterns are more unpredictable than increases to temperatures, hotter climates would still mean more evapotranspiration and a depletion of soil moisture.

The BLM expects human activities to continue to disturb soil resources and therefore affect soil health and productivity in all ecosystems.

6.19 SPECIAL STATUS PLANTS

6.19.1 Current Conditions

The Cascade-Siskiyou National Monument, located at the confluence of the Klamath, Cascades, Eastern Cascade Slopes and Foothills Ecoregions, has a unique geology, climate, and topography that contributes to the presence of many rare and endemic plants and fungi. Extreme southwest Oregon and adjacent northern California have one of the highest rates of plant endemism in the United States. **Table 6-11** shows the 31 Special Status Plants Species known to exist within the planning area, including one federally endangered plant, Gentner's fritillary (*Fritillaria gentneri*). Bureau Special Status Species include species that are federally listed or proposed, and/or Bureau Sensitive (USDA FS-USDI BLM 2021).

The planning area is outside the known range of the federally endangered plants McDonald's rockcress (*Arabis macdonaldiana*), and Cook's lomatium (*Lomatium cookii*). The planning area is also outside the known range for federally proposed species, large-flowered wooly meadowfoam (*Limnanthes floccosa* ssp. *grandiflora*). These species are not expected to occur here. If these species are documented in the future within the planning area, they would be managed according to the Endangered Species Act.

Table 6-11. Special status plants found within the planning area

Common Name	Scientific Name	BLM/USFWS Status[a]	Nature Serve Ranking[b]
Peninsular onion	*Allium peninsulare*	BSS	G5/S1
Schofield's rock moss	*Andreaea schofieldiana*	BSS	G2/S1
Klamath Basin milkvetch	*Astragalus californicus*	BSS	G3/S1
Gambel's dwarf milkvetch	*Astragalus gambelianus*	BSS	G5/S1
Beautiful Bryum moss	*Bryum calobryoides*	BSS	G4/S2
Greene's mariposa lily	*Calochortus greenei*	BSS	G3/S3
Yellow star-tulip	*Calochortus monophyllus*	BSS	G3/S1
Capitate sedge	*Carex capatata*	BSS	G5/S2
Toothless threadwort	*Cephaloziella spinigera*	BSS	G4/S1
Coastal lipfern	*Cheilanthes intertexta*	BSS	G5/S1
Clustered lady's slipper	*Cypripedium fasciculatum*	BSS	G4/S2
Red larkspur	*Delphinium nudicaule*	BSS	G4/S2
Gentner's fritillary	*Fritillaria gentneri*	FE/BSS	G2/S1
Greater showy stickseed	*Hackelia bella*	BSS	G3/S1
Bolander's sunflower	*Helianthus bolanderi*	BSS	G4/S2
California globe-mallow	*Iliamna latibracteata*	BSS	G2/S2
Woolly meadowfoam	*Limnanthes floccosa ssp. bellingeriana*	BSS	T3/S2
Slender nemacladus	*Nemacladus capillaris*	BSS	G4/S1
Western yampah	*Perideridia erythrorhiza*	BSS	G2/S1
Austin's popcornflower	*Plagiobothrys austiniae*	BSS	G4/S2
Fragrant popcornflower	*Plagiobothrys figuratus ssp. corallicarpus*	BSS	G4/S4
Rhizome bluegrass	*Poa rhizomata*	BSS	G3/S1
Liverwort	*Porella bolanderi*	BSS	G3/S1
Rock moss	*Racomitrium depressum*	BSS	G3/S1
California plumseed	*Rafinesquia californica*	BSS	G5/S2
Southern Oregon buttercup	*Ranunculus austro-oreganus*	BSS	G3/S3
Hollyleaf redberry	*Rhamnus ilicifolia*	BSS	-
Bloom moss	*Schistidium cinclidodonteum*	BSS	G2/S2
Drooping bulrush	*Scirpus pendulus*	BSS	G5/S1
Parish's nightshade	*Solanum parishii*	BSS	G4/S2
Dotted watermeal	*Wolffia borealis*	BSS	G5/S1

[a] BSS = Bureau Sensitive Species; FT = Federally Endangered.
[b] G = Global Rank; S = State Rank; T = Infraspecific Taxon;
1 = Critically Imperiled; 2 = Imperiled; 3 = Vulnerable; 4 = Apparently Secure; 5 = Secure.

Federally Listed Plants

Gentner's fritillary (*Fritillaria gentneri*) was listed by the U.S. Fish & Wildlife Service as endangered in January 2000 (USDI BLM 1999b). Consultation with the U.S. Fish & Wildlife Service on any federal action that may affect this species, or its habitat is required. Gentner's fritillary is endemic to southwestern Oregon in Jackson/Josephine counties and northern California in Siskiyou County, California. In Oregon it is primarily known from the area around Jacksonville, the Little and Middle Applegate River, east to the planning area, north to Big Butte Creek near Butte Falls, and west to near Pickett Creek. Only two populations occur in California within the planning area.

This rare lily is rather large, between 8 - 34 inches tall with bright reddish-purple flowers. It looks very similar to several 'common' red fritillaria lilies, (*Fritillaria affinis* and *Fritillaria recurva*), making cursory identification by lay persons problematic. Unless it is flowering, the rare Genter's fritillary is nearly indistinguishable from the more common species. These species often occur together in the same habitats. Gentner's fritillary grows in lower elevation (less than 4500 feet) in mixed conifer/hardwood forests, open oak woodlands, chaparral, and grasslands, often in the transitional habitat, or the 'ecotonal edge' between these discrete plant communities, often along ridgelines.

As a result of its proximity to lower elevation valley bottoms and foothills, this plant is susceptible to habitat alteration from agricultural uses, rural and urban development, impacts from grazing, road building, forest management, and recreation, especially on private lands. While this species has protection on federal and state public lands, the Endangered Species Act of 1973 does not provide protection for this species on private lands. This species is also subject to incidental collection (wildflower picking) by visitors, both flowers and bulbs.

The planning area covers the area identified as Recovery Unit 4 in the Recovery Plan for *Fritillaria gentneri* (USDI FWS 2003).

Recovery Unit 4 is the most easternmost and one of four Recovery Areas identified. A 2019 BLM monitoring effort documented 1,632 flowering Gentner's fritillary plants at 12 sites in Recovery Unit 4 (Pacific Crest 2020). The 1,632 flowering Gentner's fritillary represents a 26 percent increase from 2018 totals, and an increase of 72 percent of the average (950) for the eleven previous years (2008 to 2018) of monitoring (Pacific Crest 2020). The DRAFT Species Status assessment (USFWS 2022) calculates there are currently approximately 303,000 Gentner's fritillary individuals, across all of the 4 Recovery Units. Recovery Unit 4, covered by the Monument, accounts for 62% of the total, with approximately 188,000 Gentner's fritillary individuals.

Bureau Sensitive Plants

Peninsular onion (*Allium peninsulare*) is a perennial bulb which sends up approximately 1-foot tall leaf and flower stems each year. It is distributed to central/southern California and northern Baja California. It reaches it northern extent in the CSNM near Soda Mountain north into Howard Prairie, representing 15 discrete occurrences. In the CSNM it grows in vernally wet meadows in conifer forest moist to dry fine/clay soils.

Schofield's Rock Moss (*Andreaea schofieldiana*) is distributed along the pacific coast from California to Southern British Columbia. It grows on rock outcrops and forms low mats on shaded volcanic rocks. It is only known from one occurrence in the CSNM on Soda Mountain.

California milk vetch (*Astragalus californicus*) was only recently discovered in Oregon in the Scotch Creek RNA. Other populations occur further south into northern California. Undocumented occurrences in grasslands in the Monument are likely. Its habitat is in blue-bunch wheatgrass / Idaho Fescue grasslands, on southerly aspects in rocky, shallow soiled sites. Some of California milk vetch sites in these grasslands are becoming dominated by yellow star-thistle, and an apparent competitive relationship between these two species has been documented.

Gambel's dwarf milkvetch (*Astragalus gambelianus*) is a small (less than 12 inches), annual milkvetch with distinctive black hairs in the inflorescence and lavender to blue flowers from March to June. It is distributed from Jackson County in Oregon, south to northern Baja California. It has 15 occurrences in the CSNM. It grows in open, grassy areas and clearings in chaparral below 4750 ft (1450 m).

Beautiful Bryum Moss (*Bryum calobryoides*) is a bright green moss that grows in dense mats or cushions. It is distinguished by branches that are smoothly cylindric and leaves that are so closely overlapping they resemble catkins (julaceous). It is distributed in western North America with approximately 80 known occurrences. There is one occurrence in the CSNM. Calcareous damp soil and rocks, moderate to high elevations 3000-10,000 ft (1000-3000 m). Threats to alpine populations include recreational impacts (off trail hikers, ORVs and rock climbers), and climate change.

Greene's mariposa lily (*Calochortus greenei*) is a rare, beautiful, local endemic species found in open shrub / Oregon white oak woodlands along the California – Oregon Border and south into the Shasta Valley. The soils are usually deep and high in clay content. Reproduction is limited by the browsing removal of the flowers and fruits which appear during mid-summer and are quite palatable to both cattle, deer, and rabbits. This species is at risk from horticultural collection and grazing pressure from deer, rabbits, and livestock. Much of this species habitat in low and mid elevation has been altered by rural development, impacted by livestock grazing, and noxious weed invasion, all of which have reduced the species viability in these areas. Cattle grazing, if properly managed, does not appear to be a threat, however, uncontrolled, or poorly controlled grazing can severely impact the species. There are populations near Hutton Creek/ Pilot Rock, in the Oregon Gulch RNA, along Keene Ridge, and in the oak woodlands on Agate Flat. **Map 6-2**. Cascade-Siskiyou National Monument – Existing Designations shows the location of the Mariposa Lily Botanical Area.

Yellow cat's ear (*Calochortus monophyllus*) is a perennial lily with a flexuous stem and bright yellow bell-shaped flowers that bloom in April and May. It is distributed from Jackson County Oregon in the north, through the western slopes of the Sierra Nevada in California. *It reaches its northern limit in Grizzley Peak and Sam's Valley, represented by one distinct occurrence.* In the CSNM it grows on wooded slopes in clay-loam soils, sometimes in serpentine from 1,600-5,900 feet elevation.

Capitate sedge (*Carex capatata*) is a loosely cespitose, perennial sedge with only one spikelet per inflorescence, fruiting between July and September. It is distributed between the eastern Cascades and western Basin and Range in Deschutes, Harney, Jackson, Jefferson, Klamath, and Lake Counties Oregon. It also occurs in California and Nevada. These southern, alpine occurrences are disjunct from the mires and heaths of its northern, boreal range, leading to some taxonomic questions. Capitate sedge grows in wet or seasonally wet meadows and bogs, often alpine but also at lower elevations 4500-9500 ft (1400-2900 1400m) in cold air drainages or cold springs, usually where snowpack is shallow, but the ground remains moist in summer due to snowmelt. It is found often on sandy, acidic soils. It is known from four occurrences on the CSNM.

Spiny/toothless threadwort (*Cephaloziella spinigera*) is a small, leafy liverwort with deeply bilobed leaves that often have small, sharp teeth near the leaf base. Plants are slender, pale green to purplish red, creeping over other bryophytes. Distributed in boreal and montane regions in the northern hemisphere and reaching its southern range in northern California. At low elevations, liverworts are active and identifiable during the rainy season, October through May. Plants growing at higher elevations where snow lies late (above 5000 ft) may be active in late summer and early fall. It is known from one occurrence at Bull Swamp in Klamath county, Oregon. This species is found in bogs and fens. Threats include wetland disturbances that change the hydrology of its boggy habitat.

Coastal lipfern (*Cheilanthes intertexta*) is a small multi-branched perennial fern, ascending and creeping in rock crevices. It is the only lipfern in our area with round segments (ovate leaves). It is distributed in Southern Oregon, California, and Nevada. In Oregon it is known from the Klamath Mountains in Douglas and Jackson counties, growing in rocky areas from foothills to mid-montane at elevations of 1,000-9,000 ft (300-2800 m). Known from Oregon on andesite volcanic rock. There are 25 occurrences in CSNM.

Clustered lady's-slipper (*Cypripedium fasciculatum*) is found in isolated, widely scattered and usually small populations in the west from the Rocky Mountains in Colorado to the Pacific coast. Mid to late-successional forests with canopy closures greater than 60 percent appear to be the optimum habitat for this species. This species has been managed both as a Bureau Special Status plant, and a Survey and Manage species under the Northwest Forest Plan. *Cypripedium fasciculatum* is a slow-growing, long-lived orchid with an obligate mycorrhizal association and an arguable dependence on fire. Two populations of *C. fasciculatum* have been located in the Monument. One vigorous population occurs in a mixed conifer-madrone stand on a steep slope above Emigrant Creek and the other population occurs in old growth Douglas-fir near the edge of a clearcut in the Lincoln Creek drainage. *Cypripedium fasciculatum* was also collected in 1923 at Johnson Prairie but has not been relocated and may be extirpated.

Red-orange larkspur (*Delphinium nudicale)* is an herbaceous perennial that flowers from a leafy base March to June. The irregular red-orange flowers distinguish it from others in our area. It is distributed in northern California and southern Oregon. In Oregon it is limited to Douglas, Jackson, and Josephine counties. It is known from four occurrences in the CSNM. Grows in talus and well-drained gravelly soils on rocky slopes, either in the open or among shrubs and woods at elevations less than 8500 ft.

Beautiful stickseed (*Hackelia bella*) is a southwest Oregon and northern California endemic, found in forest openings, grasslands, and along streambanks. This species is most likely under-reported in the Monument. It is known to occur in grassy meadows, and openings in white fir forests around Table and Chinquapin Mountain. It is not found in the southern portions of the Monument.

Baker's globemallow (*Iliamna bakeri*) is known for the west Cascades and Modoc plateau in California, and the Klamath Mountains in southwest Oregon. Its habitat in its range is open areas in juniper woodlands, and lava beds. Four occurrences are documented in the Monument, two in clearcuts (white fir community types), one along road edge, and one in a rocky 'opening in a white fir (*Abies concolor*) community'. While it appears this species can be found in early successional or disturbed habitats, the existing populations are very small. Additional sites are likely in the southern end of the Monument adjacent to the California border.

California hollyhock or broad-bracted globe-mallow (*Iliamna latibracteata*) is perennial with rose to lavender flowers that blooms in June and July. It is distributed in southwestern Oregon and northwestern California. Grows in moist, often disturbed areas in otherwise shady places such as riparian corridors in coniferous forests at 1500-6000 ft (500-2000 m). It has three occurrences in CSNM. Threats include roadside maintenance, grazing, logging, weeds, trampling, clearing and recreational use. Succession and lack of natural disturbance regimes are also threats.

Bellinger's meadow-foam (*Limnanthes flocosa* var. *bellingeriana*) occupies a special habitat associated with high winter and spring water tables and impervious basalt subsoil layer. Soils are wet for three or more months of the year. Plants grow in or near the edges of vernal pools. This plant is a narrow endemic found on impervious basalt areas in the vicinity of Lincoln, in the Oregon Gulch RNA, and in tributaries of Jenny creek. The site near Lincoln is of botanical importance as the type locality for the species (the place where the designated nomenclatural type was collected).

Pale monardella (*Monardella glauca*) is known from one area in the Monument near Chinquapin Mountain in open mixed conifer forest (white fir - Douglas-fir) on rocky south slopes at 5200 feet. More occurrences are known in Josephine County, and south into northern California, and east into the great basin into Nevada.

Common nemacladus (*Nemacladus capillaris*) is a species found in the Sierra Nevada Mountains of California, and in the Monument. It is known from the four sites in xeric, rocky openings in mixed conifer forests (Juniper, white fir, and Douglas-fir). Two of the sites have very few plants (less than 10) and the other two number in the hundreds.

Red-root or Western Yampah (*Perideridia erythrorhiza*) is a small, perennial member of the carrot family with panicles of small white flowers on solitary flowering stems (2-3 ft) and distinctive tuberous roots (clustered and reddish brown). Known only from four counties in southwestern Oregon. There are 22 occurrences, including one occurrence in a "special interest area". Woodland, mixed forest, forest edge, old field, and grasslands. Lower elevations (less than 1525 m) in poorly drained, heavy clay soils; moist prairies with tufted hairgrass and California

oatgrass. Threatened by housing development, agricultural development, grazing, herbicides, competition with invasive weeds and altered hydrology due to nickel mining.

Austin's spiny-nut popcorn flower (*Plagiobothrys austiniae*) is a small (6-18 in) annual borage with tiny white flowers in April and May. It can be distinguished from other popcorn flowers by its spiny nutlets. It is distributed in vernally wet depressions from Jackson County Oregon and through the Central and San Joaquin Valleys in California. The CSNM has one known occurrence. It grows in valley grasslands, wet areas in thin, rocky clays, and along vernally wet, disturbed edges of roads and trails at 1000-2500 ft (300-700 m). Threats include destruction of vernal pool habitat for agriculture and urban development, and by use of off-road vehicles. Climate change that results in the earlier drying of vernally wet areas also poses a threat.

Coralseed allocarya (*Plagiobotyrys figuratus* ssp. *corallicarpus*) grows in open vernal creeks near Lincoln. The Lincoln population is unusual for its size (thousands), and isolated from other known populations in Sams Valley, north of Medford. Interference with surface hydrology would put the population at risk.

Timber/rhizome bluegrass (*Poa rhizomata*) is a short-rhizomatous, loosely cespitose, dioecious perennial blue grass that blooms April-July. It is distributed in the Klamath Mountains in southern Oregon and Northern California. It reaches its northern extent in the CSNM with 20 known occurrences. It grows in rocky gabbro or serpentine/peridotite soils in montane, mixed conifer forests between 1800-7000 ft (500-2200 m). Threats include swamping by weedy species of poa.

Bolander's Scalemoss *(Porella bolanderi)* is a leafy. It is endemic to western North America and known only from California, Oregon, and Utah. As of 1983, *Porella bolanderi* was known from 19 counties in California and one county each in Oregon and Utah. The liverwort grows on rocks and the bark of living trees, frequently occurring with *P. navicularis*. One occurrence in the CSMP.

Rhizome bluegrass (*Racomitrium depressum*) Growing on rocks in drainage channels. Largely confined to California, it has recently been found in Jackson County Oregon and Nevada just east of Lake Tahoe.

Desert plumeseed or California chicory (*Rafinesquia californica*) is a sparse, annual daisy with milky sap in the stem that can be 1-5 feet tall. Produces many white flowerheads from April-August that are often rose-tinted on the underside. Seed heads are reminiscent of dandelions. Flowers attract butterflies and other small insects, and the seeds may be eaten by birds. It is distributed in Southern Oregon, California, Nevada, Arizona, and Baja Mexico. In Oregon it occurs in the Klamath Mts in Jackson and Josephine counties, and possibly Malheur County. There are six occurrences in CSNM. It grows in open areas in oak woodlands, chaparral, and desert scrub, at (100-1500m) often coming in after fire since seeds germinate more readily in the presence of burned wood. Threats include habitat invasion by invasive weeds.

Southern Oregon buttercup (*Ranunculus austro-oreganus*) is a perennial with a slender stem, erect or ascending, from a robust rootstock that is not tuberous. Flowers are yellow on the upper surface and rust colored on lower blooming in April-May. Narrow endemic of central Jackson

County, Oregon. Locally abundance with 34 occurrences on the CSNM. In vernal pools and grassy meadows of oak woodlands 1500-2000 ft (500-700 m). Threats include agriculture, hybridization, and climate change.

Hollyleaf redberry (*Rhamnus ilicifolia*) is an evergreen shrub to 12 ft tall (4 m). This shrub has 4 inconspicuous, yellowish-green sepals and no petals, flowering in March-June. It is distributed throughout California, also found in Nevada, Arizona, and Baja Mexico. Jackson County Oregon is the northern limit of its range, with 2 occurrences in the CSNM. It grows on serpentine and serpentine-influenced soils in chaparral and oak woodlands below 5000 ft (1700 m).

Rock Moss (*Schistidium cinclidodonteum*) is unbranched and erect, forming an open, mounded colony (acrocarpous) of olive, brownish to nearly black stems. The sporophytes emerge from the tips of the plant and mature in late spring. Grows on rocks along watercourses at high elevations (2000-3500 m). It is distributed in the Pacific Northwest and Europe. There are seven occurrences in the CSNM.

Drooping bullrush (*Scirpus pendulus*) is a cespitose perennial fruiting late June – August. Distributed throughout North America marshes with one occurrence in CSNM. It grows in marshes, wet meadows, river terraces and ditches, often associated with calcareous soils.

Parish's nightshade (*Solanum parishii*) is known from California and adjacent southern Oregon in dry chaparral and dry oak /pine woodlands. There are three sites within the Monument, each with fewer than ten plants. Two occur in old, open clearcuts in dry Douglas-fir /Oregon oak communities, and one in a dry wedge-leaf ceanothus-Klamath plum chaparral in the Scotch Creek RNA. Several other sites in southwest Oregon are in dry chaparral communities, and all are very small populations.

Dotted watermeal (*Wolffia borealis*) is a tiny floating perennial aquatic plant in the Duckweed family. Their boat shaped plant bodies float with their entire upper surface exposed above the water. Blooming June-December. Found in quiet freshwater ponds with high levels of organic material in temperate regions at 325-4250 ft elevation (100-1400 m). It is distributed throughout 4 Canadian provinces and 28 states in the United States, including Polk, Linn, Benton, Lane, Douglas, Jackson, and Klamath Counties of Oregon. CSNM has one occurrence.

6.19.2 Trends

A range of threats, including habitat degradation from improper livestock grazing, trampling, unauthorized off-highway vehicle use, and invasive plant spread, may affect individual species in different ways. However, the threat of climate change and its associated precipitation, wildfire, and herbivory effects may be the most significant threat faced by special status plant species. Little information is available documenting the current trends, habitat conditions, and population size of most special status plant populations.

6.19.3 Forecasts

As detailed above, monitoring for populations (and conservative population estimates) of the one federally listed plant species in the planning area (*Fritillaria gentneri*) indicates an overall trend of relatively stable to improving.

6.20 TERRESTRIAL WILDLIFE

6.20.1 Current Conditions

Wildlife species in the planning area use a broad spectrum of vegetation types, from high elevation red fir forests to low lying shrub chaparral. The distribution, quantity, and quality of these varied vegetation types directly influences the distribution and population size of each species in turn. A more thorough classification of habitats as they pertain to various wildlife species would encompass a spectrum of both biotic and abiotic characteristics. Vegetation types can readily be used as a proxy for habitats used by wildlife species and can even be correlated with specific life history functions in many cases (e.g., nesting, foraging). They are described below. Appendix C presents the species listed under the Endangered Species Act (ESA) or Bureau Sensitive species known or suspected to occur within the planning area.

Vegetation Types Represented in the Planning Area

Early Seral: Early seral habitat typically occurs from the time of disturbance at a site until approximately 10 years of age. This stage may be dominated by grasses and forbs or by sprouting shrubs or hardwoods. Conifers develop slowly at first and gradually replace grasses, forbs, or shrubs as the dominant vegetation.

Mid-Seral Closed: The mid-seral closed stage occurs with crown closure to the time when conifers would begin to die from competition, approximately age 11 to 30 years.

Mid-Seral Open: The mid-seral stage occurs from crown closure to the time when conifers begin to die from competition, approximately age 30 to 60 years. Stands are dense and dominated by conifers, hardwoods, or thick brush. Grass, forbs, and herbaceous vegetation decrease with increasing age.

Late-Seral Open: Late seral open stage occurs as conifers continue to die from competition and stand growth slows, approximately 61 to 100 years. Forest stands are dominated by conifers or hardwoods; canopy closure often approaches 100 percent. Stand diversity is minimal.

Late-Seral Closed: Structurally complex stands are defined as forests that are more than 50 years old, ≥ 12 trees per acre that are ≥ 20 inches diameter at breast height, and ≥ 2.1 trees per acre ≥ 40 inches diameter at breast height. This structural stage is associated with the Late-Closed successional class.

Oak woodlands: Oak woodlands are dominated by drought tolerant oak species. Usually occurring on sites not hospitable to conifer species due to aspect, soil type, elevation, and annual precipitation regime.

Shrub steppe: Shrub steppe habitats are dominated by shrub species. These sites are generally not hospitable to most tree species although some oaks and juniper may be present.

Riparian: Habitats proximal to water bodies (streams, rivers, lakes, ponds, etc.). Species composition in riparian habitat favors deciduous and coniferous species tolerant of or dependent upon the moisture provided by this location on the landscape.

Meadows: Open areas dominated by grasses and forbs with occasional small shrubs and trees. Typically limited by soil type, aspect, elevation, or precipitation regimes, meadow habitats occur at a variety of locations across the landscape.

6.20.2 Trends

Limited information exists on most wildlife species and their habitats within the planning area. For most wildlife species, population trends can be tied directly to vegetation types present on the landscape and to the quantity and distribution of these vegetation types. See Sections 6.22.2 and 6.23.2 for discussion on vegetation trends.

6.20.3 Forecasts

There are no significant anthropogenic changes anticipated within the CSNM. The exception to this is climate change. Climate-related changes may affect food, cover, and nest site availability for many wildlife species (e.g., loss of wetland habitat reducing suitable forage and dam materials for beaver, loss of foraging locations for peregrine falcons, loss of breeding habitat for amphibians) (Halofsky et al. 2018). Climate-related changes to abiotic features, such as precipitation regimes and temperature fluctuation patterns, may affect phenology in wildlife species and in the plant communities upon which they depend (Halofsky et al. 2018).

These changes can most readily be observed through monitoring of vegetation types on the landscape. The effects of climate change are likely to include the upward migration of plant communities. A correlating movement of associated animal species is anticipated in response to this change in vegetation. As the vegetation type upon which a given species depends increases or decreases in quantity a corresponding increase or decrease in species numbers would be expected. For example, fisher habitat is anticipated to increase slightly over the next 50 years (USDI BLM 2016b). Fishers are expected to expand from their current range to occupy habitat as it fills in areas currently lacking in habitat.

6.21 TRAVEL AND TRANSPORTATION

6.21.1 Current Conditions

The Cascade-Siskiyou National Monument includes approximately 113,506 acres of BLM-administered lands which are currently designated as either closed or limited to off-highway vehicles (OHV) under the current RMPs (SWO RMP, Appendix H, p. 279; CSNM RMP, pp. 92, 97, Redding RMP, pp. 34-35).

The transportation system within the planning area includes all roads, routes, and various types of recreational trails that provide access for both motorized and non-motorized forms of travel. Roads in the planning area vary from high-clearance primitive roads to paved highways. Oregon State Highway 66, also referred to as the "Green Springs Highway," and Interstate 5 intersect portions of the CSNM. Trails include the Pacific Crest National Scenic Trail, and a variety of other improved and primitive trails (e.g., Grizzly Peak, Hobart Bluff, Pilot Rock, and the Lone Pilot trails) that access monument features. The roads and trails are shown on **Map 6-7.** Cascade-Siskiyou National Monument - Transportation Network.

In total, there are approximately 158 miles of trails, and approximately 800 miles of road in the planning area.

Presidential Proclamations 7318 and 9564, which designated and enlarged the CSNM, provide direction to the BLM regarding travel and transportation. Proclamation 7318 states that “The management plan shall include appropriate transportation planning that addresses the actions, including road closures or travel restrictions, necessary to protect the objects identified in this proclamation." Proclamation 9564 states that

> “The Secretary of the Interior (Secretary) shall manage the area being added to the monument through the Bureau of Land Management as a unit of the National Landscape Conservation System, under the same laws and regulations that apply to the rest of the monument, except that the Secretary may issue a travel management plan that authorizes snowmobile and non-motorized mechanized use off of roads in the area being added by this proclamation, so long as such use is consistent with the care and management of the objects identified above.”

The BLM does not anticipate designating any new roads or trails until completion of the RMP and the subsequent travel management plan. Should such designation be necessary, in addition to ensuring conformance with the existing plan and the Proclamations, the BLM would demonstrate adherence to 43 CFR 8340, BLM Manual 1626, and Section A.5 of the BLM Director’s Interim Management of the CSNM Memorandum (USDI BLM 2022). Specifically, and per the requirements of 43 CFR 8342.1, the BLM will ensure that:

a. Areas and trails shall be located to minimize damage to soil, watershed, vegetation, air, or other resources of the public lands, and to prevent impairment of wilderness suitability.
b. Areas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats. Special attention will be given to protect endangered or threatened species and their habitats.
c. Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors.
d. Areas and trails shall not be located in officially designated wilderness areas or primitive areas. Areas and trails shall be located in natural areas only if the authorized officer determines that off-road vehicle use in such locations will not adversely affect their natural, esthetic, scenic, or other values for which such areas are established.

The BLM will ensure the Cascade-Siskiyou National Monument RMP is consistent with the language in the Proclamation 7318 and 9564. The BLM will also develop an RMP implementation strategy to effectively implement the RMP that will address the prioritization and estimated schedule for completing all remaining implementation-level travel and transportation management planning and actions.

6.21.2 Trends

The trends for visitation to public lands overall have been increasing since the Monument was designated (see Section 6.15.2). The variety of recreational activities that occur require an efficient and maintained transportation system, which includes trailheads, parking, and well signed roads and trails capable of conveying visitors to and from the CSNM, while preserving CSNM objects and values.

The trends related to access needs have been increasing as well (see Section 6.9.2). As such, the use of BLM roads for access to adjacent private lands has also increased.

6.21.3 Forecast

The use of roads and trails by visitors to the planning area would continue to increase over the life of the plan. The BLM anticipates continued use of roads for access to private property (see Section 6.9.3)

6.22 VEGETATION – FOREST LANDS

6.22.1 Current Conditions

Forest vegetation within the planning area varies based on elevation, climate, and past disturbance history. These, along with relative trends and disturbance agents, result in a wide range of forest conditions, described below and shown on **Map 6-8**. Cascade-Siskiyou National Monument – General Vegetation Types. Forested plant communities in the planning area are comprised of mixed conifer/hardwood forest and conifer dominated forest.

Forest Cover Types

Within the planning area, it is helpful to be able to break forested plant communities down into more specific groups based on common characteristics. Potential Vegetation Types (PVT) classify sites based on the potential climax conditions of the site based on the current conditions. Within the planning area, these allow large areas with common characteristics to be broadly categorized. The modeling team for the RMPs for Western Oregon used the Integrated Landscape Assessment Project to derive the PVT to help delineate moist versus dry categories and to provide complete coverage of forest vegetation cover across the planning area. Appendix C of the PRMP/FEIS (USDI BLM 2016b, pp. 1163-1227), which is incorporated by reference, describes the assumptions applied to the vegetation modelling for use in the SWO ROD/RMP. This same data was used to differentiate forest moisture regimes in this RMP. **Table 6-12** lists the PVT groups of the Cascade-Siskiyou National Monument.

The primary PVT found in the planning area is white fir intermediate, which is widespread and can vary in composition based on stand level variation in slope, aspect, elevation, and soils. These areas are often characterized by the presence of Douglas-fir and ponderosa pine as dominant in the overstory while white fir/grand fir occupy codominant positions in the stand. On the eastern slopes of the Cascades, white fir and grand fir hybridize and can become the climax

species. Following disturbance, it is common for early successional stages to be dominated by dense shrubfields (Simpson 2007).

Table 6-12. Forested potential vegetation types of the Cascade-Siskiyou National Monument

CSNM Forest PVT Zones	Associated Tree Species
Ponderosa pine	Ponderosa pine, Oregon white oak, and incense-cedar
Douglas-fir - Dry	Douglas-fir, ponderosa pine, pacific madrone, California black oak, and incense-cedar
Douglas-fir - Moist (mixed conifer)	Douglas-fir, ponderosa pine, sugar pine, white fir, and incense-cedar
White fir	White fir, Douglas-fir, and red fir
Red fir	Red fir and white fir

There are several other PVTs within the planning area. In the higher elevations there are White fir cool, Shasta red fir-moist, and Mountain hemlock-cold/dry. Douglas-fir moist, Douglas fir dry, Ponderosa pine dry and Oregon white oak occur on lower elevation sites. For management purposes these lands are sometime better described as moist or dry which is derived from PVT. Most of these areas fall into the Dry or Very Dry categories, with some moist areas at the highest elevations.

In the planning area, elevation has the most influence on forest cover, absent the influence of disturbance. Shasta red fir is present in some of the highest elevation stands greater than 5000 feet. Shasta red fir is a variety of California red fir that is typically found at high elevations which are cool and moist. Pure Shasta fir stands can grow extremely densely. Other species often found in these areas are white fir, sugar pine, ponderosa pine and at lower densities, lodgepole pine and western white pine. In the areas between 5000 and 6000 feet, the primary forest types are white fir. White fir can exist as a dominant or codominant tree species within the stand depending on site specifics. Ponderosa pine, Douglas fir, sugar pine western white pine and incense cedar can be present in the stand as well with proportions shifting according to aspect and elevation. As white fir is the most shade tolerant of these species it is often found to be a major component of the understory. The history of fire suppression in the western United States has also contributed to the increased density of shade tolerant species like white fir and the subsequent increase in fire severity. At elevations below 5000 feet, forest stands tend to be dominated by Douglas-fir and Ponderosa pine, with components of sugar pine, incense cedar and Oregon white oak.

Historic Conditions

Historically, this area contained similar forest types, however in different concentrations and locations. Historic vegetation in this discussion comes from BLM Historic Vegetation data.

In the Northeast corner of the planning area, 1930s data show that there were fir/hemlock forests and mixed conifer area at higher density than much of the planning area. This is also one of the highest elevation areas. The data from 1900 showed several large, burned areas in that region

along with several areas with no timber that may have been burned previously. This area also contained quite a few large pine areas, which are not as evident in the modern forest cover types. There were also large areas of second growth pine and Douglas-fir in the area.

The north, central portion of the planning area seem to contain the densest forests in 1900 data. 1930s data shows that area to be primarily fir/ hemlock with areas of Douglas-fir old growth. In the northwestern portion of the planning area, the 1930s data show a conglomeration of Douglas fir, pine and fir/hemlock stands in various age classes as well as some recently cut over areas.

The 1930s data show that northwestern central portion of the planning area is dominated by pine in the areas that are forested, however there is also quite a bit of recently cut over area and non-forest.

The forested area in the southern central portion of the planning area is shown to be primarily pine with quite a few cutover areas on the eastern portion and some second growth Douglas-fir and fir/hemlock on the western side. The area close to the California border is largely non forested, but also contains one of the largest burn scars in the area. This area has deforested burns and cut over areas throughout it, as well as many smaller stands of second growth material. This suggests that disturbance in the form of fire and harvesting were common historically and are an important part of maintaining the ecological integrity of the planning area.

Forest Stand Structure

In addition to the dominant vegetation, the successional stage of these vegetation types provides a landscape-level view of restoration needs for the planning area. It also provides a metric with which to quantify habitat connectivity for a variety of different species across the landscape. According to Haugo et al. (2015), five successional classes (s-classes) can be used to describe forest structure in the planning area. These classes are early development, mid-development closed canopy, mid development open canopy, and late development closed canopy (**Figure 6-15**). These classifications are based on tree canopy cover and tree size classes. In terms of habitat connectivity, the distribution of stands in these structural stages can represent the ability of a species to travel between given points. The needs of individual species will determine the effectiveness of the current forest cover as a biological pathway to additional habitat, which can be very important for both distribution and survival. In addition, these structural stages can provide a guide to forest restoration needs. According to a defined reference condition, there is a natural range of variability (NRV) that characterizes the distribution of structural stages within an area when compared to historic structural stage distribution (**Figure 6-15**).

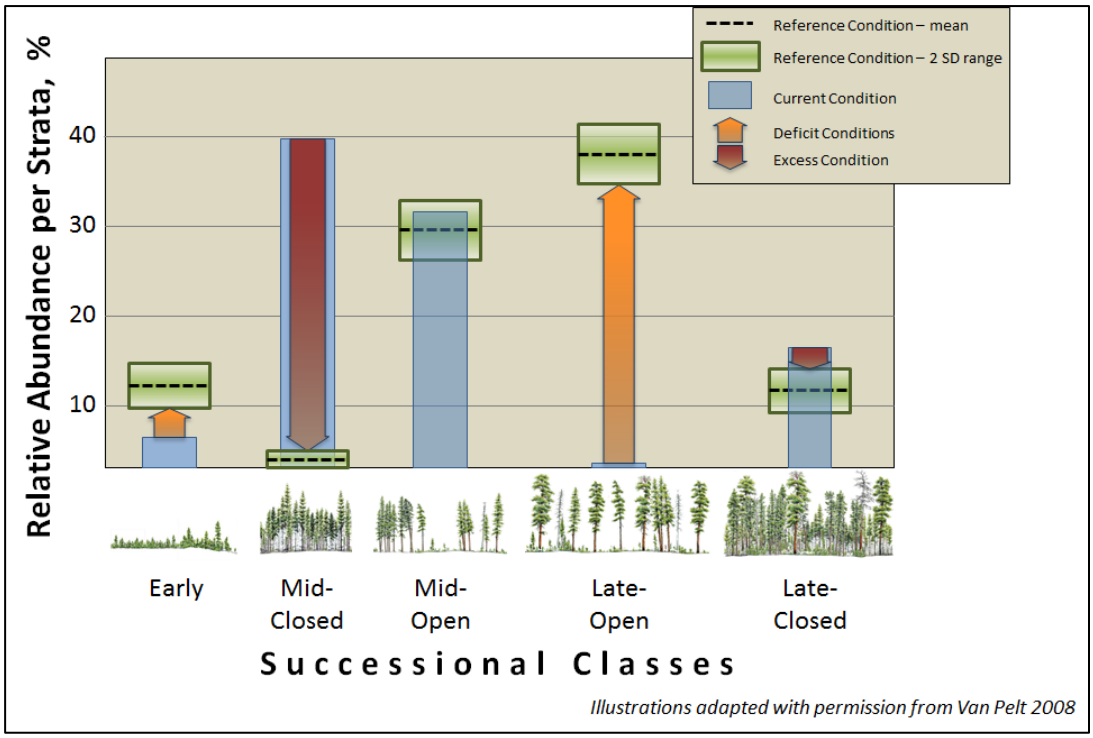

Figure 6-15. Reference condition successional class distribution in southwestern Oregon

Adapted from Van Pelt 2008

Figure 6-15 shows the historical reference condition distribution of successional stages to have a relative abundance of approximately 10-15 percent early, less than 10 percent mid-closed, 25-35 percent mid-open, 35-45 percent late-open, and 10-15 percent late-closed (USDI BLM 2016b, p. 1314). Observing this distribution and comparing it to current conditions is highly relevant because it provides insight into how the historical successional stage distribution had a relatively high level of resilience to disturbance factors as it compares to the current less resilient successional stage distribution on the landscape today.

Figure 6-15 also shows that current conditions are deficit in early and late open s-classes while there are a far too many mid closed stands and a slight excess of late closed stands. All these current s-class distributions are likely the effect of fire suppression, as a lack of fire allowed more closed canopy stands to develop than historically existed as well as preventing the development of more open stands that would result from regular fires.

Current s-class distributions in Haugo et al. (2015) are determined at large scale using GNN, rather than at the stand level, therefore can only really show us trends throughout the planning area rather than specific stands and their current restoration needs.

Within the planning area both late closed and late open primarily occur above 5000 feet. These stands are interspersed with mid open and mid closed stands, and very few early stands. The highest frequency of late closed stands occurs in the central section of the northern expansion area with less dense late closed stands in the northwestern and northeastern expansion areas. The

higher elevation, central portion of the original Monument area also has a higher frequency of late closed stands. The most late open stands occur in the northeastern area of the expansion area. Lower elevations are primarily mid open and mid closed with a large area of early successional stands in the southwest corner. Mid open and mid closed stands also dominate the western and eastern edges of the original Monument and the southwestern most part of the expansion area.

Forest Disturbance

Several disturbance agents have played a major role in creating the current vegetation landscape pattern in the planning area. Outside of human caused disturbances mentioned earlier, natural disturbance agents are important to consider when describing how vegetation condition came to be here. Fire is recognized within the Northwest Forest Plan as a key natural abiotic disturbance process throughout the Klamath Geologic Province (USDI BLM 1997). As a result of fire exclusion, the planning area has missed multiple cycles over the last 100 years, most noticeably in lower elevations dominated by Douglas-fir and Ponderosa pine. The absence of fire due to suppression efforts has changed the mixture or composition of tree species from one with more fire resilience to one more prone to stand replacement fire and drought caused mortality. More shade-tolerant conifers like white fir and Douglas-fir have increased due to the lack of fire to these systems, resulting in the loss of species with more fire and drought resilience such as ponderosa pine, Oregon white oak, and sugar pine. Fire exclusion has been associated with high survival rates in Douglas-fir recruited during the late 19th and early 20th centuries, resulting in the establishment of a closed-canopy forest (Messier et al. 2012). These forests are also overcrowded with smaller trees in both lower and higher elevations, leaving these stands more susceptible to insects and disease. Trees stressed from such agents have resulted in greater mortality rates among all tree ages, forest cover types, and elevations in the planning area. The effects of drought on these forests have also contributed to these stresses due to the local climatic patterns. These effects can be seen where dead and dying trees are observed, particularly south of Highway 66 in the lower elevations. Refer also to Section 6.3, Climate Change and Section 6.28, Wildland Fire and Fuels Management for more discussion on drought conditions.

Insects and pathogens are often predictable biotic disturbance agents of change currently present in the planning area and surrounding areas. These agents can decrease growth and cause mortality in individual trees. At a landscape level, they influence stand structure, composition, and function within forest ecosystems by creating canopy gaps, altering plant succession, creating decay columns and snags, which contribute woody material to the forest floor and streams. Insect and disease influences may be beneficial or detrimental to development and maintenance of late-successional or old-growth habitat, depending upon the mix of hosts, insects, and pathogens; current weather patterns; fire history; host species composition; host vigor; and past management activities. The forested areas within the planning area are either currently late-successional and old-growth habitat for the Northern Spotted Owl (McKelvey habitat types 1 and 2) or are capable becoming late-successional or old-growth habitats in the future (habitat types 3 and 5). The non-forested areas within the planning area are non-habitat for the Northern Spotted Owl (McKelvey habitat type 4) Refer to Section 6.20 for wildlife habitat descriptions. The following is a description of the diseases and insects (biotic disturbance agents) found within these habitats in the planning area (**Table 6-13**).

Table 6-13. Conifer forest disturbance agents found in the planning area

Disturbance Agent		Forest Type Affected				
Common Name	**Scientific Name**	**Red Fir**	**White Fir**	**Mixed Conifer**	**Douglas -Fir**	**P Pine[a]**
Laminated root rot	(*Phellinus weirii*)	x	x	x		
Annosus root rot	(*Heterobasidion annosum*)	x	x	x		
Shoestring root rot	(*Armellaria mellea*)	x	x	x		
Douglas-fir dwarf mistletoe	*(A. douglasii)*			x	x	
Western pine beetle	(*Dendroctonus brevicomis*)			x	x	x
Mountain pine beetle	(*Dendroctonus ponderosae*)			x	x	x
Flatheaded fir borer	(*Melanophila drummondi*)			x	x	x
Fir Engraver beetle	(*Scolytus ventalis)*	x	x	x		

[a] P Pine = ponderosa pine

6.22.2 Trends

Currently we can assume that without disturbance, forested and non-forested plant communities would continue to develop along their current successional pathways. Disturbance includes wildfires, prescribed fire, insect and disease damage, mortality, and harvesting and other vegetation treatments.

Assumptions made for disturbance agent effects are based on the climatic trends described in Section 6.3. Stand structural characteristics change in response to disturbance agents and determine to what extent a disturbance agent may alter stand development. For instance, lower densities in natural stands generally would result in lower levels of mortality due to beetles. In addition, species composition would determine the extent to which host specific root rots effect future stand development. Often beetle-pathogen interactions occur together and are affected by density and species composition. Fir engraver/root rot interactions are common in white fir plant communities and the more mesic higher elevation mixed conifer forest communities where white fir is found. Most of the assumptions pertain to mixed conifer because mixed conifer plant communities are the dominant conifer forest types found in the planning area, while white fir accounts for less. The following agents would affect forest structure and species composition assuming current climatic patterns continue. Generally, lower stand densities and larger tree size would accompany a shift away from small dense white fir toward larger ponderosa and sugar pine while maintaining other coniferous and hardwood species present. This “species shift” would be toward historic compositions.

Equally important, are non-forest plant communities, that are showing similar effects from both biotic and abiotic disturbances. The absence of fire has converted open savannahs and grasslands to hardwood woodlands and initiated the recruitment of conifers. As hardwoods and shrubs encroach into open savannahs and grasslands, over time, shade tolerant conifers begin proliferating through the understory converting the site to a mixed hardwood/conifer woodland condition. As a result, Oregon white oak is now a declining species largely due to fire

suppression and encroachment by Douglas-fir and white fir on most sites (USDI BLM 1997). Shade intolerant shrub and hardwood species that once thrived in open canopy conditions are now limited in growing space opportunities and are subjected only to the edges of closed canopy stands. The table below represent stand level trends associated with these agents and how they influence forest condition across the entire forested landscape of the planning area (**Table 6-14**.)

Each year, all forested federal, state, and private land in Oregon and Washington is aerially surveyed for insect, disease, and abiotic tree damage. This survey is flown cooperatively by Region 6 of the U.S. Forest Service, Forest Health Protection group; the Oregon Department of Forestry, Insect and Disease Section; and the Washington Department of Natural Resources. Data is collected during annual surveys that are generally flown from early July through September. The accuracy of polygon placement and polygon attributes is limited by several factors, including surveyor experience, weather, time of day, time of year and visibility. Areas that are not flown (due to fires, smoke, weather, restricted air space, etc.) are designated in the data with large “NF” (not flown) polygons. Historical reports of forest health conditions, which contain additional information on each year's aerial surveys, are available via the U.S. Forest Service (USDA FS 2023).

Table 6-14. Trends associated with forest disturbance agents in the planning area

Forest Disturbance Agents		Effects on Forest Condition
Common Name	**Scientific Name**	
Laminated Root Rot	*Phellinus weirii*	Ramifies through the stand, large impact due to lack of older structure and resistant species. The organism is on the site indefinitely. Forms gaps for intolerant species establishment, remains onsite indefinitely, affects only white fir and Doug fir, main disturbance agent in white fir plant communities.
Annosus Root Rot	*Heterobasidion annosum*	Heavy mortality of susceptible species (white fir) in previously managed stands, creates large openings that encourage a younger age class of trees to develop. Continues to kill true fir species and contributes to high surface fuel loading from the amount of tree mortality associated with the infections.
Shoestring Root Rot	*Armellaria mellea*	Causes mortality of most species particularly in dense stands where trees are stressed. Increased incidence due to logging damage and compaction occurs. Acts in concert with other root rots at lower levels. Fewer trees are stressed and are then less susceptible to an often-secondary pathogen.
Douglas-fir Dwarf Mistletoe	*A. douglasii*	Slows Douglas-fir growth and vigor of all age and size classes. Causes multiple branching patterns called witches brooms that wildlife uses as nesting structures. Heavy fuel loading concerns due to the branches that fall to the forest floor, resulting in more ladder fuel.
Western Pine Beetle	*Dendroctonus brevicomis*	Causes heavy mortality of large and small ponderosa pine in dense stagnate mixed conifer stands. Reduced levels of pine mortality due to decreased stand densities, less water stress, and more vigorous trees.
Mountain Pine Beetle	*Dendroctonus ponderosae*	Causes heavy mortality of large mature sugar and ponderosa pine in overly dense mixed conifer stands. Reduced levels of pine mortality due to decreased stand densities, less water stress, and more vigorous trees. Reduced risks to infestation.
Flatheaded fir borer	*Melanophila drummondi*	Causes heavy mortality of Douglas-fir of all age and size classes, generally in elevations less than 3500 ft. Heavy fuel loading concerns due to the number of dead trees that result from these beetle attacks.
Fir Engraver beetle	*Scolytus ventalis*	Heavy infestations in concert with root rots in dense stands. Risk is increased to larger forest areas. Forms gaps, found at lower levels due to fewer overly dense stands, natural density reduction occurs. Root rot/ insect interactions occur at lower levels.

Both forested and non-forested areas in the planning area are more susceptible to the disturbance agents mentioned earlier, particularly the abiotic effects from fire or the lack thereof. Trends associated with forested and non-forested areas as they pertain to fire and drought resiliency within the planning area are shown in **Figures 6-16 through 6-20**.

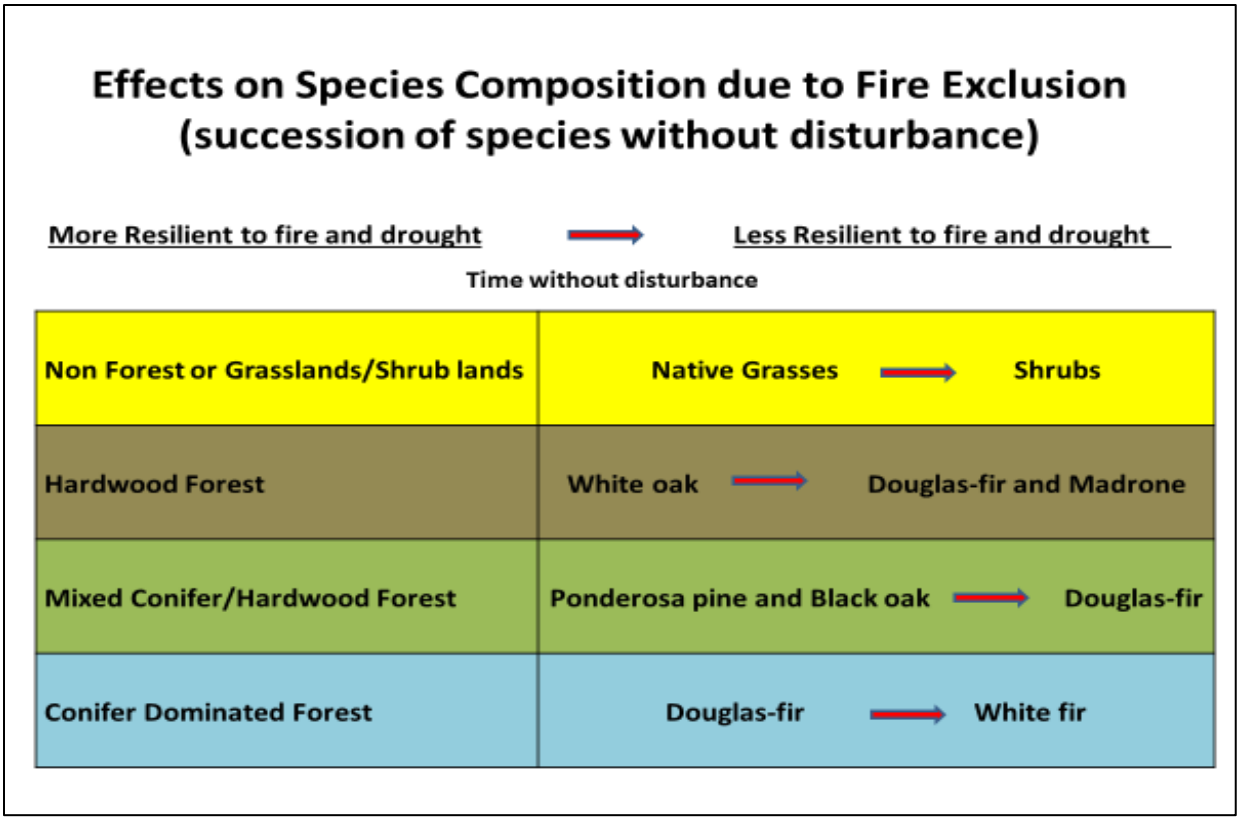

Figure 6-16. Effects on species composition due to fire exclusion (succession of species without disturbance)

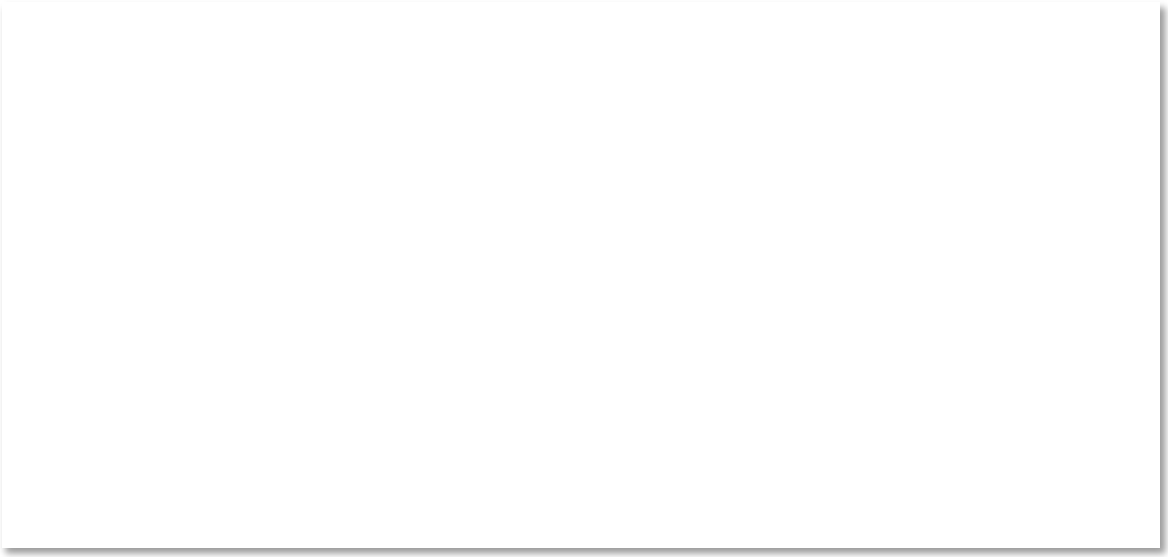

Figure 6-17. Non-forest or grasslands/shrublands

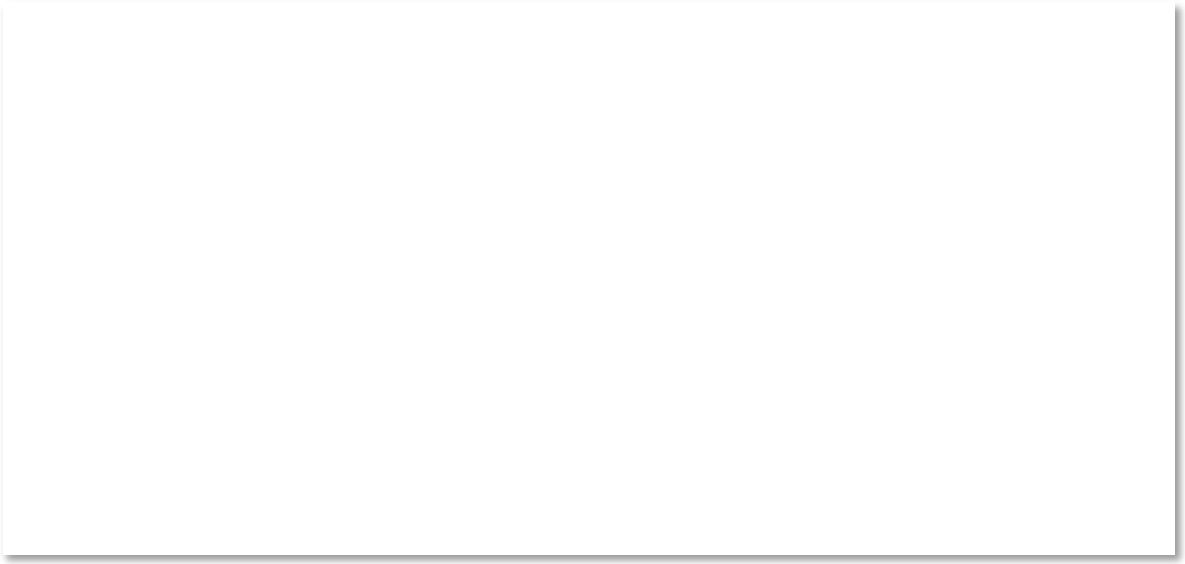

Figure 6-18. Hardwood forest/woodlands

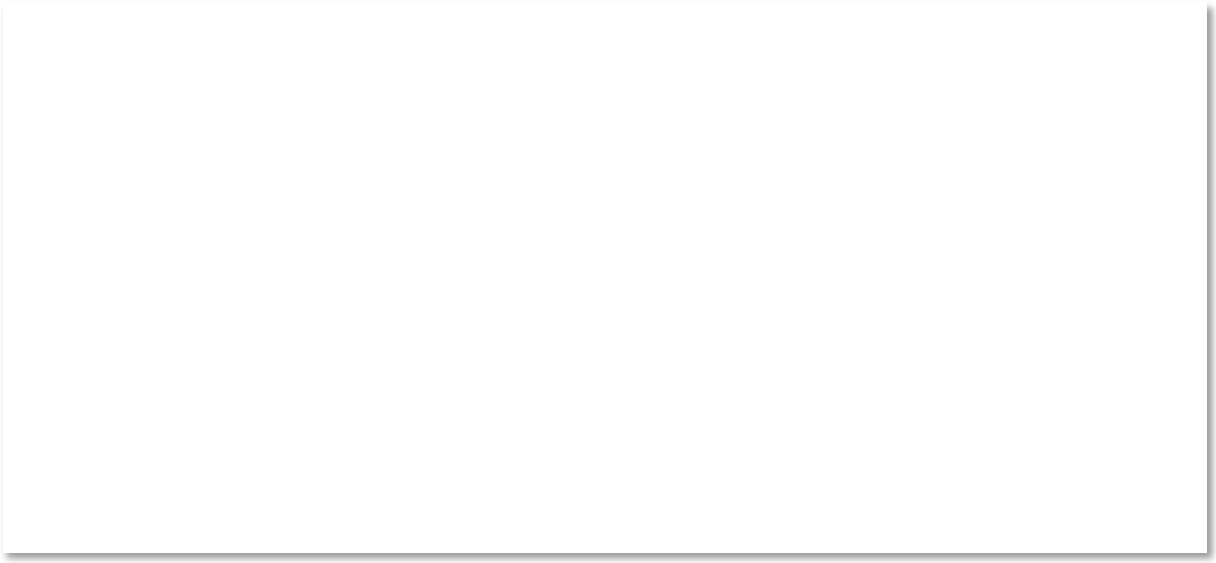

Figure 6-19. Mixed conifer/hardwood forest

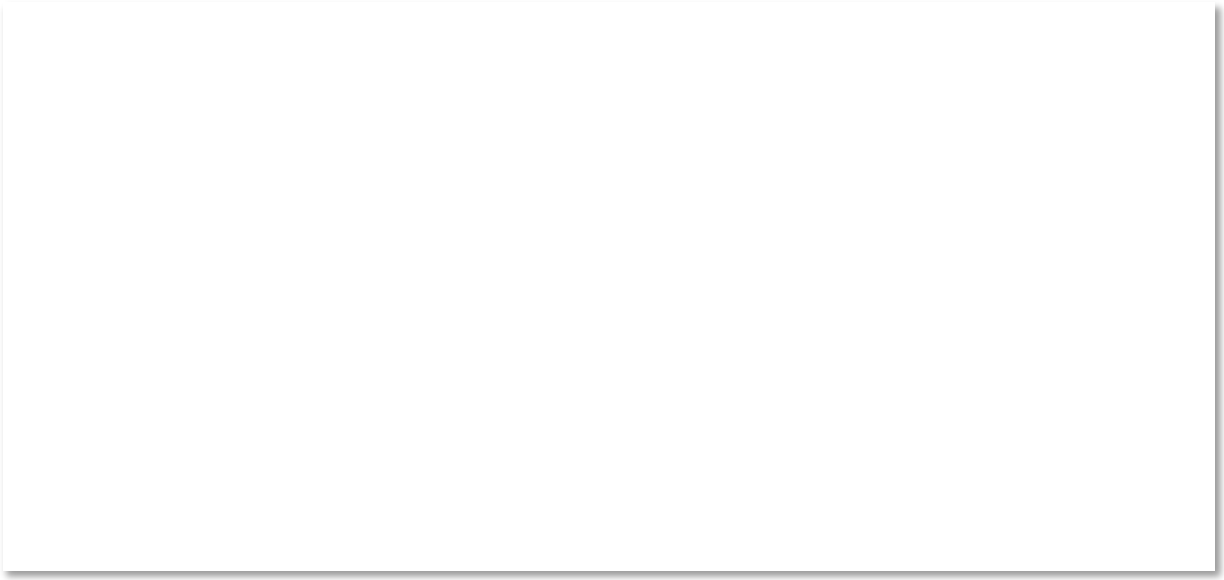

Figure 6-20. Conifer-dominated forest

6.22.3 Forecast

Insect and disease agents will continue to be a factor at the stand and landscape level. Disturbance agents would have various impacts to forest condition depending on successional stages and forest types described in **Table 6-13** and **Figure 6-16**. The planning area has a checkerboard pattern of ownership of intermixed private, state, Bureau of Reclamation and BLM-administered lands. However, to insects and disease these boundaries do not exist. As a result, these agents cross ownership boundaries and continue the cycle by spreading to neighboring forest stands. Trends described in **Figure 6-16** would continue to occur and tree species of shade tolerance would be replaced by species of shade intolerance. As mentioned previously, these agents affect forest structure, density, and species composition. Assuming climatic trends and the effects (i.e., drought) associated with such patterns continue, these forested lands would be less resilient to fire, because species with less fire adaptations would outcompete species with less drought tolerance and fire resilience. As a result, the above-mentioned effects can compromise habitat for late-successional and old-growth dependent species by increasing fuel loading, thereby increasing fire hazard. Refer to Section 6.28 Wildfire and Fuels Management.

Further, the threat of deforestation due to a combination of drought, wildfire and insect and disease damage are no longer theoretical. Studies in the dry forest of the Sierra Nevada showed that 50 percent of mature forest habitat and 85 percent of high density mature forests either transitioned to lower density or other non-forest vegetation types as a result of disturbance between 2011 and 2020 (Steel et al. 2022). A similar study showed that these conditions killed 89 percent of ponderosa pines in the three largest size classes in the area (Fettig et al. 2019).

Forests dominated by species that can no longer successfully reproduce or reestablish following disturbance due to changes in local climate (Bell et al. 2014, Davis et al. 2019, Taccoen et al. 2022, Hill 2022) is an emerging concern in the West. The popular press refers to these forests as

"zombie" forests. Recently identified in the Sierra Nevada forests of California (Hill 2022), evidence that such forests may be present within the Monument given the increasing drought-related mortality of species such as Douglas-fir (see Sections 6.22.1 and 6.28.2). Actions taken to reduce the risks of large-scale, high severity disturbances can allow the BLM to develop a "glide path" for these forests and reduce or minimize sudden, large-scale change to forest habitats and species that depend on them (Lin and Peterson 2013). Management actions can be tailored to guide the transition from one forest type to another, based on factors such as site productivity and risks associated with changing disturbance frequencies and severities, such as fire and insect outbreak.

Adaptability and active management would be the best tools for managing forests in an increasingly less resilient landscape (Agee and Lolley 2006; Knapp et. al. 2021; North et. al. 2022).

6.23 VEGETATION – WOODLANDS, SHRUBLANDS, GRASSLANDS, AND MEADOWS

6.23.1 Current Conditions

The vegetation within the planning area reflects its position at the confluence of three major ecoregions (**Figure 6-21**) as well as a high diversity in environmental conditions, terrain, soils, and local climate and a long history of human use. Section 6.22 discusses the forested plant communities. This section is focused on the other plant communities, broadly grouped into Woodlands, Shrublands, Grasslands, Riparian areas, and Rock Outcrops and Barrens (**Table 6-15**). Of necessity, these descriptions rely on unpublished reports that likely were not peer-reviewed (e.g., Frost 2017) and detailed descriptions of plant communities in smaller areas, such as the Scotch Creek and Oregon Gulch RNAs and the Sampson Creek Preserve (USDI BLM 2005, Frost 2017).

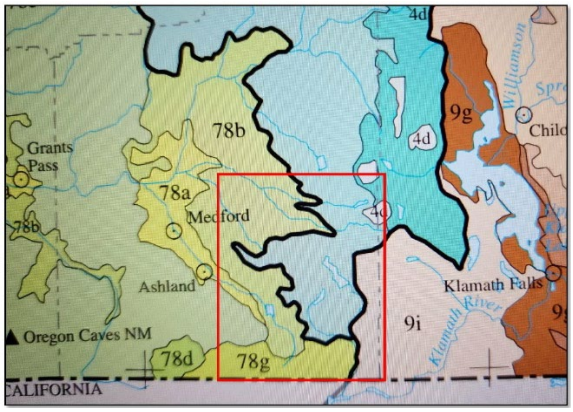

Figure 6-21. Terrestrial Level III ecoregions[a] and Level IV ecosections[b] in the vicinity of the Cascade-Siskiyou National Monument (generally located within the red rectangle)

[a] Ecoregions (heavy black lines): yellow/green (78) = Siskiyou Mountains; dark green (4) = Southern Cascades; light pink (9) = Eastern Cascades Slopes and Foothills.
[b] Ecosections (thin black lines): Rogue/Illinois Valleys (78a), Oak Savannah Foothills (78b), Serpentine Siskiyous (78d), Inland Siskiyous (78e), Klamath River Ridges (78g), Southern Cascades Subalpine (4d), Southern Cascades Montane Forest (4e), and Southern Cascades Slope (9i).

Adapted from Thorson et al. (2003)

Table 6-15. Non-conifer plant assemblages identified in the planning area

Non-conifer Plant Communities	Typical Species
2. WOODLANDS	
2.1 White Oak Woodland	*Quercus garryana*, *Symphocarpus albus*, *Mahonia sp., Elymus glaucose*
2.2 Black Oak Mixed Woodland	*Quercus kellogii*, *Pinus ponderosa*, *Pseudotsuga menziesii*, *Rosa sp*, *Ceanothus integerrimus, Festuca californica*
2.3 Juniper and Buckbrush Woodland/Shrubland	*Ceanothus cuneatus*, *Juniperus communis*, *Quercus garryana*, *Prunus subcordata, Poa bulbosa*
2.4 Quaking Aspen	*Populus tremuloides*
2.5 Juniper and Rabbitbrush Woodland/Shrubland	*Juniperus occidentalis*, *Chrysothamnus nauseosus*, *Ericameria suffructicosa*, *Lepidium densiflorum*, *Bromus tectorum*
3. SHRUBLANDS	
3.1 Mixed Mountain Mahogany Shrubland	*Cercocarpus montanus*, *Ceanothus velutinus*, *Prunus emarginata, Chrysothamnus nauseosus*, *Juniperus communis*, *Poa bulbosa*
3.2 Evergreen Sclerophyllous Chaparral	*Arbutus menziesii, Arctostaphylos viscida*, *Toxicodendron diversiloba*, *Quercus garryana*, *Cynosurus echinatus*
3.3 Brewers Oak Mixed (Rosaceous)	*Quercus garryana var brewerii*, *Amalanchier alnifolia* , *Prunus subcordata, Purshia tridentate, Symphoriocarpos albus*, *Elymus elymoides, Melica subulata*
3.4 Ridge-Top Curl Leaf Mountain Mahogany and Manzanita Shrubland	*Artemisia tridentate, Arctostaphylos patula, Cercocarpus ledifolious, Paxistima myrsinite*, *Holodiscus discolor, Sedum sp*
3.5 Poison Oak Thickets	Poison oak 'thickets' (*Toxicodendron diversilobum*)
4. GRASSLANDS AND MEADOWS	
4.1 Perennial/native Grassland	*Lemmon's needlegrass (Achnatherum lemmonii),* Roemer's fescue *(Festuca roemeri ssp. klamathensis), Western fescue (Festuca occidentalis), California oatgrass (Danthonia californica) and blue wild rye (Elymus glaucus)*
4.2 Annual/Non-native Grassland	*Centaurea solsticialis, Blepharipappus scaber*, *Madia sp*, *Apocynum androsaefolium , Lactuca serriola*, *Dipsacus fullonum*, *Taeniatherum caput-medusae*, *Poa bulbosa*
4.3 Wet Meadow	*Carex sp*, *Sidalcea malvaeflora*, *Ligusticum apiifolium, Trifolium sp*, *Dactylus glomerata*
4.4 Forb Dominated Dry Meadow	*Calocedrus decurrens , Polygonum*, *Phlox sp, Eriophyllum lanatum, Achnatherum lemmonii, Poa secunda*
5. BROADLEAF RIPARIAN WOODLANDS AND SHRUBLANDS	
6. ROCK OUTCROPS AND BARRENS	

Based on Frost (2017); Kendig, Southworth, and Hosten (2009); Johnson and O'Neil (2001)

Woodlands

Oak-dominated woodlands are found throughout the southern portion of the planning area typically at lower elevations and is the primary woodland type. Oak density ranges from savannah to dense forest. Oregon white oak (*Quercus garryana*) is the dominant oak species on shallower soils and drier sites. California black oak (*Q. kellogii*) is dominant on deeper soils and moister sites (BLM 2005, Franklin and Dyrness 1988, Frost 2017, Riegel et al. 1992). The understory ranges from shrubby to grassy as this community intergrades with chaparral and grasslands (BLM 2005, Frost 2017). Oak white oak woodlands also intergrades with conifer forest at higher elevations. Scattered western juniper (*Juniperus occidentalis*) is often present on the more open Oregon white oak sites (USDI BLM 2005).

Minor woodland types include western juniper and aspen. Juniper woodlands also contain widely scattered Oregon white oak and ponderosa pine (*Pinus ponderosa*) with a shrubby understory and considerable bare rock (USDI BLM 2005). Aspen patches occur intermixed with several forest types on moist sites often as a ring around a meadow and around seeps and springs. In the planning area it has an understory like the vegetation of adjoining wet and dry meadows.

Shrublands

Chaparral is the most common type of shrubland present. Two main forms of chaparral appear; an evergreen form and a deciduous form. The sclerophyllus evergreen chaparral consists of a tall, dense canopy of evergreen shrubs with hard, waxy leaves. This type grows on harsh, dry sites with thin, rocky soils and can be difficult to walk through (Frost 2017). Oak-chaparral communities, also known as Rosaceous chaparral, consist of Oregon white oak over a dense shrub layer composed of deciduous shrub species, mostly members of the Rose family (USDI BLM 2005, Brock 2002, Frost 2017). The oak is shrubby rather than tree-form (USDI BLM 2005). Which shrub species is more common depends on elevation and soils (USDI BLM 2005, Frost 2017). For example, mountain-mahogany is more common on rockier soils while snowberry (*Symphoricarpos* spp.) is more common on deeper, moister soils.

Minor shrubland types include ridgetop curlleaf mountain mahogany-manzanita (*Cercocarpus ledifolius-Arctostaphlos* ssp.) shrubland and poison oak (*Toxicodendron diversilobum*) thickets. Both types consist of small patches. The mountain mahogany-manzanita shrubland grows on rocky outcrops and within forested areas. The understory is sparse and dominated by bunchgrasses. Poison oak thickets appear on lower elevation dry sites and is associated with oak woodlands and grasslands with the densest patches associated with annual grasslands (Frost 2017).

Grasslands

The planning area supports four primary grassland communities: 1) annual/non-native grasslands; 2) perennial/ native grasslands; 3) wet meadows; and 4) forb-dominated dry meadows. Nonnative grasses and forbs dominated the annual grasslands, which are more abundant at lower elevations on sites historically grazed heavily by cattle and sheep. Scattered shrubs and patches of native bunchgrasses are present along with scattered Oregon white oak on

deeper soils (USDI BLM 2005, Brock 2002, Frost 2017). Annual grassland sites are also found on shallow, rocky soils (BLM 2005).

Perennial grasslands, wet meadows, and forb-dominated dry meadows appear as small patches scattered across the planning area. Native bunchgrasses and forbs dominate on the perennial grasslands with scattered Oregon white oak are more common than pure grassland (Frost 2017). Perennial grasslands have persisted primarily on sites with low or no historical grazing by cattle and sheep (Frost 2017). Wet meadows typically occur around seeps and springs and adjacent to marshes. They are seasonally moist to wet, and many sites dry by late summer. Wet meadows are typically open and dominated by a diverse mix of grasses, sedges, rushes, and forbs. Forb-dominated dry meadows contain more forbs and bare ground than grasses. These grow on shallow, rocky, well-drained soils on the upper hills and ridges (Frost 2017).

Riparian Areas

Riparian woodlands are plant communities dominated by trees and woody shrubs that depend on the existence of surface or subsurface water. Areas immediately adjacent to streams and creeks support vegetation that strongly contrasts with surrounding uplands. Though riparian areas occupy a relatively small proportion of the planning area they are generally the most biologically productive sites (Gregory et al. 1991; Naiman et al. 1993).

In the planning area, riparian habitats vary from alluvial broadleaf woodlands associated with year-round water flows to narrow corridors (stringers) that range from intermittent (e.g., seasonal) to ephemeral (e.g., primarily following precipitation events). Subsurface water likely persists into the dry season along many intermittent and ephemeral drainages and exerts a less dramatic, more localized influence on the vegetation. Perennial springs and small ponds that dot the planning area also support small-scale patches of riparian vegetation (Frost 2017).

Most woodlands located along planning area streams support an intermittent to continuous canopy of deciduous trees and tall shrubs. Along steep, canyon-like stream reaches, the riparian vegetation is narrow and less developed, with fewer canopy trees. In floodplains, terraces, and more gentle terrain, the overstory tends to be denser and taller. Characteristic tree species include white alder (*Alnus rhombifolia*), black cottonwood (*Populus balsamifera* var. *trichocarpa*), bigleaf maple (*Acer macrophyllum*), willows (*Salix sp.*), and Oregon ash (*Fraxinus latifolia*) (USDI BLM 2005). Oaks and conifers from adjacent uplands often appear as scattered individuals. Shrubs replace trees along smaller streams and tend to be patchy with open areas (USDI BLM 2005).

Rock Outcrops and Barrens

Rock outcrops and barrens are areas of exposed surface rock, cobbles and thin/gravelly soils that support sparse vegetative cover. Within the planning area rock outcrops are common landscape features, often spatially isolated from each other and appearing as small inclusions of exposed bedrock (less than 4 acres, usually smaller) or cobbly soil within a matrix of contrasting vegetation. They can be found on all topographic settings and elevations, but most commonly occur on steep hillslopes or ridgelines.

Outcrops and barrens have little to no topsoil to hold moisture. Plants that live in these settings are strongly drought-adapted, able to find sufficient moisture and nutrients by sending roots into rock crevices or other areas where soil accumulation allows growth. The most exposed rock surfaces experience extreme daily fluctuations in temperature and are primarily inhabited by lichens and mosses. Within larger rocky features, a mosaic of microhabitats, such as terraced ledges, overhangs, and crevices, support small trees, shrubs, and forbs.

6.23.2 Trends

A lack of repeated vegetation descriptions makes assessing recent trends difficult except with respect to certain nonnative invasive plants. Some information is available on changes that have occurred since the late 1800s and early 1900s (e.g., Hosten et al. 2007). However, these descriptions are difficult to relate to specific plant communities. Therefore, this discussion is not specific to particular plant communities. Most changes have occurred on the more productive sites within the planning area (Hosten et al. 2007).

Many woody plant communities have become denser likely due to the lack of disturbance, particularly fire, or the introduction of new disturbances such as historical grazing levels and harvest practices (Hosten et al. 2007, Frost 2017). Woody plants have invaded grasslands formerly maintained by the burning practices of Native Americans prior to Euro-American settlement (Hosten et al. 2007). Seedling and sapling conifers are increasingly common in California black oak understories (Cocking et al. 2015, Frost 2017) and will eventually overtop and kill the black oak. Western juniper and rabbitbrush have spread onto low slopes and valleys on the east side of the planning area, especially areas formerly dominated by mountain big sagebrush (*Artemisia tridentata* ssp *vaseyana*).

Post-settlement disturbances and land uses created both the Annual grassland and Poison oak thicket plant communities. Non-native annual grasses and invasive forbs have displaced native grasses and forbs in areas historically heavily grazed by cattle and sheep (USDI BLM 2005, Hosten et al. 2007, Frost 2017, ODFW 2016). More recently arrived invasive species include ventenata (*Ventenata* dubia) and yellow starthistle (*Centaurea solstitialis*). Although evidence is sparse, the lack of regular burning and historical levels of grazing appears to have increased the abundance of poison oak and allowed the formation of thickets (Frost 2017).

Continued grazing by cattle and feral horses on wet meadows available to them have led to soil compaction, erosion, loss of native species and invasion by non-native species particularly in the drier portions of these meadows. Wet meadows now excluded from grazing show no signs of recovery to pre-grazing conditions.

Irrigation structures, dams, and diversions have altered the frequency and intensity of bottomland flooding. Increases in nutrients and pollutants are other common anthropogenic impacts, the former with particularly acute effects in bogs. Livestock grazing also has a significant impact on the ecological integrity of this community due to consumption of vegetation, streambank trampling, and water quality degradation.

6.23.3 Forecasts

The above trends are expected to continue in the absence of restoration actions or altered management regimes. Many studies in sagebrush steppe and southern California chaparral demonstrated that once annual grasses become dominant, xeric semi-arid sites cannot self-correct, resulting in a new steady state (e.g., DiTomaso et al. 2017, Mahood et al. 2023, Pratt 2022, Pyke et al. 2015).

Climate change is expected to further exacerbate these trends through continued alternations in disturbance regimes. In general, conditions within the planning area are expected to become drier as seasonal and annual temperatures increase, but precipitation does not change or does not change enough to overcome the temperature increases. Decreasing snowpacks, increasing risks of insect outbreaks and tree diseases, and increasing likelihood of larger, more severe wildfires are expected to raise the location of lower timberline and allow chaparral to expand upward. It is unclear if chaparral will also decrease in lower elevations.

Sites sensitive to disturbance, such as the drier sites, are more vulnerable than moister sites, placing forb-dominated dry meadows, perennial grassland remnants, and drier riparian areas at greater risk of alterations in plant community structure or replacement by annual grassland. Whether Oregon white oak will continue to provide a buffer for perennial bunchgrasses is unknown. The changes in disturbance regimes and increasing atmospheric carbon dioxide concentrations are expected to favor the continued expansion of non-native forbs and annual grasses, particularly if permitted grazing and populations of feral horses are not altered to reflect reduced grass production.

Certain management actions could mitigate or slow the rate of change among the plant communities and shifts in species composition in the short-term. The efficacy of such actions over the long-term is uncertain.

Conifer removal in black oak woodland would prevent overtopping and loss of the oak (Devine et al. 2007). In places where conifer encroachment is minimal, small-scale, low intensity prescribed fires could improve regeneration of California black oak from seed and help maintain abundance of these trees into the future (Cocking et al. 2012b). Reintroduction of beaver or construction of beaver dam analogs could raise water tables and soil moisture, helping to preserve aspen stands and wet meadows. Removal of conifers within aspen stands could maintain more upland aspen stands and promote aspen regeneration. Because aspen roots can extend beyond the current stand, removal of conifers several feet beyond the existing stand and protection from grazing by cattle, deer, and elk can increase the size of existing patches through root sprouting. Removal of post-settlement juniper trees can increase available soil moisture and allow the expansion of native perennial bunchgrasses and forbs, although additional actions may be needed to control invasive non-native grasses and forbs.

Vegetation dynamics of the chaparral types present in the planning area have not been studied so forecast changes and potential management actions to maintain chaparral remains uncertain. Since Ridgetop curlleaf mountain mahogany-manzanita is near the northern limits of its range, it may continue to migrate north or up in elevation, provided a pathway exists, or disappear

following a wildfire if conditions become too dry for it to recover. In the absence of control measures and presence of continued grazing, poison oak thickets would continue to expand.

6.24 VISUAL RESOURCES

6.24.1 Current Conditions

Although the proclamations (7318 and 9564) establishing and expanding the CSNM do not explicitly identify scenery as an object and value for protection, many of the objects and values identified contain scenic features that contribute to the visual sensitivity of the area. Presidential Proclamation 7318, which originally established the CSNM, mentions the steep canyons, towering fir forests, and Pilot Rock. Presidential Proclamation 9564, which expanded the CSNM, mentions historic routes used by Native Americans and the Applegate Trail, as well as Jenny Creek Falls. These scenic features along with others will be used in the visual resource inventory to determine visual values in the RMP process.

The FLPMA includes federal mandates for scenic and aesthetic resources that require the BLM to manage lands in a manner that will preserve scenic values. Direction for implementation of these federal mandates is provided in BLM Manual MS-8400 Visual Resource Management, BLM Handbook H-8410-1 Visual Resource Inventory, and BLM Handbook H-1601-1 Land Use Planning.

The BLM VRM system consists of three phases: the visual resource inventory (VRI); the establishment of management classes and corresponding objectives through the land use planning process; and the analysis of site-specific management action implementation to ensure compliance with the objectives established in the land use plan. The intent is to minimize the visual impacts of all ground-disturbing activities, regardless of the management class in which they occur.

VRI classes are determined by documenting the following:

- Scenic Quality—A measure of visual appeal whose scenic quality classes are:
    - Class A: Distinctive, high degree of visual variety
    - Class B: Common or typical, moderate degree of visual variety
    - Class C: Indistinctive, low degree of visual variety
- Viewer Sensitivity—A measure of the public's tolerance for change in the visual environment:
    - Maintenance of Visual Quality has High Value
    - Maintenance of Visual Quality has Moderate Value
    - Maintenance of Visual Quality has Low Value
- Distance Zones—From where the public views the landscape:
    - Foreground/middle ground zone: From viewing platform to 3-5 miles out
    - Background zone: From the edge of the foreground/middle ground zone to 15 miles out

  - Seldom-seen zone: Areas not visible in the foreground/middle ground or background zones and areas beyond the background zone.

VRM classes are established during the land use planning process by balancing inventoried visual values with other resource values and land use allocations. These VRM classes establish defined objectives for future management of BLM-administered lands:

- Class I Objective is to preserve the landscape's existing character. The level of change to the characteristic landscape should be very low and must not attract attention. (Wilderness, WSAs, wild sections of Wild and Scenic Rivers (WSRs), and other congressionally and administratively designated areas where decisions have been made to preserve a natural landscape are assigned VRM Class I per policy clarification in IM No. 2000-096.)
- Class II Objective is to retain the landscape's existing character. The level of change to the characteristic landscape should be low.
- Class III Objective is to partially retain the landscape's existing character. The level of change to the characteristic landscape should be moderate.
- Class IV Objective is to provide for management activities that require a major modification of the landscape's existing character. The level of change to the characteristic landscape can be high.

To meet the long-term CNSM objective of preservation of the natural landscape, the 2008 CSNM RMP established a VRM Class I Objective for the 5,640-acre Soda Mountain Wilderness Study Area (WSA) and a VRM Class II Objective for CSNM lands (47,307 acres) outside of the WSA. In 2009 Public Law 111-11 designated 24,707 acres of the CSNM as the Soda Mountain Wilderness. As a result of this designation the Soda Mountain Wilderness was assigned a VRM Class I Objective and the remaining approximately 28,240 acres of the original CSNM remain VRM Class II Objective.

BLM-administered lands in the expanded CSNM were assigned VRM classes under the 2016 Southwestern Oregon RMP. The Pacific Crest 1 and 2 SRMA (6,070 acres) and the Pacific Crest Trail Corridor SRMA (659 acres) were assigned a VRM Class II Objective. The Grizzly Peak SRMA (2,912 acres) were assigned a VRM Class III Objective and the remaining BLM-administered lands in the expanded CSNM (approximately 37,000 acres) were assigned a VRM Class IV Objective.

The Redding Field Office completed a VRI for the Northwest California RMP in June 2015 under a contract by Otak, Inc., which included BLM managed lands in California that are now included in the CSNM. The inventory methodology and approach followed BLM Handbook H-8410-1 and the CSNM lands (Cascade Unit) were rated as a VRI Class II.

Since there have been several management designations since the original CSNM designation (Soda Mountain Wilderness, Jenny Creek and Spring Creek Scenic Rivers, and expansion of the CSNM) that require changes to existing VRM classes, a VRI will be conducted during this planning process that will be used to develop VRM classes and their corresponding objectives for the entire CSNM. If there are any site-specific ground disturbing management actions

proposed in this plan, a VRM analysis would be conducted to ensure visual resources are not impacted.

6.24.2 Trends

With nearly one third of the planning area being private lands, development imprints including roads, transmission lines, private inholdings, vegetation management, and recreation developments can be seen in many locations. However, in the southern portion of the original CSNM relatively large tracts of BLM-administered land in the Soda Mountain Wilderness exhibit intact natural visual characteristics. Since the CSNM's designation in 2000, there have been very limited visual impacts on BLM-administered lands and maintaining visual quality has resulted overall in a stable trend.

VRM class objectives do not apply to the private lands in the planning area and any development on private lands that may impact visual quality are outside the BLM's influence and control. However, VRM on BLM-administered lands is designed to meet or exceed VRM class objectives. This approach has been and would continue to be effective in maintaining the scenic quality on BLM-administered lands in the planning area.

6.24.3 Forecasts

With the upcoming VRI being completed for the BLM-administered lands in the planning area, visual values may change primarily due to increasing viewer sensitivity to landscape change. There are several factors that affect viewer sensitivity in the planning area, including increasing recreational use, more overall public interest in the CSNM, and the change in management objectives once the area was designated a National Monument. Recreational users tend to be sensitive to changes to visual quality and now the primary management goals for the lands in the planning area is more preservation oriented with a more natural landscape setting. VRM class designations and their corresponding objectives are expected to change in some locations with this planning process. Additional management designations since the original CSNM designation, such as a wilderness designation, WSR designations, and the expansion of the CSNM, require a more natural landscape and would be used to develop future VRM classes.

Causal factors that could also impact scenic quality in the planning area that are outside the BLM's influence or control are climate change and the development of adjacent private lands. The development of private lands within the planning area for residential uses is likely to continue and increase, resulting in changes to the landscape character in those interface zones (see Section 6.9.3). The intensifying drought and severe wildfires associated with climate change are forecasted to change vegetation (e.g., dead and/or burnt stands of trees, reduced shrub and grass cover, increasing insect and disease pressure, and reduced water availability), especially in riparian and true fir forests. They are also forecasted to reduce the presence of surface water, potentially to the degree that inventoried scenic quality values would shift.

6.25 WILD AND SCENIC RIVERS

Wild and Scenic Rivers (WSR) are designated by Congress under the authority of the Wild and Scenic Rivers Act of 1968 to preserve their free-flowing condition, water quality, and

outstandingly remarkable values (ORVs). ORVs are identified on a segment-specific basis and may include scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar values. BLM Manual 6400 provides direction on identification, evaluation, planning, and management of WSRs.

Section 5(d)(1) of the Wild and Scenic Rivers Act (WSRA) directs federal agencies to consider potential WSRs through their land use planning process. To accomplish this, the BLM reviews all streams within its jurisdiction and uses a three-step evaluation system for possible inclusion in the National System: (1) determination of eligibility, (2) tentative classification, and (3) determination of suitability. The three types of tentative classification are wild, scenic, and recreational. The tentative classification is based on the condition of the river and the adjacent lands along an eligible river at the time of the study and is used as a guide for future management activities.

6.25.1 Current Conditions

In 1990 the BLM Western Oregon Districts (Coos Bay, Eugene, Medford, Roseburg, and Salem) and the Klamath Falls Field Office of the Lakeview District completed the eligibility phase of a WSR evaluation as part of the Western Oregon RMP revision process (USDI BLM 1995a). The result of this planning effort was the identification of 51 eligible river segments and thirteen suitable river segments, which were recommended for potential inclusion in the National System. Jenny Creek, which is in the original CSNM boundary, was found to be eligible with three ORVs (resident fish, wildlife, and historic), but was found not suitable for inclusion in the national system.

The BLM conducted a subsequent WSR eligibility study on the Medford District BLM for the 1995 RMP and identified 16 stream segments as eligible, none of which were in the CSNM boundary. Thirty stream segments were identified as ineligible, including several streams in the CSNM (Camp Creek, Dead Indian Creek, Dutch Oven Creek, and a segment of Lost Creek).

In 2013, during the planning process to revise the Western Oregon RMPs, the BLM re-analyzed 13 of the 30 stream segments that were identified as ineligible in the Medford District RMP (USDI BLM 1995a) planning process. This included three streams in the CSNM (Camp Creek, Dead Indian Creek, and Dutch Oven Creek) but did not include the segment of Lost Creek. Dead Indian Creek was found to have no ORVs and was found ineligible, while Camp Creek and Dutch Oven Creek were found to have several ORVs, including resident fish, potential historic and cultural resources as well as scenic waterfalls. The Lost Creek analysis suggested combining the segment with the downstream segment and reanalyzing for suitability.

During the planning process to revise the western Oregon RMPs, the BLM also re-assessed the suitability of the 51 river segments that were identified as eligible in the 1995 Medford District RMP process. Of the 51 stream segments, the BLM determined that 6 segments were suitable for Wild and Scenic River designation, while 45 segments were found not suitable. Streams in the original CSNM boundary were excluded from this study.

The John D. Dingell, Jr. Conservation, Management, and Recreation Act of 2019 designated two stream segments in the CSNM: 17.6 miles of Jenny Creek and 1.1 miles of Spring Creek were

designated as scenic. In addition to the three ORVs identified by the BLM during its eligibility assessment (resident fish, wildlife, and historic), Senator Ron Wyden entered into the Congressional Record a description of Jenny Creek having recreational, scenic, and ecological/biological diversity ORVs. Senator Wyden entered into the Congressional Record a description of Spring Creek having scenery, wildlife, and fish ORVs. The BLM will make final ORV determinations when it completes the comprehensive river management plans for Jenny and Spring creeks.

In the California portion of the expanded CSNM the BLM completed a WSR eligibility study for the 1992 Redding Resource Area RMP and found the California portion of Jenny Creek eligible with a tentative classification as scenic.

A follow up WSR eligibility study completed in 2018 for the Redding and Arcata IRMP identified a 1.5-mile section of Jenny Creek from the California border downstream as eligible with a tentative classification as wild with a scenic ORV.

For this planning effort, the BLM will first conduct a baseline WSR eligibility study for BLM managed streams in the CSNM. Stream segments identified as eligible will be assigned a tentative classification and the free-flowing condition, water quality, and identified ORVs will be protected or enhanced until suitability can be determined through this RMP process.

The designated segments and corridors for Jenny Creek and Spring Creek can be found on **Map 6-2.** Cascade-Siskiyou National Monument – Existing Designations.

6.25.2 Trends

Increased visitation and damage from overuse and improper use within the river segments and corridors can affect all potential ORVs. Climate change impacts can affect values across the river, including viewsheds, fish and wildlife habitat, vegetation, and recreation opportunities.

6.25.3 Forecasts

The free-flowing condition, water quality, and identified ORVs of stream segments found eligible in this planning effort would be protected or enhanced until suitability can be determined during this RMP process. Any stream segments found suitable for inclusion in the National system are likely to remain the same, pending congressional action.

6.26 WILDERNESS

In 1964, the Wilderness Act established the National Wilderness Preservation System to be managed by the U.S. Forest Service, National Park Service, and U.S. Fish and Wildlife Service. In 1976, FLPMA made the BLM the fourth agency with wilderness management authority under the Wilderness Act. The Wilderness Act directs agencies to preserve the wilderness character of all areas managed under the Act.

6.26.1 Current Conditions

There is one designated wilderness area within the planning area. In 2009, Congress designated the Soda Mountain Wilderness (SMW), which comprises 24,707 acres of the planning area. The Final SMW Stewardship Plan was completed in April 2012 and is an implementation-level plan that provides a set of decisions outlining management of the SMW. The plan 1) identifies the conditions and opportunities which will be managed within the wilderness; 2) creates specific guidance for managing the resources and activities existing in the wilderness; and 3) preserves the area's wilderness characteristics cumulatively identified as untrammeled quality, outstanding opportunities for solitude or a primitive form of recreation, undeveloped character, and naturalness and primeval character.

6.26.2 Trends

The Soda Mountain Wilderness has been managed in accordance with BLM Manual 6330 and the 2012 Soda Mountain Wilderness Stewardship Plan. Per guidance in BLM Manual 6330 Wilderness Character Monitoring for the SMW was completed in 2014 and was updated in 2022. Wilderness Character Monitoring uses a series of indicators posed as questions that are used to assess change in each quality of wilderness character (untrammeled, natural, undeveloped, solitude or primitive and unconfined recreation, and unique, supplemental, or other features.).

Since 2014, the greatest impact to the SMW's wilderness character has been suppression of the 2017 Klamathon fire and the 2020 Agate Flat fire. The suppression of the fires, while necessary to address threats to human health and safety, negatively affected the area's untrammeled quality. The naturalness and undeveloped qualities were affected by bulldozers and retardant drops. Since the fire, the BLM has rehabilitated bulldozer lines. While seeding has a negative impact on the untrammeled quality of wilderness character, the BLM deemed the use of native seeding to be necessary in order to reduce ongoing effects on the area's naturalness.

Invasive plants and cattle and wild horse trespass also affect the natural quality of the SMW. These are being addressed with invasive plant removal and improvements in fencing. While invasive plant removal has a negative impact on the untrammeled quality of wilderness character, the BLM has deemed it necessary in order to protect the area's naturalness from the effects of invasive plants. Visitation to the SMW has increased in recent years, particularly along the PCT and the Pilot Rock trail, but there are still outstanding opportunities for solitude and primitive forms of recreation the SMW. Other than these changes, the wilderness character monitoring indicates there is a stable trend or even a trend toward a more natural condition as the imprint of human activities are receding from areas inside the SMW.

6.26.3 Forecasts

The Soda Mountain Wilderness would continue to be managed to preserve the wilderness character in accordance with BLM Manual 6330 and the Soda Mountain Wilderness Stewardship Plan.

6.27 WILD HORSES

6.27.1 Current Conditions

There is one wild horse herd area in CSNM, the Pokegama Herd Management Area (HMA). This HMA encompasses 85,855 acres in Oregon and California and includes private, state, and federal lands. Approximately 3,926 acres (2021 BLM acres) are within the planning area, and about 23 percent of the HMA is BLM-administered lands managed by the Klamath Falls Field Office of the Lakeview BLM District. Management of the Pokegama HMA has a set Appropriate Management Level of 30 to 50 horses for optimal carrying capacity of the land where the herd mostly uses private land. Most of the California portion of the HMA (13,016 acres) is located on private and state land: only five percent is located on BLM-administered lands (USDI BLM 2016c, vol. 2, p. 842). **Map 6-2**. Cascade-Siskiyou National Monument – Existing Designations shows the boundary and ownership of the HMA.

The Pokegama herd is currently estimated at 230 horses which is considerably above management objective levels. The BLM attempted gathers on private land 30 miles southwest of Klamath Falls in 2020 and again in 2022 with little to no success. BLM used temporary bait traps stocked with hay and water but did not use helicopters.

6.27.2 Trends

6.27.3 Forecasts

Future gathers are planned in 2023 to reduce the herd size working towards meeting population objectives and natural ecological balance. Litigation on horse gatherings has been a barrier for effective management of this HMA.

6.28 WILDLAND FIRE AND FUELS MANAGEMENT

6.28.1 Current Conditions

The current condition of vegetation, fuels, and wildfire for lands within the planning area generally reflects a landscape that has not experienced the frequent to moderately frequent low-mixed severity that shaped it in previous times.

Vegetation Condition, Fire Regime Groups, and Departure

Fire regimes describe the spatial, temporal, and characteristic severity of fire disturbance (frequency, size, and severity) and are generalizations based on fire histories and historic disturbance regimes. Most fire regime classifications describe the presumed conditions under which vegetation communities have evolved and been maintained for a given ecosystem or landscape (Sommers et al. 2011). Different fire regime classifications exist, some of which focus on specific and specialized plant communities (e.g., grasslands, chaparral, and peat systems), while others include seasonality of burn and other nuanced factors (Sommers et al. 2011). This discussion focuses on the five fire regime groups, recognized by LANDFIRE (Barrett et al. 2010) and the National Wildfire Coordination Group (NWCG PMS 205), which provide a discrete categorization based on fire frequency and expected severity (**Table 6-16**).

The planning area has acreage in each of the fire regime groups (**Table 6-16**), however the majority (94 percent) of the Planning Area is categorized as Fire Regime Group 1. Fire Regime Group 1 is characterized by relatively frequent fire return intervals and primarily low-severity fire, however, does include portions of mixed severity fire. Historically, the majority (93%) of the Planning Area would have experienced stand replacement fire less than 20% of the time and the majority (92%) of fires would have been frequent low-mixed severity fire surface fires with occasional patches of torching trees.

Table 6-16. Fire regime groups, frequency, and severity

Fire Regime Group	Frequency	Severity	Acres	Percent of Planning Area
I	0–35 years	low	159,676	94
II	0–35 years	stand replacement	1,803	1
III	35–200 years	mixed	4,053	2
IV	35–200 years	stand replacement	3,083	2
V	200+ years	stand replacement	439	0.3

Based on NWCG PMS 205, Barrett et al. (2010), and LANDFIRE (2020)

In low-severity fire regimes, fuels tend to be the dominant factor influencing fire behavior, while in high-severity fire regimes weather is the primary driver of fire behavior (Halofsky et al. 2011, Hessburg et al. 2005, Jain et al. 2012, Sommers et al. 2011), both of which result in less edge and larger patch sizes than mixed-severity regimes. In mixed-severity fire regimes, the influence of fuels, topography, and weather play out across the landscape to affect fire behavior, resulting in highly variable forest structure, vegetation patterning, successional stages (Perry et al. 2011, Donato et al. 2012), and rich biodiversity (Stephens et al. 2015, DellaSala and Hanson 2015). At both local and regional scales, the influence of terrain, slope position, aspect, management actions, and ignition loading can result in a fine-scale mosaic of fire regimes (Agee 1991b, 1998, and 2005, Odion et al. 2004, Taylor and Skinner 2003), particularly in mixed-severity fire regimes.

The Vegetation Condition Class provides a discrete metric to help quantify how current vegetation is different, or departed, from the estimated historical or reference conditions helps quantify. This departure from the historical conditions can be a result of changes or disruptions in one or more ecosystem components, such as fuel composition, fire regimes, or other ecological disturbances. The planning area expresses a gradient of very low to very high vegetation condition departure, with 57 percent of acreage in the low to moderate departure category and approximately 36 percent moderately departed, and 6 percent in a highly departed condition (**Table 6-17**.)

Table 6-17. Vegetation condition class acreage and percent distribution within the planning area

Vegetation Condition Class	Departure Description	Acres	Percent of Planning Area
I.A	Very low, vegetation departure 0%–16%	409	0.2%
I.B	Low to moderate, vegetation departure 17%–33%	93,710	57%
II.A	Moderate to low, vegetation departure 34%–50%	14,372	9%
II.B	Moderate to high, vegetation departure 51%–66%	46,767	28%
III.A	High, vegetation departure 67%–83%	6,382	4%
III.B	Very high, vegetation departure 84%–100%	3,230	2%

Fuel Condition – Fire Hazard

The variety of coniferous forest and non-conifer woodlands and shrublands within the planning area (See Sections 6.22 and 6.23) exhibit a wide variety of conditions, differing by slope, aspect, elevation, and soil transitions, creating a mosaic of fuel types within the planning area. Distribution can be generally described with non-conifer systems typically occur at lower to mid-elevations on drought-prone foothills (i.e., the south facing expanse of the Soda Mountain Wilderness), but also occur in patches intermixed with conifer forest at higher elevation montane environments. The surface fuel loading characterization across this mosaic of vegetation is distributed relatively evenly, with approximately one third of the planning area categorized as each moderate loading of grass-shrub fuels, moderate loading mixed conifer-hardwood, and very high load mixed conifer hardwood (**Table 6-18**).

Table 6-18. Approximate acreage and distribution of surface fire behavior fuel models grouped by loading category descriptions and corresponding standard fire behavior fuel models numbers (Scott and Burgan 2005) across the planning area.

Fuel Loading Description Categories (Surface Fire Behavior Fuel Models)	Planning Area	
	Acres	Distribution
Low load grass (101,102)	11,008	7%
Low load grass-shrub (121,141,144)	4,451	3%
Moderate load grass-shrub (122,123,142)	45,414	28%
Non-burnable (91,92,93,98,99)	2,812	2%
High load shrub (145,147)	562	0%
Low load mixed conifer - hardwood (181,182,161)	2,851	2%
Moderate load mixed conifer - hardwood (162,183, 186, 188)	36,590	23%
High load conifer (184,185,187)	8,521	5%
Very High load mixed conifer - hardwood (165,189)	50,339	31%

Fire Occurrence

Over the past two decades (2002–2021) there have been a total of 163 fires burning within the Oregon portion of the planning area, averaging 9 wildfire ignitions annually (**Table 6-19**). See also **Map 6-9.** Cascade-Siskiyou National Monument - Historical Fire Perimeters. These fires have burned a total of 70,283 acres across multiple jurisdictions. There were two wildfires during

this period that account for approximately 73,926 of these acres (see large wildfire trends section below). Additionally, 76 percent of all wildfires were less than 0.25 acres and 20 percent of all fires were between 0.25 and 10 acres, while less than 1 percent of wildfires account for the greatest number of acres burned during these two decades (**Table 6-20**). During this period 49 percent of all ignitions were attributed to human or miscellaneous cause, while lightning ignited 51 percent of fires (**Table 6-20**).

Table 6-19. Wildfire acres and count by year and cause within the Medford District BLM boundary (2002 and 2021)

Fire Count and Acres	Fire Cause	
	Human and Miscellaneous	Lightning
Total number of fires	81	82
Average number fires/year	4	5
Acres Burned	86	70,283

Based on ODF (2021).

Table 6-20. Wildfire cause and size distribution within the Oregon portion of the planning area 2002-2021

Fire Cause	Fire Size				Grand Total
	<0.25 acres	0.25 to <10 acres	10 to <100 acres	100+ acres	
Human and Misc.	31%	14%	3%	0.5%	49%
Lightning	44%	6%	0%	0.3%	51%
Grand Total	**76%**	**20%**	**3%**	**0.9%**	**100%**

Based on ODF (2021)

Lightning typically occurs from May through October and can occur with storms producing 10s to 100s of ignitions across the region. In the recent past, multiple ignition events have on occasion overwhelmed suppression resources and have been a significant factor in the development of large wildfires within southwestern Oregon (notable years include 1987, 2002, 2013, 2014, 2018, and 2020). These large fires tend to burn during more extreme fire weather conditions, when fire behavior and growth potential exceed or challenge suppression resource availability and capabilities (Planning Level 4 and 5; NIFC 2014). This pattern of fire on the landscape is contrary to historic patterns of frequent fires burning throughout the dry season under various weather conditions across the landscape. Additionally, the planning area can experience autumn east winds that occur when stable air pushes across a mountain range and then descends on the leeward side. The air becomes warmer and drier as it descends and can lead to increased, sometimes extreme fire behavior in lower lee side locations.

Wildfire Risk and WUI

Much of the planning area has a checkerboard pattern of ownership of intermixed private, state, Bureau of Reclamation and BLM-administered lands. The private lands within the planning area are comprised of rural residential, small communities of Greensprings, Lincoln, and Pinehurst, and private and industrial forests. This is an area commonly referred to as the Wildland Urban Interface (WUI). The Community at Risk (CWPP 2019) describes a focused geographic area within the WUI, surrounding permanent dwellings (at least 1 home per 40 acres) with basic infrastructure and services, under a common fire protection jurisdiction, government, or Tribal trust or allotment, for which there is a significant threat due to wildfire (**Map 6-10.** Cascade-Siskiyou National Monument – Wildfire Risk. BLM-administered lands comprise 43% and private lands account for 56% of the Community at Risk (**Table 6-21**).

Table 6-21. Ownership and acreage distribution of the Community at Risk within planning area

Ownership	Acres	Distribution
Bureau of Land Management	10,879	43%
Bureau of Reclamation	53	0.2%
Private	14,201	56%
State	82	0.3%

Adapted from ODF 2006; CWPP 2019

The Pacific Northwest all-lands, Quantitative Wildfire Risk Assessment provides a robust analysis of wildfire risk of large fires to collaboratively identified HVRAs, or Highly Valued Resource or Asset, incorporating best available science. This assessment, led by the Forest Service, brought together many cooperators to regionally refine nationally developed LANDFIRE surface fuel models, collectively identify HVRAs, assign relative importance to HVRAs, and develop response functions for those HVRAs to varying fire intensity levels. Then, tens of thousands of fire seasons were simulated to derive expected (probable) negative impacts and positive effects from wildfire (Gilbertson-Day et al. 2018). The results of expected change to all HVRAs as summarized by watershed indicate that there is a mix of wildfire risk across the planning area, shown on **Map 6-10.** Cascade-Siskiyou National Monument – Wildfire Risk.) The majority of the planning area is classified as moderate risk but ranges from very high wildfire risk to low benefit from wildfire.

Fuels Management

The multi-jurisdictional landscape increases the inherent complexities of fuel reduction efforts, particularly prescribed burning, and fire management operations, including managing wildfires to meet resource and land use objectives due to the risk of affecting adjacent lands (USDI BLM 2008). Within the planning area, the BLM implemented just over 6,000 acres of prescribed fire between 1949 – 2000 (**Table 6-22**), which was largely associated with treating activity fuels generated from commercial harvest. In recent years, prescribed fire implementation has been declining, with just over 2,000 acres implemented between 2000-2007 and just over 1,000 acres of implementation from 2008-2022 (**Table 6-22**) and has shifted toward burning associated with non-merchantable thinning.

Table 6-22. Acres of prescribed fire implemented by treatment type and time period

Time Period	Underburn/ broadcast burn	Hand Pile Burn	Machine Pile Burn[a]	Grand Total
1949-2000	1,283	244	4,733	6,259
2000-2007	630	939	715	2,284
2008-2022	107	936	164	1,206
				9,750

[a] Machine pile burning is typically associated with thinning of merchantable trees, while hand pile burning is typically associated with thinning of non-merchantable trees. Data only represent treatments occurring within the Oregon portion of the planning area.

The pace and scale of fuels reduction on private lands within the planning area has experienced a recent uptick. For example, the Natural Resources Conservation Services, from 2018 to 2022, planned, obligated, and implemented Environmental Quality Incentive Program Fuels Reduction contracts within the Greensprings Conservation Implementation Strategy area with 40 individual private landowners, covering approximately 2,491 acres of Private Non-Industrial Forestland, obligating approximately $2,563,468 in financial assistance.

Wildfire Management

The 2009 Guidance for Implementation of Wildland Fire Management Policy requires development of FMPs. The purpose of the Fire Management Plan (FMP) is to describe how fire management strategies and tactics will protect values and provide tools to meet resource goals and objectives. Currently, the various Administrative Units within the CSNM Planning area manage wildland fire consistent with the FMPs in place that tier to decisions made in the Resource Management Plans (RMPs) covering the respective Administrative Unit.

The Medford District BLM Fire Management Program and the Oregon Department of Forestry (ODF) have agreed to operate under the guidance of the Western Oregon Operating Plan, which is tiered from the NWCG Master Cooperative Wildland Fire Agreement. This Operating Plan provides direction in suppression, prevention, and detection of wildland fires on Medford District BLM-administered public lands. The BLM Lakeview District is responsible for Fire Management on BLM-administered lands within the Lakeview BLM District. The Memorandum of Understanding (BLM-OR932-2309) between USDOI BLM OR/WA and USDOI BLM CA outlines that BLM CA retains emergency fire management decisions as it relates to CalFire's involvement in the protection of the 5,000 acres of the CSNM in Northern California.

The multi-jurisdictional landscape increases the inherent complexities of fire management and operational space, including managing wildfires to meet resource and land use objectives due to the risk of affecting adjacent private lands (USDI BLM 2008).

Emergency Stabilization and Rehabilitation

The purpose of the Post-Wildfire Recovery program (Emergency Stabilization and Burned Area Rehabilitation) is to reduce the risk of resource damage and restore landscapes impacted by wildfire and to promote long-term restoration and recovery objectives. If deemed necessary by agency personnel, The BLM can initiate either an Emergency Stabilization or a Burned Area Rehabilitation (BAR) Plan after a wildfire occur to apply and compete for National Office of Wildfire Fire funds. The Emergency Stabilization and BAR Plans are completed in response to fires that occur within a given fire season and are usually combined into a single document, an initial plan is due within 7 days of wildfire containment and the final plan is due 21 days within containment. For example, Emergency Stabilization and BAR activities (e.g., noxious weed treatments, cattleguard and road sign replacement, culvert and ditch cleaning, hand mulching and native seeding for erosion control, hazard tree removal, seedling planting, and livestock closure repair) were completed in areas of the Oregon Gulch Fire, including some activities within small portions of the planning area.

6.28.2 Trends

Wildfire Climate

Ongoing changes to climate in southwestern Oregon include increasing temperatures, increasing drought frequency and severity, reduced snowpack, as well as fewer but more extreme precipitation events. Douglas-fir is anticipated to decline, particularly in lower elevations. Tree mortality will increase due to the interactions of changing climate with disturbance events such as drought, fire, insects, and diseases.

Species composition will likely shift, and growth rates and overall site productivity will decline (USDI BLM 2016b, pp. 193-196). “Not only does drought reduce tree growth and increase the likelihood and severity of fire, but prolonged or severe moisture stress can also increase the susceptibility of trees to insects and pathogens” (Bennett 2018, p. 7). Tree species differ in their vulnerability ratings to climate-induced stress (USDI BLM 2016b, p. 187). Insects and pathogen outbreaks may increase with hotter temperatures and more frequent periods of drought. These trends are already taking holding in meaningful ways across southwest OR. Prior to 2015, Douglas-fir mortality in the region tended to increase for a year or two during or immediately after drought and then subside. But since 2015, mortality levels have remained high. Based on aerial survey data, more trees died in the four-year period from 2015 to 2019 than in the previous four decades. We don’t have complete data yet for 2020-2022, but field surveys suggest mortality levels have remained high. This is apparent in the western portions of the planning area and drought is prompting mortality in fire-intolerant White Fir, as well at higher elevations in the planning area (See also **Section 6.22**, Vegetation – Forest Lands). Potential implications of excessive conifer mortality for fire management and firefighter safety include increased flame length and long-range spotting, increased fireline construction time, reduction in effective safety zones, extreme risks to firefighters from falling snags (standing dead trees), challenges for predicting fire behavior, and increased cost and duration of wildfires.

In reviewing the U.S. Drought Monitor Categories for Jackson, Klamath, and Siskiyou Counties, the trend over the past two decades indicates that projections of increased drought are on track (**Figure 6- 22**). Along these lines, a recent USDA forest health report for Oregon finds that aerial survey and site visit trends “indicate that drought stress is one of the main causes of tree dieback and decline” (USDA 2020, p. 5). Additionally, it is well understood in fire science that hotter and drier fire environments breed more extreme fire weather, fire behavior, and fire effects.

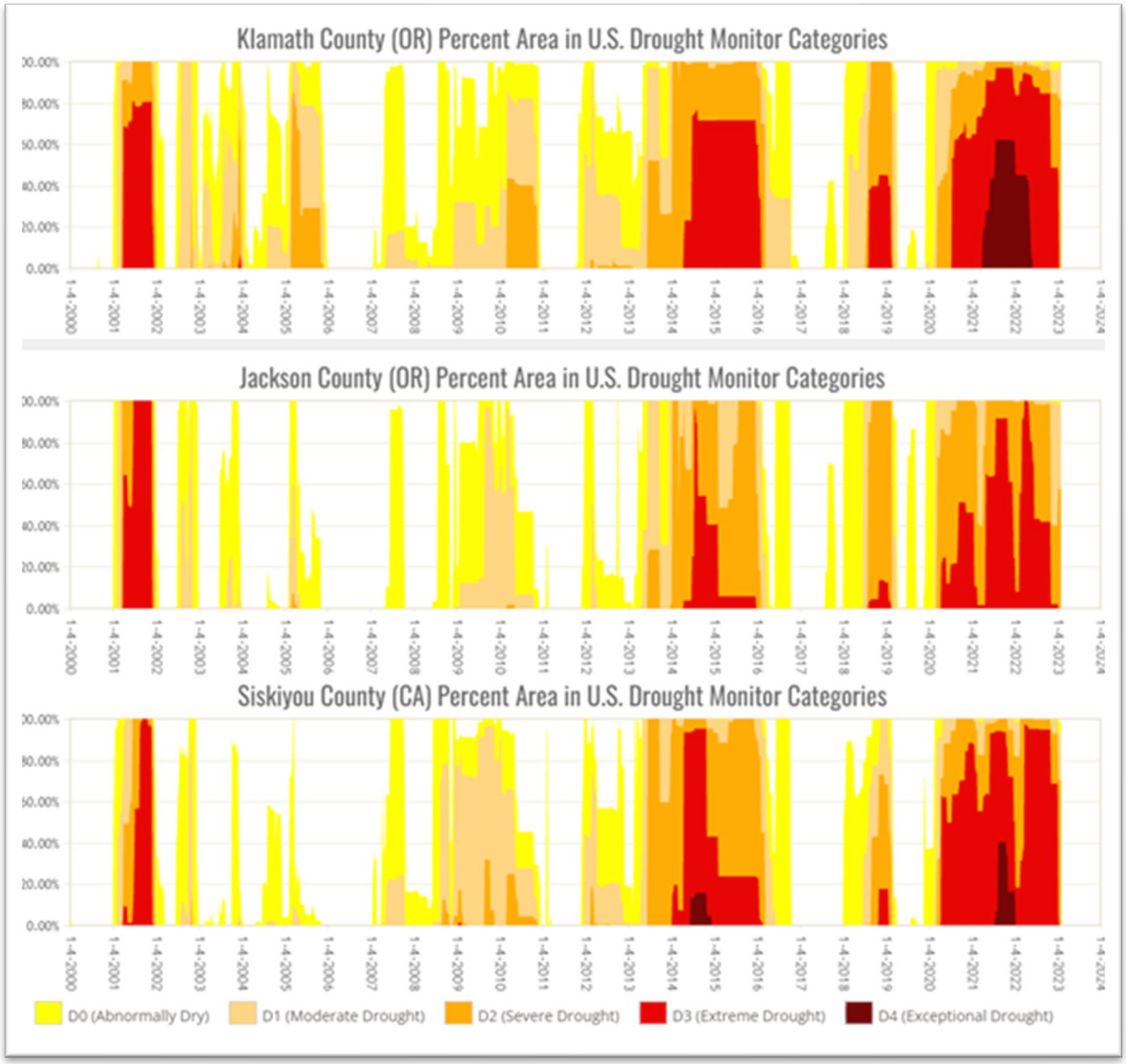

Figure 6-22. U.S. Drought Monitor Category graphs displaying percent areas in various drought categories for Klamath, Jackson, and Siskiyou counties from January 2000 to February 2023

Reprinted from https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx

Large Fire

In recent decades, there has been growing concern over cost and lasting effects of large wildfires (Ingalsbee and Raja 2015). In part, this prompted Congress to pass the 2009 FLAME Act (43 U.S.C. 1701). This Act directed the Secretary of Agriculture and the Secretary of the Interior to submit a joint strategy to address major wildland fire issues in the United States through the enhancement and development of fire-adapted communities, effective and efficient wildfire response, and resilient landscapes.

Landscape patterns of wildfire size distribution and occurrence have shifted overtime within the Medford District with frequent fire effectively ending around 1850 (Metlen et al. 2018). Metlen et al. (2018) found 90 percent of historic fire return intervals to be between 3 and 30 years, with median return intervals of 8 years. This is aligned with other fire history research in the region (USDI BLM 2016b, p. 225)

Despite frequent fire activity ending in 1850, with forceable removal of indigenous populations, fire records from 1900 to 1939 still display considerable fire activity, largely associated with mining and timber harvest relative to more recent time periods. The average annual average number of large fires (1900 -1939) was also greater between 1900 and 1939, than the other time periods, which was lowest between 1980-1999, where there was only 1 large fire (Refer to **Table 6-23** and **Map 6-9.** Cascade-Siskiyou National Monument - Historical Fire Perimeters). Between 1940 – 1979 the total number of large wildfire acreage decreased dramatically from the previous 40-year period. These fires occurred on the heels of widespread use of mechanized equipment and the establishment of the Cave Junction Smoke Jumper Base in 1940 (Atzet 1996) and under fuel conditions conducive to effective fire suppression. Fire activity came to all but a grinding halt during the period between 1980 and 1999, with one large fire. Fire suppression was effective and it was a relatively cooler climatic period. From 2000 to present, total wildfire acreage has nearly doubled the 1900-1930 period. Two fires account for most of this acreage, Oregon Gulch (2014) and Klamathon (2018). Fires during this period are occurring in fuels accumulated from years of missed fire cycles, intensely managed landscapes, and under warming climatic conditions (Westerling et al. 2006).

Table 6-23. Historic large fire occurrence, acreage, number of fires, average and median fire size by time periods, burning into the planning area

Eras	Total Wildfire Acres	Total Number of Fires	Average Annual Number of Fires	Average Fire Size	Median Fire Size
1900-1939	45,324	45	1	1,007	557
1940-1979	2,340	5	0.1	468	123
1980-1999	360	1	0.05	360	360
2000-2021	77,316	10	0.5	7,732	31

In 2014 and 2018, the most notable large wildfires (Oregon Gulch (July 30, 2014) and Klamathon (July 5, 2018)) to burn portions of the planning area were similarly sized. The Oregon Gulch fire started from a multiple ignition thunderstorm event generating 2,000-2,500 lighting strikes in southern Oregon, during a period of intense drought, peppered by red flag warnings, and amidst elevated preparedness levels (**Figure 6-23**). During the initial growth days, the Oregon Gulch fire exhibited extreme fire behavior, including long range spotting and pyro cumulus, visible from Medford, OR. The human-caused Klamathon fire started earlier in the fire season at low elevation and burned mostly south facing hot and dry aspects. Burn severity patterns had variable distribution across both Oregon Gulch and Klamathon fires. For the entire wildfire areas and portions within the planning area, approximately 30 percent of the Oregon Gulch wildfire burned at low severity, while approximately 60 percent of the Klamathon wildfire burned at low severity, inching closer to within historic fire regime burn severity proportions.

Naturally, this translated to the Oregon Gulch wildfire having greater proportions of high and moderate severity than the Klamathon wildfire (**Table 6-24**), particularly in large areas of even aged forest, such as that shown in **Figure 6-24**.

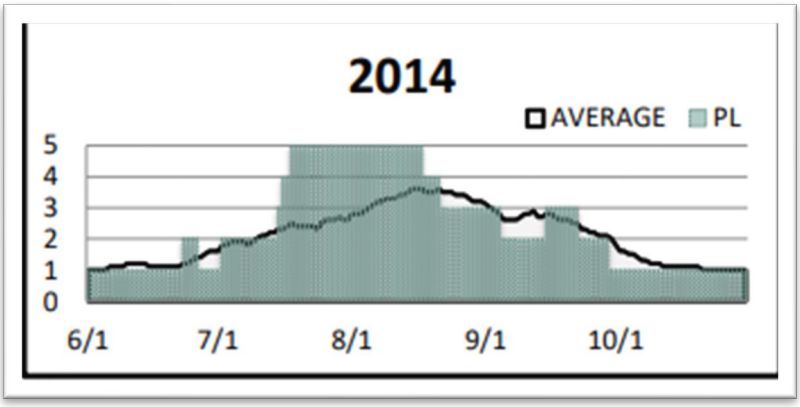

Figure 6-23. Pacific Northwest Wildfire Coordination Center 2014 fire preparedness levels, compared with average

Table 6-24. Oregon Gulch and Klamathon burn severity data for entire fire and area within planning area

Burn Severity Category	OREGON GULCH				KLAMATHON			
	Entire Fire Acreage		Planning Area Acreage		Entire Fire Acreage		Planning Area Acreage	
Unburned	7,587	21%	151	11%	1,924	4%	420	5%
Low	10,690	30%	423	31%	23,504	58%	6,569	61%
Moderate	12,439	35%	543	40%	10,285	29%	3,296	27%
High	4,690	13%	256	19%	2,807	9%	1,010	7%
TOTAL (Acres)	**35,406**		**1,372**		**38,520**		**11,296**	

Data Source: Monitoring Trends in Burn Severity (https://www.mtbs.gov/).

Figure 6-24. Oregon Gulch fire, which burned through extensive areas of even-age forest

6.28.3 Forecasts

Based on trends in the last 30 years, humans and lightning will continue to provide wildfire ignition sources (USDI BLM 2016b, Table 3-22 p. 227), and future trends suggest the suitability for large wildfire growth will increase (USDI BLM 2016b, Appendix D, Figure D-8 p. 1241; Davis et al. 2017). Fire suppression efforts are expected to continue; however, these efforts are not 100 percent successful. In fact, less than one percent of fires in the recent past account for most of the acres burned by wildfire (USDI BLM 2016b, p. 227). These large fires tend to burn during more extreme fire weather conditions, potentially resulting in high fire severity (Long et al. 2017), when fire behavior and growth potential exceed or challenge suppression resource availability and capabilities. However, successful suppression efforts will continue to exclude fire and disturbance regimes will continue to be altered; these aspects, coupled with other expected climatological changes, such as increased background tree mortality, due to longer periods of hot drought (USDI BLM 2016b, p. 185), increase the likelihood for larger proportions of high severity fire (Mote et al. 2019).

In recent decades, the frequency of large wildfires and the annual acres burned have increased across the western states (Westerling et al. 2006) and in Oregon (ODF 2022). Modeled projections indicate this trend will continue (Mote et al. 2014). Based on an analysis of fire start dates for wildfires greater than 1,000 acres, Westerling et al. (2006) found that the fire season is already longer than it was in the 1980s by at least a month. With observed increase in mean summer temperatures, earlier snowmelt, and lower summer soil and fuel moisture, some climate changes have already begun to manifest and point to longer periods of time when fires have the

potential to burn (Halofsky et al. 2022). These changes in climate strongly correlate with increasing wildfire size, large wildfire frequency, and longer wildfire durations (Westerling et al. 2006, Littell et al. 2010, Miller et al. 2012).

These observed trends and forecasts suggest that wildfire will continue to be a major change agent, interacting with other disturbance agents (e.g., drought and insect outbreaks) and affecting ecosystems and vegetation structure. Forecasts indicate that the number of fires escaping initial attack is likely to increase, along with area burned, and the occurrence of very large fires (greater than 5000 ha or approximately 12,000 acres) (Halofsky et al. 2022). The forecasted implications to future fire severity are mixed, given that a warmer temperature coupled with increased precipitation during the growing season could lead to an increase in vegetation biomass (i.e., fuel), promoting high severity fire. However, increased fire frequency is likely to result in repeat fire and reduce fuel load over time, however the implications of multiple overlapping fires and short-interval reburn periods can lead to compounding unknown effects on species regeneration, composition, vegetation type and structure (Halofsky et al. 2022). It is possible that future climate will propagate novel vegetation communities in southwest Oregon, however the current representation of communities has persisted and evolved through past climatic changes and many species now are expected to find proximal niches to persist (Halofsky et al. 2022).

Chapter 7. Alternatives Framework

An alternative is a combination of proposed land use allocations, management objectives, and management direction designed to meet the stated purpose and need for a planning effort (see Chapter 4, Purpose and Need). Alternatives explore the various ways the BLM could manage these lands within the legal and policy framework guiding the planning effort (see Chapter 3, Regulatory Framework).

The purpose (the specific goal of the agency's proposed action) and the need (the broader underlying agency need or legal requirement to which the agency is responding) largely determine what constitutes a range of reasonable alternatives. "Reasonable alternatives" means a range of alternatives that are technically and economically feasible and that meet the purpose and need for the proposed action (40 CFR 1508.1(z)). All reasonable alternatives must be rigorously explored and objectively evaluated. Further, other alternatives eliminated from detailed study must be included with a brief discussion of the reasons for eliminating them (43 CFR 1610.4-5).

The range of alternatives must also include consideration of a No Action alternative (40 CFR 1502.14(c)). The Council on Environmental Quality (CEQ) guidance explains that for plans, such as this RMP, No Action means there is no change from current management direction or level of management intensity (CEQ 1981). In other words, "no action" may be considered a continuation of the present course of action until that action is changed.

The BLM will develop alternatives that change how decisions for resource protection and resource uses occur on the landscape and identify management areas, where appropriate, to address geographical areas where complementary objectives and management direction occur.

The BLM has identified the following preliminary range of alternatives for consideration and is seeking your input at this time. The preliminary alternatives are exploratory and are a starting point to the formulation of alternatives.

7.1 No Action Alternative

The No Action alternative for land use planning means continuation of current management. The No Action alternative for this planning process does not meet the purpose and need; however, it serves the following functions:

- Clear understanding of what guides management in the absence of a new EIS, RMP, or ROD for management of the CSNM;
- the alternative for analysis of effects that are occurring in the absence of a revised RMP (baseline of effects); and
- the basis for development of action alternatives and consideration of trade-offs.

As described in Section 2.1, History of the CSNM, President Obama through Presidential Proclamation 9564, enlarged the boundary of the CSNM and appropriated and withdrew "all federal lands and interests in lands within the enlarged boundary all forms of entry, location, selection, sale, or other disposition under the public land laws from location, entry and patent under the mining laws and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the monument" (82 FR 6145, January 18, 2017). Proclamation 9564 also states that "The Secretary of the Interior (Secretary) shall manage the area being added to the monument through the Bureau of Land Management as a unit of the National Landscape Conservation System, under the same laws and regulations that apply to the rest of the monument, except that the Secretary may issue a travel management plan that authorizes snowmobile and non-motorized mechanized use off of roads in the area being added by this proclamation, so long as such use is consistent with the care and management of the objects identified above."

The BLM-administered lands in the planning area are now divided between and currently managed under three different RMPs. See Section 2.3, Existing Management for a description of the current management direction.

In response to Proclamation 9564, multiple plaintiffs sued the President and BLM, claiming that the Monument expansion violated the 1937 Oregon and California Railroad and Coos Bay Wagon Road Grant Lands Act of 1937 (O&C Act). In 2017, two plaintiffs filed separate suits in the U.S. District Court for the District of Columbia. A third plaintiff filed suit in the District of Oregon. In September 2019, the District of Oregon upheld the Monument expansion, and the U.S. Court of Appeals for the Ninth Circuit affirmed the District Court in April 2023. In November 2019, the District Court for the District of Columbia found the Monument expansion violated the O&C Act by "reserving land governed by the O&C Act from sustained yield timber production" and held Proclamation 9564 "invalid and unenforceable as applied to land subject to the O&C Act." The government appealed this decision to the U.S. Court of Appeals for the District of Columbia. While the outcome of this appeal is uncertain, the BLM is exercising its discretion to initiate planning steps with the understanding that BLM retains the ability to modify or terminate any planning effort in response to the outcome of the litigation. The eventual size of the decision area will need to be consistent with the litigation outcome.

Also described in Section 2.1, History of the CSNM, there are several new Congressional Designations that apply to lands in the planning area.

In March 2009, Congress designated the now 24,707-acre Soda Mountain Wilderness in the original boundary of the CSNM (Public Law 111-11, Section 1405). The Wilderness Act of 1964 and BLM Manual 6340, Management of BLM Wilderness requires the BLM to:

- Manage and protect BLM wilderness areas in such a manner as to preserve wilderness character.
- Manage wilderness for the public purposes of recreational, scientific, scenic, education, conservation, and historic use while preserving the wilderness character.
- Effectively manage uses permitted under section 4(c) and 4(d) of the Wilderness Act of 1964 while preserving wilderness character.

- Wilderness character is composed of four mandatory qualities, and a fifth, optional, quality. These are: 1) untrammeled 2) natural 3) undeveloped 4) solitude or primitive and unconfined recreation 5) unique, supplemental, or other features (ecological, geological or other features of scenic, scientific, educational or historic value).

In September 2011, the BLM prepared the Soda Mountain Wilderness Stewardship Plan and Environmental Assessment (DOI-BLM-ORWA-M040-2011-0001-EA). The Final SMW Stewardship Plan was completed in April 2012.

In 2009, Congress also authorized the Secretary to accept any grazing lease that is donated by a lessee and to terminate any grazing lease acquired (Public Law 111-11, Section 1402(a)(1)(A-B). Congress directed that the Secretary also not issue any new grazing leases on those lands and ensure a permanent end to livestock grazing on those lands (Public Law 111-11, Section 1402(a)(1)(C)). Additional provisions were described related to donations of portions of grazing leases and modifications to authorized levels of grazing, as well as identifying the permanent end to livestock grazing in the Agate, Emigrant Creek, and Siskiyou allotments in and near the planning area (Public Law 111-11, Section 1402(a)(2-3) and (b)).

In March 2019, Congress designated 17.6 miles of Jenny Creek and 1.1 miles of Spring Creek as scenic rivers under the Wild and Scenic Rivers Act (WSRA) (Public Law 116-9). Both streams are primarily in the CSNM but also cross into the decision area for the SWO RMP (see **Map 2-1.** Cascade-Siskiyou National Monument - Boundary Changes and Other Designations).

In addition to the three ORVs identified by the BLM during its eligibility assessment (resident fish, wildlife, and historic), the Congressional Record provided a description of Jenny Creek as having recreational, scenic, and ecological/biological diversity ORVs. Spring Creek was described as having scenery, wildlife, and fish ORVs in the Congressional Record.

The BLM has not started the process to develop a comprehensive river management plan for these rivers which will make final ORV determinations and will define the goals and desired conditions for protecting river values. In the interim, the BLM follows the requirements of the WSRA and BLM policy and direction for designated Wild and Scenic River (WSR) management.

The WSRA and BLM Manual 6400, Wild and Scenic Rivers for Identification, Evaluation, Planning and Management requires the BLM to, subject to valid existing rights, protect and enhance the free-flowing condition, water quality, and ORVs of each designated WSR.

7.2 COMMON TO ALL ACTION ALTERNATIVES

The following features would apply to all alternatives analyzed in detail, except the No Action alternative. They are typically required by law, regulation, or policy, and are not discretionary. Under all action alternatives, the BLM would do the following:

- Honor valid existing rights[7].
- **Designated Wilderness** - Manage the designated Soda Mountain Wilderness to preserve the wilderness character, consistent with the Wilderness Act of 1964, BLM wilderness policy (Policy Manual 6340) and the Soda Mountain Wilderness Stewardship Plan (USDI BLM 2012).
- **Designated Wild and Scenic Rivers** - Manage the Jenny Creek and Spring Creek Wild and Scenic Rivers to protect and enhance the values for which they were designated (BLM Manual 6400, Wild and Scenic Rivers).
- **Minerals** - Per Proclamations 7318 and 9564, all lands in the planning area are withdrawn from locatable and leasable mineral entry, locations, selection, sale or leasing, subject to valid existing rights. Common variety minerals (quarry rock) cannot be sold but would be made available for BLM administrative use by a free use permit where it would not conflict with the protection of CSNM objects and values.
- **Lands and Realty –** Per Proclamations 7318 and 9564, all lands in the CSNM (planning area) are appropriated and withdrawn from disposal, other than by exchange that furthers the protective purposes of the Monument.
- **Wildfire Response** – The Medford District BLM Fire Management Program and the Oregon Department of Forestry (ODF) have agreed to operate under the guidance of the Western Oregon Operating Plan, which is tiered from the National Wildfire Coordinating Group (NWCG) Master Cooperative Wildland Fire Agreement. This Operating Plan provides direction for suppression, prevention, and detection of wildland fires on Medford District BLM-administered lands. The BLM Lakeview District is responsible for Fire Management on BLM-administered lands within the Lakeview BLM District. The Memorandum of Understanding (BLM-OR932-2309) between USDI BLM OR/WA and USDI BLM CA outlines that BLM CA retains emergency fire management decisions as it relates to CalFire's involvement in the protection of the 5,000 acres of the CSNM in Northern California.

7.3 PRELIMINARY RANGE OF ACTION ALTERNATIVES

Vegetation - The BLM will explore a range of alternatives that would include the designation of management areas designed to respond to the purpose and need for action (e.g., habitat management areas). The size, location, and management objectives of these management areas

[7] Valid existing rights are those rights in existence within the boundaries of the Cascade-Siskiyou National Monument before the monument was established; June 9, 2000 for lands in the original boundary (Proclamation 7318) and January 18, 2017 for lands in the enlarged boundary (Proclamation 9564). Valid existing rights were established by various laws, leases, and filings made with the BLM.

would vary among the action alternatives, as would the management direction within these management areas.

The BLM will also explore management actions, including a range of vegetation treatments and prescribed fire in strategic areas within the wildland urban interface to 1) improve opportunities to limit large wildfire growth by creating strategic fuel breaks and buffers around Communities at Risk and 2) reducing fire hazard in younger plantations (less than 60 years) by thinning to moderately variegate the stand's structure.

The BLM will explore where opportunities for science-based ecological restoration aimed at meeting protection and old-growth enhancement objectives would be needed based on vegetative conditions and other factors.

The BLM will ensure that all vegetation management actions adhere to the Proclamation's restrictions, which are as follows:

> "The commercial harvest of timber or other vegetative material is prohibited, except when part of an authorized science-based ecological restoration project aimed at meeting protection and old growth enhancement objectives. Any such project must be consistent with the purposes of this proclamation. No portion of the monument shall be considered to be suited for timber production, and no part of the monument shall be used in a calculation or provision of a sustained yield of timber. Removal of trees from within the monument area may take place only if clearly needed for ecological restoration and maintenance or public safety" (Presidential Proclamation 7318, 65 FR 37249).

Areas of Critical Environmental Concern (ACECs) and Research Natural Areas (RNAs) - The BLM will evaluate existing ACECs and RNAs and any nominated ACECs. For areas that meet the relevance and importance criteria, the BLM would determine if the relevant and important values are protected by management actions under each alternative or whether designation is needed or not.

Eligible and Suitable Wild and Scenic Rivers - The BLM will evaluate all eligible Wild and Scenic River segments in the planning area and determine which are suitable or non-suitable per Section 5(d)(1) of the Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271 et seq.). The BLM will evaluate the suitability of rivers for designation through the development of alternatives "that shall, at a minimum, include a no action alternative, a national designation of all eligible segments of the river, and non-suitable" (BLM Policy Manual 6400, Section 4-3.).

Lands and Realty - The BLM will evaluate a range of alternatives related to the designation of right-of-way (ROW) exclusion and/or avoidance areas. The BLM will also evaluate a range of alternatives related to the designation of utility corridors within the CSNM. Alternatives will address whether any existing or proposed corridors are compatible with the protection of the CSNM's objects and values and/or whether any existing designated utility corridors should be relocated outside the CSNM (see BLM Manual 6220, Section 1.6 E. 8.).

Livestock Grazing - The BLM will explore within the range of alternatives varying which lands would be available or unavailable for grazing, including but not limited to a no grazing alternative, available allotments continue as is, and proposing modifications to the allotment

boundaries. In addition, the BLM will explore varying grazing management practices, such as grazing systems, range improvements (including land treatments), and changes in seasons of use and/or stocking rates on lands available for grazing. Grazing management practices will be designed in a manner than protects CSNM objects and values, unless otherwise provided for in law (BLM Manual 6220, Section 1.6.I.2).

National Scenic and Historic Trails - The BLM will designate national trail management corridors for the Pacific Crest National Scenic Trail (Public Law No: 90-543) and the California National Historic Trail (Public Law No: 102-328), as directed by BLM Manual 6250 and 6280, National Scenic and Historic Trail Administration, and Inventory and Monitoring respectively. The BLM will explore within the range of alternatives varying the size of the corridor depending on scenic values, as well as other competing resource and allowable management activities consistent with the Nature and Purposes of the trails.

Recreation and Visitor Services - The BLM will explore how to effectively manage recreation and visitor services through:

- the designation of recreation management areas (RMAs);
- establishing recreation and visitor services objectives for each RMA; and
- identifying management actions and allowable uses for each RMA.

The BLM would designate RMAs based on recreation demands and issues, Recreation Setting Characteristics, resolving use/user conflicts, compatibility with other resource uses, and resource protection needs.

Travel and Transportation - All travel management planning components of the CSNM RMP would conform to the BLM's responsibilities under the Monument's Presidential Proclamations, 43 CFR 8342.1, and BLM Manual 1626, Travel and Transportation. At a minimum, the BLM will address the following travel management planning components:

- Designate areas as 'limited' or 'closed' to off-highway vehicle (OHV) use in accordance with 43 CFR 8342.1 and consistent with Proclamations 7318 and 9564. Develop a reasonable range of OHV allocations in relationship to various management areas and management objectives among the alternatives.
- If determined appropriate, evaluate a range of area-level OHV designations for over-the-snow travel and non-motorized mechanized use off roads per the direction provided in Proclamation 9564.
- Defer implementation level Travel and Transportation Management planning until after completion of the RMP revision process. For those areas designated as 'limited' in the RMP, define interim management objectives and clearly identify the process leading from the interim area designation of 'limited to existing roads, primitive roads and trails' to the development of a designated network of roads, primitive roads and trails, consistent with BLM Handbook 8342.
- Outline a strategy to complete a subsequent implementation-level travel management plan that comprehensively designates roads, primitive roads, and trails for OHV,

snowmobile, non-motorized mechanized, and/or other modes of travel in the RMP's decision area.

- The BLM will consider identifying travel management areas (TMAs) in the CSNM RMP in order to complete more defined travel management plans in geographically smaller areas. The BLM would follow the guidance provided in BLM Handbook 8342, Travel Management Areas.

Visual Resources - The BLM will develop a range of VRM classification scenarios in relationship to various management areas and management objectives among the alternatives.

7.4 ADDITIONAL POTENTIAL ALTERNATIVES

The BLM is interested in additional potential alternatives from the public, Tribal Nations, other federal agencies, and state and local government for consideration in the land use planning effort. The BLM will explore all proposed reasonable alternatives. To be considered reasonable, they must be within the BLM's decision space for this plan; they must meet the purpose and need; and they must be consistent with federal laws, regulations, and policies.

- Consider opportunities for co-stewardship arrangements as part of Tribal Consultation and engagement during this planning effort, consistent with PIM 2022-011, Co-Stewardship with Federally Recognized Indian and Alaska Native Tribes Pursuant to Secretary's Order 3403.

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8.5 CHAPTER 7

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APPENDIX A. CSNM PRESIDENTIAL PROCLAMATIONS

Cascade-Siskiyou National Monument Proclamation 7318, June 2000

Federal Register / Vol. 65, No. 114 / Tuesday, June 13, 2000 / Presidential Documents 37249

Presidential Documents

Proclamation 7318 of June 9, 2000

Establishment of the Cascade-Siskiyou National Monument

By the President of the United States of America

A Proclamation

With towering fir forests, sunlit oak groves, wildflower-strewn meadows, and steep canyons, the Cascade-Siskiyou National Monument is an ecological wonder, with biological diversity unmatched in the Cascade Range. This rich enclave of natural resources is a biological crossroads—the interface of the Cascade, Klamath, and Siskiyou ecoregions, in an area of unique geology, biology, climate, and topography.

The monument is home to a spectacular variety of rare and beautiful species of plants and animals, whose survival in this region depends upon its continued ecological integrity. Plant communities present a rich mosaic of grass and shrublands, Garry and California black oak woodlands, juniper scablands, mixed conifer and white fir forests, and wet meadows. Stream bottoms support broad-leaf deciduous riparian trees and shrubs. Special plant communities include rosaceous chaparral and oak-juniper woodlands. The monument also contains many rare and endemic plants, such as Greene's Mariposa lily, Gentner's fritillary, and Bellinger's meadowfoam.

The monument supports an exceptional range of fauna, including one of the highest diversities of butterfly species in the United States. The Jenny Creek portion of the monument is a significant center of fresh water snail diversity, and is home to three endemic fish species, including a long-isolated stock of redband trout. The monument contains important populations of small mammals, reptile and amphibian species, and ungulates, including important winter habitat for deer. It also contains old growth habitat crucial to the threatened Northern spotted owl and numerous other bird species such as the western bluebird, the western meadowlark, the pileated woodpecker, the flammulated owl, and the pygmy nuthatch.

The monument's geology contributes substantially to its spectacular biological diversity. The majority of the monument is within the Cascade Mountain Range. The western edge of the monument lies within the older Klamath Mountain geologic province. The dynamic plate tectonics of the area, and the mixing of igneous, metamorphic, and sedimentary geological formations, have resulted in diverse lithologies and soils. Along with periods of geological isolation and a range of environmental conditions, the complex geologic history of the area has been instrumental in producing the diverse vegetative and biological richness seen today.

One of the most striking features of the Western Cascades in this area is Pilot Rock, located near the southern boundary of the monument. The rock is a volcanic plug, a remnant of a feeder vent left after a volcano eroded away, leaving an outstanding example of the inside of a volcano. Pilot Rock has sheer, vertical basalt faces up to 400 feet above the talus slope at its base, with classic columnar jointing created by the cooling of its andesite composition.

The Siskiyou Pass in the southwest corner of the monument contains portions of the Oregon/California Trail, the region's main north/south travel route first established by Native Americans in prehistoric times, and used by Peter Skene Ogden in his 1827 exploration for the Hudson's Bay Company.

Section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431), authorizes the President, in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national monuments, and to reserve as a part thereof parcels of land, the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected.

WHEREAS it appears that it would be in the public interest to reserve such lands as a national monument to be known as the Cascade-Siskiyou National Monument:

NOW, THEREFORE, I, WILLIAM J. CLINTON, President of the United States of America, by the authority vested in me by section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431), do proclaim that there are hereby set apart and reserved as the Cascade-Siskiyou National Monument, for the purpose of protecting the objects identified above, all lands and interests in lands owned or controlled by the United States within the boundaries of the area described on the map entitled "Cascade-Siskiyou National Monument" attached to and forming a part of this proclamation. The Federal land and interests in land reserved consist of approximately 52,000 acres, which is the smallest area compatible with the proper care and management of the objects to be protected.

All Federal lands and interests in lands within the boundaries of this monument are hereby appropriated and withdrawn from all forms of entry, location, selection, sale, or leasing or other disposition under the public land laws, including but not limited to withdrawal from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the monument.

There is hereby reserved, as of the date of this proclamation and subject to valid existing rights, a quantity of water sufficient to fulfill the purposes for which this monument is established. Nothing in this reservation shall be construed as a relinquishment or reduction of any water use or rights reserved or appropriated by the United States on or before the date of this proclamation.

The commercial harvest of timber or other vegetative material is prohibited, except when part of an authorized science-based ecological restoration project aimed at meeting protection and old growth enhancement objectives. Any such project must be consistent with the purposes of this proclamation. No portion of the monument shall be considered to be suited for timber production, and no part of the monument shall be used in a calculation or provision of a sustained yield of timber. Removal of trees from within the monument area may take place only if clearly needed for ecological restoration and maintenance or public safety.

For the purpose of protecting the objects identified above, the Secretary of the Interior shall prohibit all motorized and mechanized vehicle use off road and shall close the Schoheim Road, except for emergency or authorized administrative purposes.

Lands and interests in lands within the proposed monument not owned by the United States shall be reserved as a part of the monument upon acquisition of title thereto by the United States.

The Secretary of the Interior shall manage the monument through the Bureau of Land Management, pursuant to applicable legal authorities (including, where applicable, the Act of August 28, 1937, as amended (43 U.S.C. 1181a-1181j)), to implement the purposes of this proclamation.

The Secretary of the Interior shall prepare, within 3 years of this date, a management plan for this monument, and shall promulgate such regulations for its management as he deems appropriate. The management plan shall

include appropriate transportation planning that addresses the actions, including road closures or travel restrictions, necessary to protect the objects identified in this proclamation.

The Secretary of the Interior shall study the impacts of livestock grazing on the objects of biological interest in the monument with specific attention to sustaining the natural ecosystem dynamics. Existing authorized permits or leases may continue with appropriate terms and conditions under existing laws and regulations. Should grazing be found incompatible with protecting the objects of biological interest, the Secretary shall retire the grazing allotments pursuant to the processes of applicable law. Should grazing permits or leases be relinquished by existing holders, the Secretary shall not reallocate the forage available under such permits or for livestock grazing purposes unless the Secretary specifically finds, pending the outcome of the study, that such reallocation will advance the purposes of the proclamation.

The establishment of this monument is subject to valid existing rights.

Nothing in this proclamation shall be deemed to enlarge or diminish the jurisdiction of the State of Oregon with respect to fish and wildlife management.

Nothing in this proclamation shall be deemed to revoke any existing withdrawal, reservation, or appropriation; however, the national monument shall be the dominant reservation.

Warning is hereby given to all unauthorized persons not to appropriate, injure, destroy, or remove any feature of this monument and not to locate or settle upon any of the lands thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this ninth day of June, in the year of our Lord two thousand, and of the Independence of the United States of America the two hundred and twenty-fourth.

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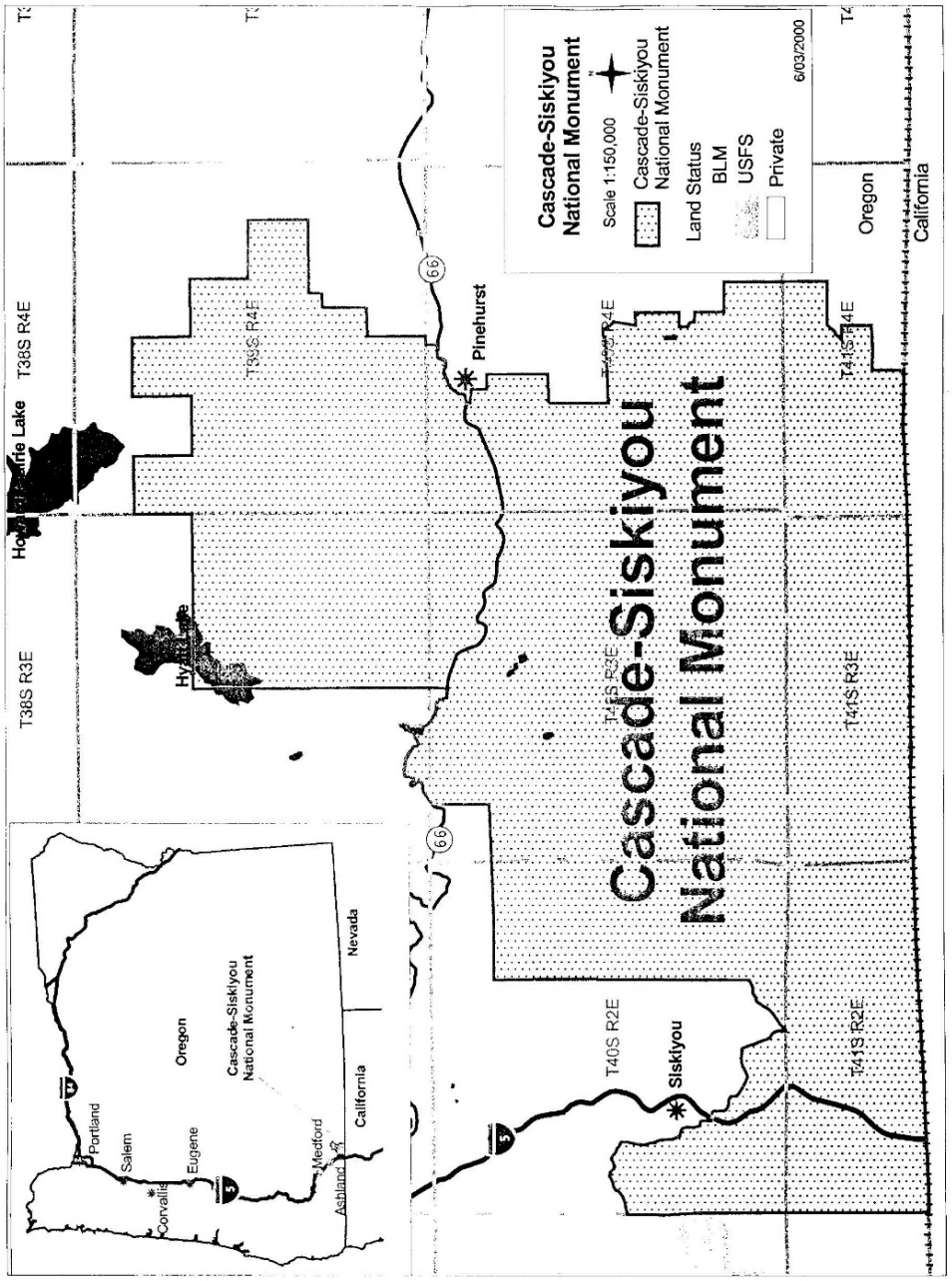

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Boundary Enlargement of the Cascade-Siskiyou National Monument Proclamation 9564, January 2017

Federal Register / Vol. 82, No. 11 / Wednesday, January 18, 2017 / Presidential Documents 6145

Presidential Documents

Proclamation 9564 of January 12, 2017

Boundary Enlargement of the Cascade-Siskiyou National Monument

By the President of the United States of America

A Proclamation

Through Proclamation 7318 of June 9, 2000, President Bill Clinton established the Cascade-Siskiyou National Monument (monument) to protect the ecological wonders and biological diversity at the interface of the Cascade, Klamath, and Siskiyou ecoregions. The area, home to an incredible variety of species and habitats, represents a rich mosaic of forests, grasslands, shrublands, and wet meadows. The many rare and endemic plant and animal species found here are a testament to Cascade-Siskiyou's unique ecosystems and biotic communities.

As President Clinton noted in Proclamation 7318, the ecological integrity of the ecosystems that harbor this diverse array of species is vital to their continued existence. Since 2000, scientific studies of the area have reinforced that the environmental processes supporting the biodiversity of the monument require habitat connectivity corridors for species migration and dispersal. Additionally, they require a range of habitats that can be resistant and resilient to large-scale disturbance such as fire, insects and disease, invasive species, drought, or floods, events likely to be exacerbated by climate change. Expanding the monument to include Horseshoe Ranch, the Jenny Creek watershed, the Grizzly Peak area, Lost Lake, the Rogue Valley foothills, the Southern Cascades area, and the area surrounding Surveyor Mountain will create a Cascade-Siskiyou landscape that provides vital habitat connectivity, watershed protection, and landscape-scale resilience for the area's critically important natural resources. Such an expansion will bolster protection of the resources within the original boundaries of the monument and will also protect the important biological and historic resources within the expansion area.

The ancient Siskiyou and Klamath Mountains meet the volcanic Cascade Mountains near the border of California and Oregon, creating an intersection of three ecoregions in Jackson and Klamath Counties in Oregon and Siskiyou County in California. Towering rock peaks covered in alpine forests rise above mixed woodlands, open glades, dense chaparral, meadows filled with stunning wildflowers, and swiftly-flowing streams.

Native American occupancy of this remarkably diverse landscape dates back thousands of years, and Euro-American settlers also passed through the expansion area. The Applegate Trail, a branch of the California National Historic Trail, passes through both the existing monument and the expansion area following old routes used by trappers and miners, who themselves made use of trails developed by Native Americans. Today, visitors to the Applegate Trail can walk paths worn by wagon trains of settlers seeking a new life in the west. The trail, a less hazardous alternative to the Oregon Trail, began to see regular wagon traffic in 1846 and helped thousands of settlers traverse the area more safely on their way north to the Willamette Valley or south to California in search of gold—one of the largest mass migrations in American history. Soon thereafter, early ranchers, loggers, and homesteaders began to occupy the area, leaving traces of their presence,

which provide potential for future research into the era of westward expansion in southwestern Oregon. A historic ranch can be seen in the Horseshoe Ranch Wildlife Area, in the northernmost reaches of California.

The Cascade-Siskiyou landscape is formed by the convergence of the Klamath, the Siskiyou, and the Cascade mountain ranges. The Siskiyou Mountains, which contain Oregon's oldest rocks dating to 425 million years, have an east-west orientation that connects the newer Cascade Mountains with the ancient Klamath Mountains. The tectonic action that formed the Klamath and Siskiyou Mountains occurred over 130 million years ago, while the Cascades were formed by more recent volcanism. The Rogue Valley foothills contain Eocene and Miocene formations of black andesite lava along with younger High Cascade olivine basalt. In the Grizzly Peak area, the 25 million-year geologic history includes basaltic lava flows known as the Roxy Formation, along with the formation of a large strato-volcano, Mount Grizzly. Old Baldy, another extinct volcanic cone, rises above the surrounding forest in the far northeast of the expansion area.

Cascade-Siskiyou's biodiversity, which provides habitat for a dazzling array of species, is internationally recognized and has been studied extensively by ecologists, evolutionary biologists, botanists, entomologists, and wildlife biologists. Ranging from high slopes of Shasta red fir to lower elevations with Douglas fir, ponderosa pine, incense cedar, and oak savannas, the topography and elevation gradient of the area has helped create stunningly diverse ecosystems. From ancient and mixed-aged conifer and hardwood forests to chaparral, oak woodlands, wet meadows, shrublands, fens, and open native perennial grasslands, the landscape harbors extraordinarily varied and diverse plant communities. Among these are threatened and endangered plant species and habitat for numerous other rare and endemic species.

Grizzly Peak and the surrounding Rogue Valley foothills in the northwest part of the expansion area are home to rare populations of plant species such as rock buckwheat, Baker's globemallow, and tall bugbane. More than 275 species of flowering plants, including Siberian spring beauty, bluehead gilia, Detling's silverpuffs, bushy blazingstar, southern Oregon buttercup, Oregon geranium, mountain lady slipper, Egg Lake monkeyflower, green-flowered ginger, and Coronis fritillary can be found here. Ferns such as the fragile fern, lace fern, and western sword fern contribute to the lush green landscape.

Ancient sugar pine and ponderosa pine thrive in the Lost Lake Research Natural Area in the north, along with white fir and Douglas fir, with patches of Oregon white oak and California black oak. Occasional giant chinquapin, Pacific yew, and bigleaf maple contribute to the diversity of tree species here. Shrubs such as western serviceberry, oceanspray, Cascade barberry, and birchleaf mountain mahogany grow throughout the area, along with herbaceous species including pale bellflower, broadleaf starflower, pipsissewa, and Alaska oniongrass. Creamy stonecrop, a flowering succulent, thrives on rocky hillsides. Patches of abundant ferns include coffee cliffbrake and arrowleaf sword fern. Moon Prairie contains a late successional stand of Douglas fir and white fir with Pacific yew, ponderosa pine, and sugar pine.

Old Baldy's high-elevation forests in the northeast include Shasta red fir, mountain hemlock, Pacific silver fir, and western white pine along with Southern Oregon Cascades chaparral. Nearby, Tunnel Creek is a high-altitude lodgepole pine swamp with bog blueberry and numerous sensitive sedge species such as capitate sedge, lesser bladderwort, slender sedge, tomentypnum moss, and Newberry's gentian.

The eastern portion of the expansion, in the area surrounding Surveyor Mountain, is home to high desert species such as bitterbrush and sagebrush, along with late successional dry coniferous forests containing lodgepole pine, dry currant, and western white pine.

The Horseshoe Ranch Wildlife Area in Siskiyou County, California, offers particularly significant ecological connectivity and integrity. The area contains a broad meadow ecosystem punctuated by Oregon white oak and western juniper woodlands alongside high desert species such as gray rabbitbrush and antelope bitterbrush. The area is also home to the scarlet fritillary, Greene's mariposa lily, Bellinger's meadowfoam, and California's only population of the endangered Gentner's fritillary.

The incredible biodiversity of plant communities in the expansion is mirrored by equally stunning animal diversity, supported by the wide variety of intact habitats and undisturbed corridors allowing animal migration and movement. Perhaps most notably, the Cascade-Siskiyou landscape, including the Upper Jenny Creek Watershed and the Southern Cascades, provides vitally important habitat connectivity for the threatened northern spotted owl. Other raptors, including the bald eagle, golden eagle, white-tailed kite, peregrine falcon, merlin, great gray owl, sharp-shinned hawk, Cooper's hawk, osprey, American kestrel, northern goshawk, flammulated owl, and prairie falcon, soar above the meadows, mountains, and forests as they seek their prey.

Ornithologists and birdwatchers alike come to the Cascade-Siskiyou landscape for the variety of birds found here. Tricolored blackbird, grasshopper sparrow, bufflehead, black swift, Lewis's woodpecker, purple martin, blue grouse, common nighthawk, dusky flycatcher, lazuli bunting, mountain quail, olive-sided flycatcher, Pacific-slope flycatcher, pileated woodpecker, ruffed grouse, rufous hummingbird, varied thrush, Vaux's swift, western meadowlark, western tanager, white-headed woodpecker, and Wilson's warbler are among the many species of terrestrial birds that make their homes in the expansion area. The Oregon vesper sparrow, among the most imperiled bird species in the region, has been documented in the meadows of the upper Jenny Creek Watershed.

Shore and marsh birds, including the Tule goose, yellow rail, snowy egret, harlequin duck, Franklin's gull, red-necked grebe, sandhill crane, pintail, common goldeneye, bufflehead, greater yellowlegs, and least sandpiper, also inhabit the expansion area's lakes, ponds, and streams.

Diverse species of mammals, including the black-tailed deer, elk, pygmy rabbit, American pika, and northern flying squirrel, depend upon the extraordinary ecosystems found in the area. Beavers and river otters inhabit the landscape's streams and rivers, while Horseshoe Ranch Wildlife Area has been identified as a critical big game winter range. Bat species including the pallid bat, Townsend's big-eared bat, and fringed myotis hunt insects beginning at dusk. The expansion area encompasses known habitat for endangered gray wolves, including a portion of the area of known activity for the Keno wolves. Other carnivores such as the Pacific fisher, cougar, American badger, black bear, coyote, and American marten can be seen and studied in the expansion area.

The landscape also contains many hydrologic features that capture the interest of visitors. Rivers and streams cascade through the mountains, and waterfalls such as Jenny Creek Falls provide aquatic habitat along with scenic beauty. The upper headwaters of the Jenny Creek watershed are vital to the ecological integrity of the watershed as a whole, creating clear cold water that provides essential habitat for fish living at the margin of their environmental tolerances. Fens and wetlands, along with riparian wetlands and wet montane meadows, can be found in the eastern portion of the expansion area. Lost Lake, in the northernmost portion of the expansion area, contains a large lake that serves as Western pond turtle habitat, along with another upstream waterfall.

The expansion area includes habitat for populations of the endemic Jenny Creek sucker and Jenny Creek redband trout, as well as habitat for the Klamath largescale sucker, the endangered shortnose sucker, and the endangered Lost River sucker. The watershed also contains potential habitat for

the threatened coho salmon. Numerous species of aquatic plants grow in the area's streams, lakes, and ponds.

Amphibians such as black salamander, Pacific giant salamander, foothill yellow-legged frog, Cascade frog, the threatened Oregon spotted frog, and the endemic Siskiyou Mountains salamander thrive here thanks to the connectivity between terrestrial and aquatic habitats. Reptiles found in the expansion area include the western pond turtle, northern alligator lizard, desert striped whipsnake, and northern Pacific rattlesnake.

The Cascade-Siskiyou landscape's remarkable biodiversity includes the astounding diversity of invertebrates found in the expansion, including freshwater mollusks like the Oregon shoulderband, travelling sideband, modoc rim sideband, Klamath taildropper, chase sideband, Fall Creek pebblesnail, Keene Creek pebblesnail, and Siskiyou hesperian. The area has been identified by evolutionary biologists as a center of endemism and diversity for springsnails, and researchers have discovered four new species of mygalomorph spiders in the expansion. Pollinators such as Franklin's bumblebee, western bumblebee, and butterflies including Johnson's hairstreak, gray blue butterfly, mardon skipper, and Oregon branded skipper are critical to the ecosystems' success. Other insects found here include the Siskiyou short-horned grasshopper and numerous species of caddisfly.

The Cascade-Siskiyou landscape has long been a focus for scientific studies of ecology, evolutionary biology, wildlife biology, entomology, and botany. The expansion area provides an invaluable resource to scientists and conservationists wishing to research and sustain the functioning of the landscape's ecosystems into the future.

The expansion area includes numerous objects of scientific or historic interest. This enlargement of the Cascade-Siskiyou National Monument will maintain its diverse array of natural and scientific resources and preserve its cultural and historic legacy, ensuring that the scientific and historic values of this area remain for the benefit of all Americans.

WHEREAS, section 320301 of title 54, United States Code (known as the "Antiquities Act"), authorizes the President, in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Federal Government to be national monuments, and to reserve as a part thereof parcels of land, the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected;

WHEREAS, it is in the public interest to preserve the objects of scientific and historic interest on these public lands as an enlargement of the boundary of the Cascade-Siskiyou National Monument;

NOW, THEREFORE, I, BARACK OBAMA, President of the United States of America, by the authority vested in me by section 320301 of title 54, United States Code, hereby proclaim the objects identified above that are situated upon lands and interests in lands owned or controlled by the Federal Government to be part of the Cascade Siskiyou National Monument and, for the purpose of protecting those objects, reserve as part thereof all lands and interests in lands owned or controlled by the Federal Government within the boundaries described on the accompanying map, which is attached hereto and forms a part of this proclamation. These reserved Federal lands and interests in lands encompass approximately 48,000 acres. The boundaries described on the accompanying map are confined to the smallest area compatible with the proper care and management of the objects to be protected.

Nothing in this proclamation shall change the management of the areas protected under Proclamation 7318. Terms used in this proclamation shall have the same meaning as those defined in Proclamation 7318.

All Federal lands and interests in lands within the boundaries described on the accompanying map are hereby appropriated and withdrawn from

all forms of entry, location, selection, sale, or other disposition under the public land laws, from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the monument.

The enlargement of the boundary is subject to valid existing rights. If the Federal Government subsequently acquires any lands or interests in lands not owned or controlled by the Federal Government within the boundaries described on the accompanying map, such lands and interests in lands shall be reserved as a part of the monument, and objects identified above that are situated upon those lands and interests in lands shall be part of the monument, upon acquisition of ownership or control by the Federal Government.

The Secretary of the Interior (Secretary) shall manage the area being added to the monument through the Bureau of Land Management as a unit of the National Landscape Conservation System, under the same laws and regulations that apply to the rest of the monument, except that the Secretary may issue a travel management plan that authorizes snowmobile and non-motorized mechanized use off of roads in the area being added by this proclamation, so long as such use is consistent with the care and management of the objects identified above.

Nothing in this proclamation shall preclude low-level overflights of military aircraft, the designation of new units of special use airspace, or the use or establishment of military flight training routes over the lands reserved by this proclamation consistent with the care and management of the objects identified above.

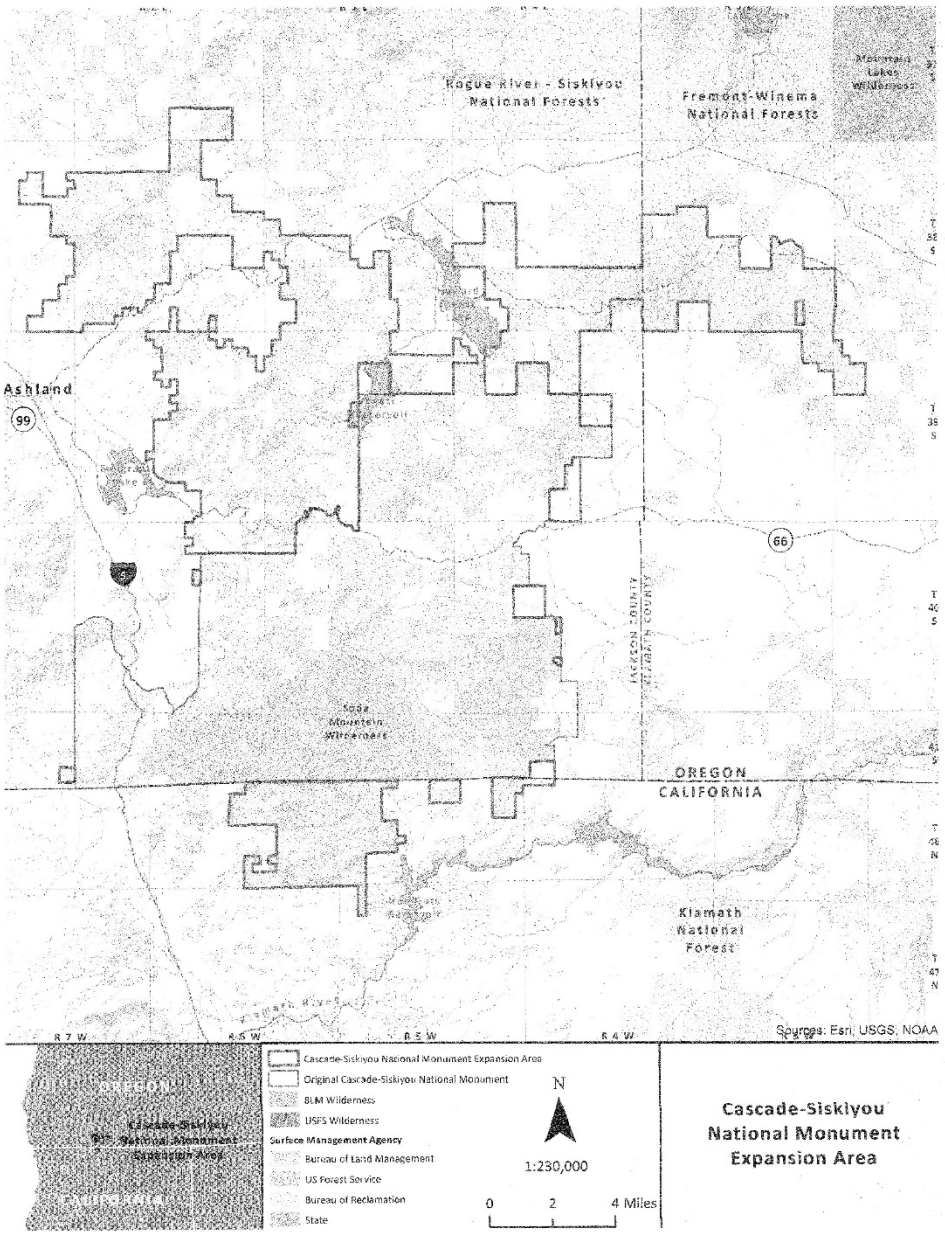
Nothing in this proclamation shall be deemed to enlarge or diminish the jurisdiction of the State of Oregon or the State of California with respect to fish and wildlife management.

Nothing in this proclamation shall be deemed to revoke any existing withdrawal, reservation, or appropriation; however, the monument shall be the dominant reservation.

Warning is hereby given to all unauthorized persons not to appropriate, injure, destroy, or remove any feature of this monument and not to locate or settle upon any of the lands thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this twelfth day of January, in the year of our Lord two thousand seventeen, and of the Independence of the United States of America the two hundred and forty-first.

Billing code 3295–F7–P



[FR Doc. 2017–01332

Filed 1–17–17; 11:15 a.m.]

Billing code 4310–10–C

APPENDIX B. CSNM OBJECTS OF SCIENTIFIC AND HISTORIC INTEREST

Presidential Proclamations 7318 and 9564 identified the following objects of scientific and historic interest to protect in the Cascade-Siskiyou National Monument:

- A landscape of ecological wonder with unmatched biological diversity that provides habitat connectivity, watershed protection, and landscape-scale resilience for the area's critically important natural resources.

- Extraordinarily varied and diverse plant communities, including special plant communities, and the diverse, rare, and endemic wildlife and plant species that populate them.

- Intact habitats and undisturbed corridors that allow for animal migration and movement, including old-growth forest habitat, which is crucial to the northern spotted owl and numerous other bird species, and aquatic habitat that includes fens, riparian wetlands, and montane meadows.

- Geological features and landscapes which include: the tectonic actions and convergence that created the land bridge between the Klamath, Siskiyou, and Cascade mountain ranges, expressed by the Siskiyou Summit Fault; diverse volcanic lithologies and soils; Pilot Rock, a remnant of a volcanic plug; Grizzly Peak, a large stratovolcano that features lava flows, spatter cones, and older tuffs; Old Baldy, a shield volcano that features a series of dikes; and Surveyor Mountain, which represents the far western boundary of the Basin and Range Province.

- Historic and prehistoric human use sites including Native American and Euro-American settler travel routes, including the Applegate Trail; traces of the presence and occupancy of early ranchers, loggers, and homesteaders; and a historic ranch in the Horseshoe Ranch Wildlife Area.

- Opportunities for scientific and historic studies and an invaluable resource to scientists and conservationists wishing to research and sustain the functioning of the landscape's ecosystems into the future.

APPENDIX C. WILDLIFE SPECIES OF THE CSNM

Species Listed Under the Endangered Species Act (ESA)						
Analytical Group	**Taxonomic Group**	**Common name**	**Scientific name**	**Listing Status**	**Presence status**	**Habitat Association**
Late Closed	Birds	Northern Spotted Owl	*Strix occidentalis caurina*	Threatened	Documented	Late successional/Old Growth Conifer Forest
Riparian	Amphibians	Oregon Spotted Frog	*Rana pretiosa*	Threatened	Documented	Lentic habitat
Generalist	Mammals	Gray Wolf	*Canis lupus*	Endangered	Documented	Broad range of habitat types: forest area for cover, open grasslands etc. for hunting
Meadows	Invertebrates	Franklin's Bumble Bee	*Bombus franklini*	Endangered	Documented	Meadows with floral resources and nesting habitat (e.g., rodent burrows, etc.)
Bureau Sensitive Species						
Analytical Group	**Taxonomic Group**	**Common name**	**Scientific name**	**Listing Status**	**Presence status**	**Habitat Association**
Riparian	Reptiles	Western pond turtle	*Actinemys marmorata*	SEN	Documented	Lentic and lotic habitats. Surrounding uplands for oviposition and hibernation/estivation.
Riparian / Early	Birds	Tricolored blackbird	*Agelaius tricolor*	OR-SEN	Suspected	Riparian areas and upland shrubs
Meadows	Birds	Grasshopper sparrow	*Ammodramus savannarum*	OR-SEN	Suspected	Open grassland
Oak woodland	Amphibians	Black salamander	*Aneides flavipunctatus*	OR-SEN	Suspected	Talus, oak/Douglas fir open habitat, rocky ravines
Riparian / Early /	Bats	Pallid bat	*Antrozous pallidus*	OR-SEN	Documented	Dry, semi-arid habitats. Rock crevices, hollow trees, etc.
Meadows	Invertebrates	Western bumble bee	*Bombus occidentalis*	SEN	Documented	Meadows with abundant floral resources
Conifer forest	Invertebrates	Johnson's hairstreak	*Callophrys johnsoni*	SEN	Documented	Conifers with mistletoe
Meadows	Invertebrates	Siskiyou short-horned grasshopper	*Chloealtis aspasma*	OR-SEN	Documented	Meadows, esp. with elderberry
Mines / Snags / Open areas for foraging	Bats	Townsend's big-eared bat	*Corynorhinus townsendii*	OR-SEN	Documented	Require dark refugia, water sources, foraging areas
Meadows	Invertebrates	Monarch butterfly	*Danaus plexippus*	OR-SEN	Documented	Native milkweed spp.

Riparian	Birds	Bald eagle	*Haliaeetus leucocephalus*	SEN	Documented	Large trees for nest siting; riparian areas for hunting
Talus	Mollusks	Oregon shoulderband	*Helminthoglypta hertleini*	OR-SEN	Documented	Rocky substrate with interstitial spaces
Meadows	Invertebrates	Oregon branded skipper	*Hesperia colorado oregonia*	OR-SEN	Documented	
Pine/Oak woodland	Birds	Lewis's woodpecker	*Melanerpes lewis*	SEN	Documented	Oak, Ponderosa pine, and riparian cottonwood
Forest / Snags	Bats	Fringed myotis	*Myotis thysanodes*	OR-SEN	Documented	Generalist—crevices in trees, buildings, mines; broad dietary range
Conifer forest and Oak woodland	Carnivores	Fisher	*Pekania pennanti*	SEN	Documented	Habitat features: cavities in trees, hollow logs, large limbs and platforms for resting; log piles as hiding cover
Riparian / Lake	Birds	American white pelican	*Pelecanus erythrorhynchos*	SEN	Suspected	Islands or similarly protected sites for nesting.
White fir / Red fir forest	Birds	White-headed woodpecker	*Picoides albolarvatus*	SEN	Documented	Large diameter Ponderosa pine
Meadows	Invertebrates	Gray-blue butterfly	*Plebejus podarce klamathensis*	OR-SEN	Documented	
Meadows	Invertebrates	Mardon skipper	*Polites mardon*	SEN	Documented	Short grass meadows. Oviposit on several sp. including *Danthonia*
Meadows	Birds	Oregon vesper sparrow	*Pooecetes gramineus affinis*	OR-SEN	Documented	Grass dominated understory with elevated perches for singing
Riparian	Mollusks	Crater Lake tightcoil	*Pristiloma crateris*	OR-SEN	Suspected	
Snags / near water bodies	Birds	Purple martin	*Progne subis*	OR-SEN	Suspected	Prefer to nest near water. Forage high over open areas.
Riparian	Amphibians	Foothill yellow-legged frog	*Rana boylii*	OR-SEN	Documented	
Meadows	Invertebrates	Coronis fritillary	*Speyeria coronis coronis*	OR-SEN	Documented	
Conifer or Oak woodland	Mollusks	Dalles hesperian	*Vespericola depressus*	SEN	Documented	
Conifer or Oak woodland	Mollusks	Siskiyou hesperian	*Vespericola sierranus*	OR-SEN	Documented	

APPENDIX D. MAPS

Map #	Map Name	Section
Map 1-1.	Cascade-Siskiyou National Monument - Plan and Administrative Boundaries	Section 1
Map 2-1.	Cascade-Siskiyou National Monument - Boundary Changes and Other Designations	Section 2.1
Map 2-2.	Cascade-Siskiyou National Monument - Planning Area	Section 2.2
Map 6-1.	Cascade-Siskiyou National Monument - Abandoned Mine Lands	Section 6.1.1
Map 6-2.	Cascade-Siskiyou National Monument - Existing Designations	Section 6.2.1
Map 6-3.	Cascade-Siskiyou National Monument - Aquatic Resources	Section 6.5
Map 6-4.	Cascade-Siskiyou National Monument - Grazing Allotments	Section 6.10.1
Map 6-5.	Cascade-Siskiyou National Monument - Rock Quarries	Section 6.11.1
Map 6-6.	Cascade-Siskiyou National Monument - Noxious Weeds Identification	Section 6.14.1
Map 6-7.	Cascade-Siskiyou National Monument - Transportation Network	Section 6.21.1
Map 6-8.	Cascade-Siskiyou National Monument - General Vegetation Types	Section 6.22.1
Map 6-9.	Cascade-Siskiyou National Monument - Historical Fire Perimeters	Section 6.28.1
Map 6-10.	Cascade-Siskiyou National Monument - Wildfire Risk	Section 6.28.1