Salmon-Challis National Forest Fuels Reduction and Restoration Project

Environmental Assessment, Finding of No Significant Impact, and Draft Decision Notice

Salmon-Challis National Forest  February 2022
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<th>Full Term</th>
</tr>
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<tbody>
<tr>
<td>CAA</td>
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</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
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<tr>
<td>EO</td>
<td>executive order</td>
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<tr>
<td>ESA</td>
<td>Endangered Species Act</td>
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<td>FSM</td>
<td>Forest Service Manual</td>
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<tr>
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<td>inventoried roadless area</td>
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<td>Land and Resource Management Plan</td>
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<td>National Environmental Policy Act</td>
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<td>National Historic Preservation Act</td>
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<td>National Oceanic and Atmosphere Administration</td>
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<tr>
<td>RHCA</td>
<td>Riparian Habitat Conservation Area</td>
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<td>Salmon-Challis NF</td>
<td>Salmon-Challis National Forest</td>
</tr>
<tr>
<td>WSR</td>
<td>Wild and Scenic River</td>
</tr>
</tbody>
</table>
Themes from Feedback We Received

Numerous discussions with internal and external parties led to a number of changes and additions to this project which have taken place since it was initially released for public review during scoping. Feedback and comments we received centered around a few common themes. It is important to understand that there are some key considerations of this project which will enable the Salmon-Challis National Forest (NF) to be more targeted in our ability to implement fuels reduction projects and ultimately accomplish more work on the ground.

Landscape Scale Approach

Concern about the scale of the project was a common theme we heard from various stakeholders and members of the public. We have designed this project to be more targeted in our planning and implementation of restoration projects which use hand thinning and prescribed fire. This will enable Forest Service staff to be more responsive to partners, funding sources, and public input. It also gives us the ability to adjust where we are putting treatments on the landscape year to year based on changing conditions, such as in the case of a wildfire occurring.

This approach is driven by the very real need to increase the pace and scale of fuels reduction and restoration treatments. Not only has the Forest Service had many recent changes in policy and national directives to take a hard look at how we can make a difference in addressing the wildfire problem, but this is also a very real concern shared by many citizens both in our local communities and across the western US. Our analysis shows that at our current rate, the backlogged need for restoration treatments on the Salmon-Challis NF will continue to increase with little chance that we will be able to make a dent in them.

This project was designed to show what is needed to address the wildfire problem, which is landscape in scale, and therefore requires a holistic approach. We also recognized the need to gain some efficiencies in our National Environmental Policy Act (NEPA) process so that staff could spend more time implementing the treatments. First, we completed a landscape scale analysis which shows us where treatments are needed to either restore or maintain our ecosystems (Appendix A and Appendix C). Using this as our baseline, the project then defines the actions and sideboards that need to be in place upfront before individual units are identified for further analysis. This approach is not very different than in previous projects. The only difference is that the unit boundaries are not identified in the NEPA decision. This is because we recognize that in practice, even when the units are defined ahead of time, they still then need to be prioritized each year in order to balance the work we can accomplish with available funding and staffing.

This project gives us a better ability to implement project activities at the right place and time. This is especially relevant in the case of wildfires which occur every summer in random locations across the Salmon-Challis NF. We have had numerous projects which have burned in a wildfire prior to us being able to complete the work in that area, and so had to be revised or canceled altogether. This project already accounts for the range of ecosystem conditions that are needed. This gives us a baseline to compare the effects of wildfires against, and ultimately allows us to more easily assess where treatments are needed next.

Level of Analysis

There were also specific concerns that the level of analysis completed for a Categorical Exclusion (CE) project would not be sufficient. One significant change for this project was to convert the level of NEPA review and analysis from a CE to an EA. In addition, we have added Appendices A and B, which each provide a detailed description of the multiple analyses developed for this project. These spatially defined or mapped analyses are called the Wildfire Protection Zone (Appendix A) and Vegetation Condition Class datasets (Appendix B).

The Wildfire Protection Zone takes into account private property and other values at risk. We would prioritize treatments in those areas first to protect public health and safety. The second dataset used to guide where treatments occur is the Vegetation Condition Class dataset. It shows where in the project area forested and non-forested systems depart from historical conditions. This means that without restoration treatments, these areas
are at risk for further loss of ecosystem function and resiliency. This dataset and analysis were then taken several steps further to produce Appendix C, which describes in detail the different vegetation types, Historic Fire Regimes (and their Historic Range of Variability), and existing stand conditions within the project area. Appendix C uses that information to outline the different types of treatments that would apply based on the conditions within each stand or unit being treated.

In addition to these, we also added analysis that shows the potential for significant losses due to uncharacteristic wildfires if no action is taken (See Consideration of No Action section). And we completed a review of 30 previous projects containing similar prescribed fire and hand thinning treatments as proposed in this project found no significant impacts for the resources included in this environmental assessment. For more details see the Analysis Framework document on the project website (https://www.fs.usda.gov/project/?project=58813).

**Project Checks and Balances**

We also heard concerns about the project seeming too 'open-ended'; various parties felt they needed more assurances that natural resources were protected, social considerations were taken into account, and finer scale conditions on the ground were taken into account.

There are numerous aspects of this project and of our larger processes which constraint project activities and ensure all of those are taken into consideration prior to implementation. First the Project Design Features described in the EA (Table 2) describe each sideboard or consideration that must be followed. In addition to that, all units developed for implementation will first have to go through each step listed under the Coordination Prior to Project Activities section in this EA. These include site-specific data collection and surveys and any additional analysis required by Project Design Features and existing laws and regulations. Additionally, Appendices A and C define how treatments will be designed to ensure we are maintaining ecosystem function and ecological integrity.

There are also many laws, policies, procedures, and other factors. One example of these is the policy which requires us to develop a prescribed fire plan for any units planned for prescribed fire treatments. Called the Interagency Guide to Prescribed Fire (NWCG 2017), this is a detailed analysis of natural resource and social considerations which ensures all proper precautions are taken into account before any prescribed fire is ignited. Other factors which constrain project implementation include current and foreseeable staffing, funding, unpredictable weather or seasonal constraints, smoke restrictions, and many others.

Another example of this is the ESA consultation process. Over the past six months, Forest Service biologists worked with the National Marine Fisheries Service and the US Fish and Wildlife Service to develop detailed Project Design Features related to streamside buffers and limiting treatments within riparian areas, and added monitoring protocols and a detailed literature review in response to concerns about protecting fish, streamside habitat, watershed health and water quality (Table 2). These protocols ensure that implementation of this project will be done in a way that integrates short- and long-term benefits.

See also the Vegetation Projects Frequently Asked Questions document on the project website (https://www.fs.usda.gov/project/?project=58813) and the Story Map for this project which outline key concepts of the project’s design.

**How this project will complement our ability to harvest timber products**

We also considered feedback and concerns about how this project will complement the important goal of providing timber products for harvest. In response, Project Design Feature Fuels-04 requires staff to determine whether commercial timber harvest would be a feasible option before using prescribed burning and non-commercial hand treatments (Table 2). If they consider timber harvest to be viable and desirable, this would be planned under a separate NEPA analysis. This project will also protect future timber stands by reducing the overall risk of severe and large scale wildfires.
Relationship of this project with other projects

In response to feedback we heard about overlapping project boundaries, we absorbed the North Zone Vegetation Improvement Project proposal (scoped concurrently as a CE) into this project. After reviewing the treatments proposed in that project, we determined that those could be accomplished under this proposed project. The one exception was the mechanical treatments proposed under North Zone Vegetation Improvement Project, a feature which prompted concerns from multiple parties. Vegetation thinning and fire line construction in the area previously considered in North Zone Vegetation Improvement Project will now only be done with hand tools. No mechanical treatments are being proposed with this project. We also revised the project area boundaries to fully exclude the Stormy and Bayhorse Project areas. See the online map for more details: [http://bit.ly/VegWebApp](http://bit.ly/VegWebApp).
Purpose and Need

Today many forested stands on the Salmon-Challis NF are departed from historical conditions, with reduced ecological integrity (Keane et al. 2009; Mclauchlan et al. 2020; LANDFIRE 2019). Restoring the role of fire in ecosystems that are adapted to historical fire occurrence is identified in the National Cohesive Wildland Fire Management Strategy and similar national directives as a key to improving ecosystem resiliency (NSC 2016). The purpose of this project is to improve ecosystem resiliency on the Salmon-Challis NF by reducing fuels buildup, restoring forest structure and composition, improving wildlife habitat conditions, and promoting aspen (Populus tremuloides) and whitebark pine (Pinus albicaulis) species.

Currently many forested stands are densely populated with smaller tree species and are more homogenous, and therefore lack the diversity and complexity historically found on the Salmon-Challis NF. Prior to the 1900’s, regularly occurring cycles of fire removed smaller trees, created forest openings, and limited conifer encroachment, which resulted in a mosaic of different successional stages throughout the landscape. This maintained vegetation diversity and ecosystem function. In recent decades, fire suppression and a lack of active management to keep pace with the trend away from historical conditions have resulted in vegetation ecosystems with lower resilience and ecological integrity. Existing conditions have also intensified trends in insect and pathogen outbreaks, drought-related tree mortality, and conifers encroaching into non-forested habitats. Dense vegetation conditions have increased the likelihood of larger fires which burn with higher severity than the system historically evolved with which in turn puts forest stands and wildlife habitats on the Salmon-Challis NF at greater risk for loss and degradation (Graham et al. 2004).

Historically, fire shaped the composition, structure, and function of many ecosystems within the Salmon-Challis NF’s management boundaries (Keane et al. 2009; Mclauchlan et al. 2020; LANDFIRE 2019). From 1900 to
2016, an average of approximately 10,000 acres burned in a wildfire each year outside of designated wilderness (Forest Service 2022). This is far less than the average of 77,000 acres estimated to have burned annually in preceding centuries (LANDFIRE 2019).

Previous fire and vegetation treatments have not adequately addressed the difference in fire frequency, severity, and size (NSC 2016; Barbero et al. 2015; Halofsky et al. 2018a and 2018b). From 2008 to 2018, the Salmon-Challis NF treated an average of 3,917 acres annually with prescribed fire; from 1960 to 2018, the Salmon-Challis NF treated an average of 2,673 acres annually with thinning, timber harvest, and timber salvage treatments. This pace and scale of prescribed fire and hand treatments of vegetation is therefore not sufficient to maintain ecosystem health or to mitigate wildfire hazard. This project is needed to address the many areas which evolved with fire and are now in need of restoration and maintenance on the Salmon-Challis NF.

**Project Location**

The project area is approximately 2,735,600 acres in portions of the Challis-Yankee Fork, Leadore, Lost River, Middle Fork, North Fork, and Salmon-Cobalt Ranger Districts on the Salmon-Challis NF in central Idaho (Map 1). The project area does not include designated wilderness and current or proposed vegetation treatment projects (see the Relationship of this project with other projects section).

**Proposed Action**

The Forest Service proposes to authorize prescribed burning and hand treatments of vegetation on acres in need of restoration or maintenance outside of designated wilderness and in areas not currently being treated under a defined project area (Map 1). Project activities would include prescribed burning, hand line construction, and vegetation treatments using chainsaws and hand tools. No commercial timber harvest, road construction, or road reconstruction is being proposed. The number of acres treated annually would depend on a variety of factors, including funding, weather conditions, resource protection measures, and resources available to accomplish treatments.

Currently the number of acres treated annually with wildfire, timber harvest, prescribed fire, and/or vegetation treatments such as thinning are only twenty two percent of what historically was treated with regularly occurring fire (LANDFIRE 2019; Forest Service 2022). It is anticipated that this project would treat up to 8,000 acres with prescribed fire and 2,000 acres with hand treatments, annually. This would increase the percent of annual acres treated to forty two percent of what is needed to improve ecological function and resiliency.

The specific locations for prescribed fire and vegetation treatment units will be defined based on what is described in the Conditions and Prioritization of Project Activities section below. This proposed action does not apply to any congressionally designated wilderness areas, as outlined in Map 1. Prescribed fire and vegetation treatments using hand tools and chainsaws are proposed to be used in inventoried roadless areas in accordance with parameters set forth in the 2008 Idaho Roadless Rule (Forest Service 2008). All project activities will follow direction set forth in the Project Design Features listed in Table 2 below.

**Prescribed Fire Application**

The type and amount of prescribed fire applied would depend on the vegetation type, objectives, and existing fuel or stand conditions. See Appendix C for a description of the current or baseline conditions, desired conditions after treatment, and treatment type recommended for the 16 vegetation communities listed in Table 1. Prescribed fire objectives, resource considerations, and weather parameters for ignitions would be defined in the prescribed fire plan. Site specific surveys would be done as needed to inform the silvicultural prescription, which guides actions needed for treatment. Several entries, such as hand thinning, piling, pile burning and more than one application of prescribed fire may be needed to restore vegetation conditions to meet the project’s purpose and need.

Prescribed burning would involve removing vegetation over a designated burn unit. Such burning is done under a prescription, which identifies the parameters for how fire will be applied to meet the purpose, need, and
conditions of this project. Each burn unit/area would be implemented in adherence with Agency policy and
direction, following the Interagency Prescribed Fire Planning and Implementation Procedures Guide (PMS-484)
(NWCG 2017) which establishes national interagency standards. Prescribed burning treatment units may be
accessed on any road or trail authorized for administrative use on the Salmon-Challis NF. Any unauthorized roads
used administratively for this project would be considered temporary while in use then would be rehabilitated
following project activities.

To the extent feasible, existing firebreaks, such as roads, trails, or wet drainages, would be used to support
prescribed burn treatments. Where existing firebreaks are not sufficient to meet prescribed fire control objectives,
fire lines would be constructed. The extent of fire lines constructed would vary, depending on the size of the burn
area and site-specific conditions. Fire line construction may include removing vegetation using hand tools and
chainsaws, pruning, and clearing all vegetation down to mineral soil\(^1\). Fire lines would be rehabilitated following
project activities.

Prescribed fire treatments would be implemented year-round when weather and air quality conditions allow the
Forest Service to meet the objectives and desired conditions for burning. Examples of the methods used to apply
fire on the landscape include ground, vehicle-based, and aerial applications of fire. Fires would be started using
handheld drip-torches, spherical ignition devices applied via aircraft or helicopter, fusees,\(^2\) flares or fire launchers,
or propane torches.

All project activities would be consistent with the Salmon National Forest and Challis National Forest land and
resource management plans and amendments (Forest Service 1987, 1988) and any relevant laws and regulations.

**Hand Treatment**

Hand treatment of vegetation would include thinning, piling, lopping and scattering, pruning, and girdling. These
treatments may be done as a stand-alone activity, or several treatments may be used in a progressive manner. For
example, hand treatment would be used prior to prescribed fire treatments in order to meet fire control and
restoration objectives. See Appendix C for detailed descriptions of the types of treatments that are needed in each
vegetation type identified.

**Conditions and Prioritization of Project Activities**

For this project, the Salmon-Challis NF would prioritize the following:

- Areas in the wildfire protection zone
- Degree of departure from historical conditions, using vegetation condition class, with the highest
departures given greater priority
- The ability to implement the project, based on such factors as capacity, funding, complexity, and site
conditions

The wildfire protection zone shows where there is a high likelihood for wildfire impacts on infrastructure, private
property, and other identified social and economic values on or near the Salmon-Challis NF. It is based on the
potential for wildfire occurrence, expected fire behavior, and the ability of suppression resources to control a
wildfire. Appendix A details how the wildfire protection zone polygons were developed for the Salmon-Challis NF.
In the project area, approximately 1,100,000 acres are in the wildfire protection zone (Map 2).

\(^1\) Any soil consisting primarily of mineral (sand, silt and clay) material, rather than organic matter.

\(^2\) A large-headed match capable of staying lit in strong wind.
The vegetation condition class dataset spatially defines historical fire regime conditions and the relative departure from those conditions. Fire regimes are based on historical wildfire frequency and severity for the different vegetation communities in the project area, as defined by a synthesis of studies and best available science (LANDFIRE 2019). Relative departure ratings are used to determine the conditions needed to restore or maintain fire adapted ecosystems. The resulting mosaic of vegetation conditions, age classes, and understory structures would reduce natural fuel buildup, improve ecosystem resiliency, and reduce wildfire hazard. Appendix B explains how the vegetation condition class dataset was used to identify acres departed from historic conditions for the vegetation communities listed in Table 1. Approximately 1,722,600 acres (63 percent of the project area) have either a moderate or high departure from historical fire conditions (Table 1 and Map 3).

### Table 1. Acres Departed from Historic Conditions within the Project Area

<table>
<thead>
<tr>
<th>Historic Vegetation Community</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Forested Types</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Upper Subalpine Forest/Whitebark Pine</td>
<td>455,800</td>
<td>5,100</td>
<td>361,600</td>
<td>1,000</td>
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<tr>
<td>Lower Subalpine Forest</td>
<td>378,900</td>
<td>337,100</td>
<td>29,700</td>
<td>300</td>
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<tr>
<td>Douglas-fir Forest</td>
<td>509,300</td>
<td>4,800</td>
<td>482,500</td>
<td>12,300</td>
</tr>
<tr>
<td>Douglas-fir/Ponderosa Pine Forest</td>
<td>275,100</td>
<td>267,100</td>
<td>3,900</td>
<td>500</td>
</tr>
<tr>
<td>Ponderosa Pine Savannah</td>
<td>158,400</td>
<td>700</td>
<td>2,600</td>
<td>154,200</td>
</tr>
<tr>
<td>Aspen</td>
<td>900</td>
<td>0</td>
<td>800</td>
<td>0</td>
</tr>
<tr>
<td><strong>Sagebrush Types</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Mountain Big Sagebrush</td>
<td>366,900</td>
<td>2,100</td>
<td>355,500</td>
<td>1,500</td>
</tr>
<tr>
<td>Wyoming Big Sagebrush</td>
<td>1,600</td>
<td>1,500</td>
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<td>0</td>
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<tr>
<td>Basin Big Sagebrush</td>
<td>152,500</td>
<td>500</td>
<td>143,600</td>
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<td>Dwarf Sagebrush</td>
<td>60,051</td>
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<td>41,700</td>
<td>4,400</td>
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<tr>
<td><strong>Other Types</strong></td>
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<td>Alpine Vegetation Types</td>
<td>4,900</td>
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<td>0</td>
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<td>Curl-leaf Mahogany/Shrub Mix</td>
<td>97,000</td>
<td>300</td>
<td>7,800</td>
<td>81,300</td>
</tr>
<tr>
<td>Deciduous Shrubland</td>
<td>6,500</td>
<td>5,000</td>
<td>500</td>
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<tr>
<td>Grasslands</td>
<td>29,100</td>
<td>11,300</td>
<td>5,900</td>
<td>6,100</td>
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<tr>
<td>Montane/Foothill Riparian</td>
<td>18,900</td>
<td>400</td>
<td>18,100</td>
<td>100</td>
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<tr>
<td>Subalpine/Upper Montane Riparian</td>
<td>70,100</td>
<td>67,700</td>
<td>1,100</td>
<td>-</td>
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<td>Barren–Rock/Sand/Clay</td>
<td>103,900</td>
<td>N/A</td>
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<td>Open Water</td>
<td>3,400</td>
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<td>N/A</td>
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<td>Snow and Ice</td>
<td>7,800</td>
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<td>N/A</td>
<td>N/A</td>
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<td>Sparse Vegetation</td>
<td>47,200</td>
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<td>N/A</td>
<td>N/A</td>
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<tr>
<td><strong>Grand Totals</strong></td>
<td>2,735,600</td>
<td>708,100</td>
<td>1,456,800</td>
<td>265,800</td>
</tr>
</tbody>
</table>

Source: Forest Service GIS 2021

1. Includes those cover types that do not typically burn such as open water, snow-ice, urban areas, and agricultural fields.

### Coordination Prior to Project Activities

The Forest Service’s personnel would coordinate with each other before and during project implementation. This is to ensure that all project work would comply with the standards, guidelines, and other practices applicable at the time of implementation.
Example topics for coordination are as follows:

- Outreach with local publics, tribes, agencies, and organizations
- Treatment timing
- Feasibility of a commercial timber sale in the prescribed burn unit
- Necessity of commercial and noncommercial treatments before prescribed burning
- Treatments in riparian habitat conservation areas (RHCAs; Forest Service 1995)
- Newly acquired information regarding wildlife, fish, botanical species, pollinators, invasive species, prevention techniques, and past infestations
- Appropriate pile sizes for minimizing impacts on soil
- Required protective measures for cultural sites and special management areas
- Design, specifications, and locations of fire control lines
- Location of operational sites, such as camps, helicopter landing sites, staging areas, safety zones, and fueling and servicing sites
- Options for seeding, seed mix selections, and erosion- and sediment-control products
- Strategies for prescribed burning in pollinator foraging habitat
- Mitigations which limit impacts on sensitive plants
- Strategies for minimizing effects of prescribed fire on grasslands, shrublands, or areas with high erosion potential and those with invasive annual grasses
- Selection of water drafting sites
- Silvicultural prescription parameters that meet stand restoration and maintenance objectives, as well as visual quality objectives and research natural area direction contained in the applicable decision notice and establishment records (where applicable).
- Options for minimizing effects of prescribed fire on big game thermal cover in winter range
- Necessity of timing and location adjustments to reduce impacts on range permittees’ allotment operations
- Utilizing the Interagency Prescribed Fire Planning and Implementation Procedures Guide (NWCG 2017)

**Project Design Features by Resource Type**

Table 2 includes the design elements to achieve consistency with the Salmon and Challis Forest Plans and to reduce any potential impacts on resources.
Table 2. Project Design Features

<table>
<thead>
<tr>
<th>Design Element Label</th>
<th>Design Element Description</th>
<th>Plan Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural-1</td>
<td>If unanticipated heritage resources are discovered during project implementation, crews would stop work and notify appropriate Forest Service personnel within 24 hours.</td>
<td>Cultural resources</td>
</tr>
<tr>
<td>Cultural-2</td>
<td>During project activity implementation, crews would avoid adversely impacting sites identified as culturally important and would protect heritage sites identified as eligible for listing on the National Register of Historic Places.</td>
<td>Cultural resources</td>
</tr>
<tr>
<td>Cultural-3</td>
<td>Project leads would ensure that needed heritage inventories and consultation are completed before implementing prescribed fires.</td>
<td>Cultural resources</td>
</tr>
<tr>
<td>Fuels-1</td>
<td>When practical, piles would be located at least 30 feet from any cone-producing whitebark pine (<em>Pinus albicaulis</em>).</td>
<td>Sensitive species</td>
</tr>
<tr>
<td>Fuels-2</td>
<td>Hand piles would be constructed to facilitate burning and reduce impacts on soils, adjacent vegetation, and other resources.</td>
<td>Fuels</td>
</tr>
<tr>
<td>Fuels-3</td>
<td>When practical, mortality from prescribed fire in tree plantations would allow for adequate stocking of trees.</td>
<td>Fuels</td>
</tr>
<tr>
<td>Fuels-4</td>
<td>Staff would determine whether commercial timber harvest would be a viable option before using prescribed burning and non-commercial hand treatments. If they consider timber harvest to be desirable, this would be planned under a separate National Environmental Policy Act process, project, and decision.</td>
<td>Timber</td>
</tr>
<tr>
<td>Fuels-5</td>
<td>Trees in Wildland Recreation Idaho Roadless Area Theme would be cut only to support fire line construction.</td>
<td>Idaho Roadless Areas</td>
</tr>
<tr>
<td>IRA-1</td>
<td>In the Jesse Creek Inventoried Roadless Area, project activities would only take place following the completion of the Salmon Municipal Watershed Restoration Project.</td>
<td>Idaho Roadless Areas</td>
</tr>
<tr>
<td>IRA-2</td>
<td>Cutting activities in the Wildland Restoration Theme would be restricted to those actions associated with fire line construction.</td>
<td>Idaho Roadless Area</td>
</tr>
<tr>
<td>Range-1</td>
<td>Where practical, prescribed fire units would be planned so that they are contained within individual grazing allotment units to allow for coordination of grazing rotations with permittees.</td>
<td>Range allotments</td>
</tr>
<tr>
<td>Range-2</td>
<td>Project leads would give as much notice as possible to permittees and range staff before burning. Range staff would notify permit holders.</td>
<td>Range allotments</td>
</tr>
<tr>
<td>Range-3</td>
<td>Range staff would identify all range improvements inside burn areas and would coordinate with forest staff. This is so that the Forest Service can take proper measures to protect infrastructure, as needed, from prescribed fires.</td>
<td>Range improvement</td>
</tr>
<tr>
<td>Recreation-1</td>
<td>Crews would restore or rehabilitate any trails affected by project activities to their pretreatment condition.</td>
<td>Trails</td>
</tr>
</tbody>
</table>
### Design Element Label | Design Element Description | Plan Component
--- | --- | ---
**Recreation-2** | Staff would place signs in key locations to inform recreationists about project objectives. When practical, crews would not use developed recreation sites, including campgrounds and trailheads, for staging areas. | Recreation

**Recreation-3** | Prior to burning, staff would notify outfitters with permits in the project area as to the location and duration of prescribed burns. | Special use permits

### Research Natural Areas

**RNA-1** | Project activities must conform with the applicable plan for the Research Natural Area and not impair the opportunities for which the Research Natural Area was established. | Research Natural Areas

### Sensitive Plants

**Sensitive Plants-1** | Staff would avoid known sensitive plants when laying out fire containment lines and piling slash from hand treatments. | Sensitive species

### Transportation

**Transportation-1** | Following project implementation, the Salmon-Challis NF would block closed to the public National Forest System roads used for project access, from possible future use. Such treatments as the following may be used: blocking access, scarring, installing water bars, revegetating, seeding, mulching, and replacing a culvert with a rolling ford if it may fail. The intent of these treatments would be to stabilize the road to prevent soil and water resource damage, while considering needs for future administrative and emergency access. | Transportation system

**Transportation-2** | Following project implementation, the Salmon-Challis NF would return temporary roads used for project access to their pre-project condition. Resource concerns would also be treated at this time. In addition to light scarification, such treatments as the following may be used: seeding, mulching, installing water bars, scattering woody debris, and reestablishing natural drainage. The intent of the temporary road treatments following use is to stabilize the roads to prevent soil and water resource damage, while considering needs for authorized firewood gathering, camping, and recreation. | Transportation system

**Transportation-3** | On National Forest System roads with seasonal closures, gates would not be left open during seasonal closure periods. | Transportation system

**Transportation-4** | Where earthen barriers are removed from closed National Forest System roads, the Salmon-Challis NF would use temporary traffic control devices to manage unauthorized traffic. Crews would replace earthen barriers during extended periods of inactivity and at project close. | Transportation system

**Transportation-5** | Crews would not pile slash in or near a drainage structure. | Transportation System

### Soils, Water, and Fisheries

**Soils, Water, and Fisheries-1** | All fire control lines constructed during project activities would be rehabilitated by water barring and pulling in debris and topsoil. | Soil resources and water quality
<table>
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<tr>
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<th>Design Element Description</th>
<th>Plan Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soils, Water, and Fisheries-2</td>
<td>Where practical, implementers would locate operational sites, such as camps, helicopter landing sites, staging areas, safety zones, and fueling and servicing sites, outside of RHCAs, wetlands, and sensitive soil areas. In order to prevent petroleum products from entering the stream channel, staff would place pumps and their fuel containers on an impermeable liner capable of containing 1.5 times the total volume of fuel, oil, or other hazardous liquids. Excluding pumps, staff would refuel equipment outside of RHCAs.</td>
<td>Soil resources and water quality</td>
</tr>
<tr>
<td>Soils, Water, and Fisheries-3</td>
<td>When practical, crews would retain 15 tons of down woody material per acre but would strive to achieve no less than 5 tons per acre.</td>
<td>Soil resources and wildlife habitat</td>
</tr>
<tr>
<td>Soils, Water, and Fisheries-4</td>
<td>Coordination with the Salmon-Challis NF soil scientist would occur prior to implementation of project activities to ensure all necessary best management practices are in place to mitigate undesirable fire effects to sensitive soils and steep slopes. This could include evaluating the level of risk to soils and then varying the ignition patterns, conditions under which ignitions would occur, timing or seasonality of implementation, and/or avoidance of fire establishment in high risk areas.</td>
<td>Soil resources</td>
</tr>
<tr>
<td>Soils, Water, and Fisheries-5</td>
<td>No fire line construction or hand treatment of vegetation, including piling, will take place within one tree length of a stream, with a minimum distance of 30 feet regardless of overstory height. Tree length will be determined based on the average maximum height of the tallest dominant trees for a given site class and measured as slope distance from the stream.</td>
<td>Water quality and riparian habitat</td>
</tr>
<tr>
<td>Soils, Water, and Fisheries-6</td>
<td>No ignitions will take place within one tree length of a stream, unless using ignitions will provide beneficial effects on these habitats and fish. Tree length will be determined based on the average maximum height of the tallest dominant trees for a given site class and measured as slope distance from the stream. Prescribed fires may back into these areas. No aerial ignitions will take place within RHCAs.</td>
<td>Water quality and riparian habitat</td>
</tr>
<tr>
<td>Soils, Water, and Fisheries-7</td>
<td>Within RHCAs, prescribed fires would only be ignited if it is consistent with standards in the Pacific anadromous and inland native fish strategies, more commonly referred to as PACFISH and INFISH.</td>
<td>Water quality and riparian habitat</td>
</tr>
<tr>
<td>Soils, Water, and Fisheries-8</td>
<td>Drafting would not remove more than 25 percent of the stream flow to reduce the possibility of stranding fish. These drafting sites would be in streams so as not to disturb spawning fish and their redds. Work would not physically block fish migration or reduce stream flows to the point of preventing fish migration. The intake hose would be equipped with a fish screen, and velocities at the screen would be maintained in accordance with National Oceanic and Atmospheric Administration criteria.</td>
<td>Water quality and riparian habitat</td>
</tr>
</tbody>
</table>

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3 A hollow in a riverbed made by trout or salmon to spawn in.
<table>
<thead>
<tr>
<th>Design Element Label</th>
<th>Design Element Description</th>
<th>Plan Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soils, Water, and Fisheries-9</td>
<td>Staff would design practices that minimize fire effects on vegetation that is stabilizing the edges of natural springs, wetlands, ponds, and streambanks.</td>
<td>Water quality and riparian habitat</td>
</tr>
<tr>
<td>Soils, Water, and Fisheries-10</td>
<td>Treatments in municipal watersheds may be adjusted to help manage the watershed for high-quality water through timing and intensity (e.g., lower-intensity fire or spring burns).</td>
<td>Municipal watersheds</td>
</tr>
<tr>
<td>WSR-1</td>
<td>In order to protect eligible and designated wild and scenic rivers, their outstandingly remarkable values, and the rivers’ classification, projects will mimic naturally occurring disturbance activities within their corridors. Following project implementation, activities to protect and enhance values (e.g., fire line rehabilitation) will occur, if necessary.</td>
<td>Wild and scenic rivers</td>
</tr>
</tbody>
</table>
| Wildlife-1 | If active boreal owl, flammulated owl, great gray owl, or goshawk nest sites are identified in the burn area, continuous disturbance likely to result in nest abandonment would not be permitted at appropriate distances from nest sites for the following seasons:  
• For active boreal owl, flammulated owl, and great grey owl nest sites: April 15 through July 15  
• For active goshawk nest sites: March 15 through August 30 | Sensitive species |
| Wildlife-2 | Crews would strive to meet recommended prescribed fire plan objectives for old growth stands on lands subject to the Salmon Forest Plan, as follows:  
• Maintaining appropriate large diameter lodgepole pine, spruce, whitebark pine, ponderosa pine, and Douglas-fir, as defined by diameter-at-breast-height classes in Hamilton 1993  
• Maintaining and creating decadent components of existing stands, such as log debris, snags, and understory  
• Utilize such treatments as ladder and tree-well fuel reduction for each old growth unit, if needed, prior to prescribed burning | Old growth forest |
| Wildlife-3 | Patches of mountain mahogany would be identified when planning a prescribed burn. Crews would avoid prescribed fire in distinctly identifiable patches of mountain mahogany, where practical, and would avoid ignition and placement of fuel piles in mahogany stands. Where mahogany stands are small inclusions in a larger vegetation type, project leads would emphasize mosaic burn patterns and would minimize high-intensity fire. | Wildlife habitat |
| Wildlife-4 | Crews would design prescribed fire plans that maintain big game habitat features at levels that support populations. | Wildlife habitat |
| Wildlife-5 | Prior to implementing project activities within an implementation unit, project leads would coordinate with Forest Service biologists to establish necessary mitigation for plant or wildlife populations, critical habitat, and/or other sensitive habitats, such as nest sites, burrows, and denning areas. | Sensitive species |
### Design Element

<table>
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<tr>
<th>Label</th>
<th>Design Element Description</th>
<th>Plan Component</th>
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</thead>
<tbody>
<tr>
<td><strong>Visual Resources</strong></td>
<td>Project leads would assign personnel who are knowledgeable in the Continental Divide National Scenic Trail best practices and scenic requirements to collaborate with fuels personnel during project implementation so that these can be utilized, where applicable.</td>
<td>Visual resources</td>
</tr>
<tr>
<td><strong>Whitebark Pine</strong></td>
<td><strong>Whitebark Pine-1</strong> While conducting thinning activities include language in prescriptions and contracts prohibiting removal of any five needle pines. (Confusion between limber and whitebark pine at immature stage)</td>
<td>Proposed species</td>
</tr>
<tr>
<td></td>
<td><strong>Whitebark Pine-2</strong> If whitebark pine is determined to be the dominant species and the site can be reasonably accessed, protect mature seed-producing trees by radial hand thinning at least the height of the tree away, piling generated fell material, or pull back existing down woody or dead material greater than one inch in diameter at least half a tree height. This action would occur before any prescribed fire.</td>
<td>Proposed species</td>
</tr>
<tr>
<td></td>
<td><strong>Whitebark Pine-3</strong> If whitebark pine is not dominant tree species and is intermixed with subalpine fir and lodgepole, prescribe fire treatments could occur.</td>
<td>Proposed species</td>
</tr>
</tbody>
</table>

### Monitoring Plan

Annual monitoring for this project would include a report out with the following:

- Units implemented and their location
- Actions done within units and acres of each
- Acres of treatments within RHCAs
- Post fire burn severity for prescribed fire units greater than 1,000 acres

### Changes to the Proposed Action since Scoping

Many changes were made to clarify the proposed action and address comments received during scoping. Specifically, the level of analysis was converted from a CE to an EA. A review of the past 30 projects was also done to explore if there was any level of significance, and none was found (see the Analysis Framework on the project website for more detail: [https://www.fs.usda.gov/project/?project=58813](https://www.fs.usda.gov/project/?project=58813)). In addition, greater detail was provided for the conditions and prioritization of project activities in appendices A, B, and C. Appendix A provides in depth descriptions of the multiple analyses used to define the wildfire protection zone. Appendix B includes greater details about the historic fire return intervals, vegetation types, and analysis behind the vegetation condition class dataset. Appendix C defines what types of treatments would be needed in order to restore or maintain ecosystem function for each vegetation community found on the Salmon-Challis NF. In addition, the project area was expanded to include what was previously the North Zone Vegetation Improvement Project’s area in order to clarify project boundaries, provide a more holistic and consistent analysis of fire regimes, and make it easier for the public to assess the actions proposed, which meet the goals of both projects. Additional design features were also added after considering impacts on federally listed fish species, nesting birds, and to ensure that the proposed action was consistent with management for research natural areas, wild and scenic rivers (WSRs), and inventoried roadless areas (IRAs). See also the Themes from Feedback We Received section and the ‘Vegetation Projects Frequently Asked Questions’ document on the project website for more detail: [https://www.fs.usda.gov/project/?project=58813](https://www.fs.usda.gov/project/?project=58813).
Issues
After reviewing the scoping comments (see the Public and Agency Involvement section), input from the interdisciplinary team, and analysis of similar actions, no issues were identified that required additional analysis or consideration in this EA.

Alternatives Considered but Not Analyzed in Detail
No alternatives to the proposed action are considered in detail in this EA. The Potentially Affected section considers current and ongoing activities and trends in the analysis area and generally discusses continued trends if the proposed action is not taken (Consideration of No Action). Four alternatives were considered when developing the proposed action, but they were eliminated from detailed study (see the Analysis Framework on the project website for more detail: https://www.fs.usda.gov/project/?project=58813):

- **Idaho Roadless Areas**—The Forest Service considered an alternative that would have eliminated areas within Idaho Roadless Areas. It was eliminated from detailed study; this is because these areas are strongly tied to the need to increase the pace and scale of prescribed burning and the departure from desired vegetation conditions in these areas.

- **Wild and Scenic Rivers**—The Forest Service considered an alternative that would have eliminated areas within the WSR corridor along the Salmon River. It was eliminated from detailed study; this is because eliminating this area could create many miles of a mid-slope fire line that is prone to failure and would create an unsightly line visible from roads and the Salmon River in many locations.

- **Research Natural Areas**—The Forest Service considered an alternative that would have eliminated research natural areas from treatments. It was eliminated from detailed study because eliminating the research natural areas would create the need for many miles of fire line. Project design feature RNA-1 (Table 2) ensures that treatment units and project activities will be designed in such a way that these areas will be managed according to the guidance set forth for them.

- **Commercial Timber Harvest**—The Forest Service eliminated an alternative that would have used commercial harvest from detailed study. It was eliminated primarily because the purpose of the project is to conduct prescribed fire operations and hand thinning. The proposed project does include project design feature Fuels–4 that would determine whether commercial timber harvest within a prescribed burn unit is feasible prior to conducting a prescribed burn (Table 2).

Several comments indicated that the proposed action lacks specificity regarding the location, timing, and type of treatments to be used. While no specific locations are identified for this analysis, parameters which ensure compliance with all applicable laws and regulations are set forth in the Project Design Features (Table 2) and in the definitions of the activities proposed. Prioritization of project activities is also discussed in the proposed action (Conditions and Prioritization of Project Activities), and potential treatments are identified for vegetation communities in Appendix C. The focus of the proposed action is to increase the pace and scale of restoration and allow conditions on the ground to determine where prescribed burning and hand treatments would occur. As described in the Conditions and Prioritization of Project Activities section, when identifying locations for prescribed burning or the specific method and tools used, the Forest Service would use a variety of information sources to assess site conditions and trends, and to determine prescribed fire plans.
Tribal Consultation

Based on the nature of the project, the line officer/responsible official made the following determination regarding tribal consultation:

The Salmon-Challis NF will consult with Tribes prior to the implementation of each prescribed burn unit. Since a review of 30 past projects revealed no significant effects to Tribal resources occurs when we consult with Tribes prior to implementation of prescribed burns, the line officer/responsible official determined no significant effects are likely to occur within the project area (see the Analysis Framework on the project website for more detail: https://www.fs.usda.gov/project/?project=58813).

Public and Agency Involvement

The Forest Service engaged with many stakeholders for the proposed action, starting with a public information webinar on September 16, 2020. A 30-day scoping period was initiated on October 1, 2020, with the delivery of a scoping letter. The detailed proposed action was also posted to the project website and to the Salmon-Challis NF’s schedule of proposed actions. In addition, the Forest Service met with local and state agencies on October 9, 2020. In total, the Forest Service notified 298 parties: 235 via the United States Postal Service and 63 via email.

Twenty-four people or organizations submitted comments in response to the scoping letter. The Forest Service developed a frequently asked questions document in response to those scoping comments; it is available on the project’s website: https://www.fs.usda.gov/project/?project=58813.

All the comments have been considered by the interdisciplinary team and responsible official. A few modifications and clarifications were made to the proposed action presented in this EA (see Monitoring Plan). Other comments are addressed in the findings presented in the EA and in the analysis in supporting project implementation. Several broader comments, concerns, or questions that the Forest Service received from multiple organizations are addressed in the bullets below:

- Several comments suggested the Forest Service should use different data sources to assess vegetation conditions, trends, and departure. The LANDFIRE analysis used to understand the need for fire at a landscape scale is just one tool in assessing landscape-level needs for fire and to demonstrate a broad-scale need for increased fire. The Forest Service would use additional location-specific data (field verification and relevant research) to identify burn areas and determine specific objectives based on the conditions of the locations selected.

- Numerous comments expressed concern that the proposed action lacked information about the location of treatments and which conditions would determine the type, prioritization, and timing of treatments. In response to these comments, the Forest Service developed Appendix C, which identifies the desired conditions for vegetation communities on the Salmon-Challis NF and the treatments that would be used to move those vegetation communities toward desired conditions.

Given the nature of the proposed action, the responsible official consulted or notified the following agencies, organizations, and persons during development and analysis of the proposed action:
State and Local Governments

- State of Idaho:
  - Idaho Department of Environmental Quality
  - Idaho Department of Agriculture
  - Idaho Department of Fish and Game
  - Idaho Department of Lands
  - Idaho Department of Parks and Recreation
  - Idaho Department of Water Resources-Salmon Field Office
  - Idaho Department of Environmental Quality
  - Idaho Environmental Council
  - Idaho Governor’s Office of Energy Resources
  - Idaho Office of Species Conservation
  - Land of the Yankee Fork State Park, Idaho State Park and Recreation
- Custer County Commissioners

Agencies

- US Army Corps of Engineers
- US Environmental Protection Agency
- US Fish and Wildlife Service, Eastern Idaho Sub-Office

Elected Officials

- Regional Director for Rep. Simpson
- Regional Director for Senator Crapo
- Regional Director for Senator Risch

Individuals

Other individuals or organizations who have previously expressed an interest in Salmon-Challis NF projects or have subscribed to receive Forest Service project updates in GovDelivery.

Supporting Project Documentation

The Forest Service created a frequently asked questions document to support its consultation with agencies and other persons. The applicable document is the Salmon-Challis NF Vegetation Projects Frequently Asked Questions and is posted on this project’s website: https://www.fs.usda.gov/project/?project=58813.
Environmental Impacts Review

This environmental analysis is conducted according to the Council on Environmental Quality’s regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA), effective September 14, 2020 (40 Code of Federal Regulations [CFR] 1500–1508, 85 Federal Register 137, p. 43,357, July 16, 2020). These regulations apply to any NEPA process that begins after September 14, 2020.

The Potentially Affected Environment section describes the affected area, setting, and its resources, including ongoing and reasonably foreseeable activities and consideration of the no action alternative. Then, the subsequent sections describe how the project complies with the relevant laws, regulations, and policies, including a section on compliance with the National Environmental Policy Act. That section describes the degree of effects and other findings the responsible official would use to make a finding of no significant impact.

Consistent with current regulations for NEPA, the effects (or impacts) discussions focus on changes to the human environment from the proposed action that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action. These include the effects that occur at the same time and place as the proposed action, and may include effects that are later in time or farther removed in distance from the proposed action. Effects do not include those that the agency has no ability to prevent due to limited statutory authority or that would occur regardless of the proposed action.

Potentially Affected Environment

The proposal considers the application of prescribed fire and associated activities on National Forest System lands on the Salmon-Challis NF that are outside of designated wilderness areas; the total acreage is 2,735,600 million acres (Map 1). As described in the Conditions and Prioritization of Project Activities section, about 63 percent of these lands are moderately to highly departed from their natural regime. The proposed action includes implementation of prescribed fire on up to 8,000 acres per year, along with 2,000 acres of hand treatments annually, both would be implemented across the entire project area. As the pace and scale of prescribed burning grows, the aggregated effects of restoration may be felt across the Salmon-Challis NF; however, most direct and indirect effects would be local effects at the site or treatment unit where prescribed burning and/or hand thinning is implemented.

As described in more detail in the Purpose and Need section, the natural fire regime of many of the vegetation communities on the Salmon-Challis NF have been altered by fire suppression and other human activities over the last century. In many cases, wildfires have been less frequent but have burned with greater severity (e.g., in conifer forests) due to the high accumulations of fuels which build up between fires. These communities that are departed in composition, structure, and function are less resilient to disturbances like very large, high-severity wildfires; changing climate; invasive species; or insects and disease (Forest Service 2018; Halofsky et al. 2018a and 2018b; Barbero et al. 2015; Mclauchlan et al. 2020; LANDFIRE 2019; Graham et al. 2004).

The following resources were those identified during internal and external scoping, along with an analysis of similar projects that could have potential short- and long-term impacts from the proposed action:

- **Wildlife and plants**: Federally listed species exist, have suitable habitat, or have designated critical habitat within the Salmon-Challis NF analysis area; they could be affected by the proposed action. The project also could affect regional forester sensitive species. In addition, bird species protected by the Migratory Bird Treaty Act are present in the areas proposed for treatment. Each species has unique habitat requirements; these requirements often contrast as one species may require open or early successional habitat while another species requires mature forest. The Salmon-Challis NF provides a diverse range of sustainable habitats for many species.
Salmon-Challis National Forest Fuels Reduction and Restoration Project

- Cultural and historic resources: Cultural and historic resources and sites occur on the Salmon-Challis NF. The area of potential effect would be determined for each prescribed fire treatment area/unit and would be surveyed to determine the specific resources present, as described in the implementation checklist.

- Air quality: Air quality on the Salmon-Challis NF is good, attaining all of the National Ambient Air Quality Standards. Under the Clean Air Act (CAA), Class I airsheds include designated national monuments and national parks, international parks, and designated wilderness areas. In addition, nonfederal lands under the jurisdiction of a state or a tribe may be designated upon request. A portion of the Sawtooth Wilderness falls within the administrative boundary of the Salmon-Challis NF, and the Selway-Bitterroot Wilderness is approximately 10 miles north of the Salmon-Challis NF. Ongoing effects on air quality include human activities and smoke from wildfires. Wildfires, particularly large or severe wildfires, provide extended periods of smoke; this is because they are unplanned and may not occur when appropriate smoke dispersion will happen, and because the large amounts of available fuel and challenging terrain common on the Salmon-Challis NF make these wildfires difficult to contain. This can result in impacts on human health in nearby communities as well as impacts on the natural environment and the resources that use this environment.

- Soils and water resources: Soils and water resources:
  - The Forest Service uses the Watershed Condition Framework to characterize the health of watersheds on the Salmon-Challis NF. The most recent characterization for the Salmon-Challis NF was completed in 2016, when 310 of the 365 subwatersheds were examined and classified. Overall, 274 of the 310 watersheds are functioning properly, 36 are functioning at risk, and there are no watersheds with impaired function (Forest Service 2018).
  - In total, there are 638 miles of streams on the Salmon-Challis NF that do not meet water quality standards. The most common cause is combined biota and habitat bio-assessments that indicate aquatic life use is impaired. Additional analysis is needed to determine if nutrients or sediment are causing the impairment. Other causes for impairment include excessive temperature and sediment levels (Forest Service 2018).
  - Several areas of natural soil instability are present throughout the Salmon-Challis NF. Incidences of natural debris flows have been recorded and photographed. Landslide-prone areas have been identified on topographic maps, indicating where historical landslide-prone soils are located. Overall, monitoring and soil quality assessments indicated no unanticipated short- or long-term alteration of soil productivity and that current best management practices are effective at eliminating or minimizing adverse effects (Forest Service 2018).

- Nonnative, invasive species: Twenty-three species of nonnative, invasive plant species are known to exist on the Salmon-Challis NF. Available survey data show about 49,000 acres (7,000 sites), though existing survey information is incomplete. Canada thistle, hoary alyssum, houndstongue, leafy spurge, musk thistle, and spotted knapweed are the most common nonnative, invasive plant species on the Salmon-Challis NF. Fire is known to favor or may increase infestation of some of these species more than others (Forest Service 2015a).

- Special management areas: Special management areas:
  - There are 55 IRAs totaling 1,976,400 acres in the project area. The IRAs include 181,700 acres of Wild Land Recreation, 28,500 acres of Special Areas of Historical and Tribal Significance, 20,900 acres of Primitive, 1,650,000 acres of Backcountry/Restoration, and 95,300 acres of General Forest, Rangeland, Grassland management themes. Each IRA in the project area has its own special features and included lands designated as special areas, such as research natural areas, WSRs, and special interest areas. These areas are governed by specific agency directives and forest plan direction rather than the IRA management theme.
Within the 1,976,400 acres of designated IRAs, 1,115,700 acres (56 percent) are considered focal areas. These focal areas are core areas farther removed from roads; these are the areas that are most likely, compared with others, to have wilderness qualities.

- In the project area, there are 173,000 acres of recommended wilderness, including Borah Peak (113,200 acres), Boulder White Clouds (9,200 acres), and Pioneer Mountains (51,500 acres). These recommended wilderness areas overlap with many of the IRAs. Project activities will not occur within any designated wilderness areas.
- Forty-two miles of the Salmon WSR is in the project area, and only 0.21 miles of this WSR is within designated IRAs.

**Ongoing and Reasonably Foreseeable Management Activities**

Ongoing and reasonably foreseeable management activities on the Salmon-Challis NF include grazing, vegetation management, ecosystem and habitat restoration, invasive plant management, and mineral exploration or development. The current list of Salmon-Challis NF reasonably foreseeable actions is provided on the Salmon-Challis NF website: [https://www.fs.usda.gov/projects/scnf/landmanagement/projects](https://www.fs.usda.gov/projects/scnf/landmanagement/projects). Current and planned vegetation treatment projects include the Sheep Creek, Stormy, Jesse Creek, Big Creek, Bayhorse, Big South Lost, and Salmon-Challis Conifer Encroachment Projects. The following project areas have been excluded from this project: Sheep Creek, Stormy, Salmon Municipal Watershed Restoration, Big Creek, Bayhorse, and Big South Lost.

The proposed action could be implemented where other vegetation and invasive species management or ecosystem restoration activities have occurred, are ongoing, or are planned to occur. These management actions would be considered in selecting locations for prescribed burning or hand treatments of vegetation, identifying location-specific resource objectives, applying all applicable design features listed, and using the treatments recommended for vegetation communities identified in Appendix C. The overall intent of the proposed action, combined with the ongoing vegetation management and ecosystem restoration activities, is to move vegetation communities toward conditions which increase ecosystem function and resiliency based on their natural range of variability (see Appendices A and C), and as described in the Salmon and Challis Land and Resources Management Plans (LRMPs) (Forest Service 1987, 1988).

**Consideration of No Action**

Under the no action alternative, no prescribed burns or associated hand treatments would occur within the project area. In addition to the degraded conditions present in the project area described in the Purpose and Need section, current wildfire hazard potential for the Project Area includes 44 percent of vegetation communities that have moderate, high, or very high potential for high severity fire effects from wildfires (Table 3 and Map 4). A study observed that fuel is the most influential driver of high-severity fire in the Middle Rockies, which includes the Salmon-Challis NF (Parks et al. 2018). Treatments which reduce the amount and arrangement of fuels, such as prescribed fire and thinning, will also likely decrease the possibility of high-severity fire in treated areas (Pollet and Omi 2002; Stephens et al. 2009; Arkle et al. 2012). The no action alternative, or consequence of not addressing this, would cause a further increase of fuels in vegetation communities across on the Salmon-Challis NF, which in turn would also increase the potential for large scale wildfires with a myriad of ecological consequences triggered by high severity fire effects (Savage and Mast 2005; Coop et al. 2016; Coppoletta et al. 2016; Johnstone et al. 2016).

The lack of restoration and maintenance treatments would continue the departure from the historic fire regimes as described in Table 1. Without the application of prescribed fire or hand thinning, increased forest floor fuels, trees with an abundance of lower limbs, and an understory of younger age classes will continue to develop (Keane et al. 2002). The increasing understory creates a ladder of available fuels that can carry ground fire into crowns of the overstory trees. Wildfires in this type of stand would have a higher probability of burning restoration and maintenance treatments and would also likely burn with high intensity resulting in a stand-replacement fire, where the majority of the overstory trees are consumed. These increased fuel profiles would continue to result in
increasingly difficult suppression efforts to control future wildfires, which occur regularly on the Salmon-Challis NF (Table 3). The process of succession occurring within these ecosystems, combined with rising temperatures, would contribute to a continued increase in the probability of larger and more intense wildfires (Barbero et al. 2015). In addition, a lack of effectiveness for suppression efforts within the wildfire protection zone would increase the likelihood for damage to infrastructure and private property.

### Table 3. Wildfire Hazard Potential

<table>
<thead>
<tr>
<th>Wildfire Potential Hazard</th>
<th>Acres in the Project Area</th>
<th>Percent of Project Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low</td>
<td>758,300</td>
<td>28%</td>
</tr>
<tr>
<td>Low</td>
<td>500,800</td>
<td>18%</td>
</tr>
<tr>
<td>Moderate</td>
<td>447,700</td>
<td>16%</td>
</tr>
<tr>
<td>High</td>
<td>454,500</td>
<td>17%</td>
</tr>
<tr>
<td>Very High</td>
<td>293,200</td>
<td>11%</td>
</tr>
<tr>
<td>Non-burnable</td>
<td>278,800</td>
<td>10%</td>
</tr>
<tr>
<td>Water</td>
<td>2,200</td>
<td>&lt;0.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,735,600</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Source: Forest Service GIS 2021

A continued deficit or lack of prescribed burning and hand thinning treatments would amplify the already present wildfire hazard and myriad of potential effects of the no action alternative over time. Increasing hazardous fuels that propagate larger, more intense wildfires would have a cascading negative effect on air quality, wildlife habitat, and public health. In addition, the potential to adversely affect federally listed or sensitive species, air quality, soil resources, water quality, special management areas, and cultural resources would also continue to increase as the risk for high-severity wildfires continues to rise (Halofsky et al. 2018a and 2018b).

### National Forest Management Act – Land Management Plan Consistency

The pertinent specialists have reviewed the project and made the following determinations regarding consistency with applicable land management plan direction, standards, and guidelines.

- **Botany**: Consistent
- **Cultural/Heritage**: Consistent
- **Engineering**: N/A
- **Fisheries**: Consistent
- **Fuels**: Consistent
- **Hydrology**: Consistent
- **Lands/Special Uses**: N/A
- **Minerals**: N/A
- **Range**: Consistent
- **Recreation**: Consistent
- **Scenic Resources**: Consistent
- **Soils**: Consistent
- **Silviculture**: Consistent
- **Special Management Areas**: Consistent
- **Wildlife**: Consistent
- **Other**: N/A

The proposed action is consistent with the goals and objectives of the Salmon and Challis LRMPs, as amended (Forest Service 1987, 1988). These plans recognize the need for prescribed fire on the landscape to protect infrastructure values as well as ecological processes:
Salmon-Challis National Forest Fuels Reduction and Restoration Project

- **Goals:**
  - Use prescribed fire to accomplish resource management objectives (Forest Service 1987, Page IV-8).
  - Use prescribed fire to treat hazardous fuel conditions, accomplish range improvement and wildlife habitat improvement, and create a diversified forest condition when it is cost efficient (Forest Service 1988, Page IV-3).

- **Objectives:**
  - Emphasize the use of prescribed fire in range and wildlife habitat and forage improvement, and other vegetation manipulation projects (Forest Service 1987, Page IV-9).
  - Use prescribed fire to accomplish resource management objectives, such as reducing fuel load buildup and wildlife habitat improvement. Resource objectives and burning prescriptions will be developed at the project level (Forest Service 1988, Page IV-71).

- **Desired Conditions:**
  - Prescribed burning will have been used in wildlife and range management practices, resulting in improved vegetation conditions (Forest Service 1987, Page IV-29).

**Endangered Species Act (ESA)**

The pertinent specialists reviewed the project and made the following determinations for threatened, endangered, proposed, and candidate species and their critical habitat:

The Forest Service consulted with the US Fish and Wildlife Service and National Marine Fisheries Service about the project and the effects consistent with section 7 of the ESA. The project would be implemented to be consistent with the ESA.

Consistent with Forest Service Manual (FSM) 2670.4 and to facilitate consultation with the US Fish and Wildlife Service and National Marine Fisheries Service, a biological assessment was prepared for listed fish, wildlife, and plants. The table below provides a brief summary of the findings in the biological assessments.

The proposed action would benefit federally listed species or habitats occurring in the project area by reducing the potential for large-scale, uncharacteristic wildfires or through achieving habitat restoration objectives using prescribed fire. These benefits are considered in making determinations of effect. However, due to disturbance within and near some species’ habitats, short-term negative effects could occur; these would be discountable after application of design features and pre-project coordination, as described further in the table below.

**Table 4. Threatened, Endangered, Proposed, and Candidate Species Effect Determinations for the ESA**

<table>
<thead>
<tr>
<th>Species/Habitat</th>
<th>Status</th>
<th>Proposed or Designated Critical Habitat Present?</th>
<th>Determination*</th>
<th>Brief Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snake River Chinook salmon (&lt;i&gt;Oncorhynchus tshawytscha&lt;/i&gt;)</td>
<td>Threatened</td>
<td>Yes</td>
<td>NLAA, species and critical habitat</td>
<td>Because design features and pre-project coordination would reduce potential for any adverse effects (e.g., by locating operation sites outside of RHCAs, prohibiting ignition within one tree length of streams, locating piles at least one tree length from streams, avoiding treatments on steep slopes and sensitive soils, retaining down woody material, establishing mitigations for wildlife populations, critical habitat, and or</td>
</tr>
<tr>
<td>Species/ Habitat</td>
<td>Status</td>
<td>Proposed or Designated Critical Habitat Present?</td>
<td>Determination*</td>
<td>Brief Rationale</td>
</tr>
<tr>
<td>------------------</td>
<td>--------</td>
<td>-----------------------------------------------</td>
<td>----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Snake River Chinook salmon (<em>Oncorhynchus tshawytscha</em>) <em>(continued)</em></td>
<td>(see above)</td>
<td>(see above)</td>
<td>(see above)</td>
<td>other sensitive habitats, and use of hand tools for the construction of fire lines), the impacts from the proposed action are considered to be insignificant and discountable.</td>
</tr>
<tr>
<td>Snake River sockeye salmon (<em>O. nerka</em>)</td>
<td>Endangered</td>
<td>Yes</td>
<td>NLAA, species and critical habitat</td>
<td>Because design features and pre-project coordination would reduce potential for any adverse effects (e.g., by locating operation sites outside of RHCAs, prohibiting ignition within one tree length of streams, locating piles at least one tree length from streams, avoiding treatments on steep slopes and sensitive soils, retaining down woody material, establishing mitigations for wildlife populations, critical habitat, and or other sensitive habitats, and use of hand tools for the construction of fire lines), the impacts from the proposed action are considered to be insignificant and discardable.</td>
</tr>
<tr>
<td>Snake River steelhead (<em>O. mykiss</em>)</td>
<td>Threatened</td>
<td>Yes</td>
<td>NLAA, species and critical habitat</td>
<td>Because design features and pre-project coordination would reduce potential for any adverse effects (e.g., by locating operation sites outside of RHCAs, prohibiting ignition within one tree length of streams, locating piles at least one tree length from streams, avoiding treatments on steep slopes and sensitive soils, retaining down woody material, establishing mitigations for wildlife populations, critical habitat, and or other sensitive habitats, and use of hand tools for the construction of fire lines), the impacts from the proposed action are considered to be insignificant and discardable.</td>
</tr>
<tr>
<td>Bull trout (<em>Salvelinus confluentus</em>)</td>
<td>Threatened</td>
<td>Yes</td>
<td>NLAA, species and critical habitat</td>
<td>Because design features and pre-project coordination would reduce potential for any adverse effects (e.g., by locating operation sites outside of RHCAs, prohibiting ignition within one tree length of streams, locating piles at least one tree length from streams, avoiding treatments on steep slopes and sensitive soils, retaining down woody material, establishing mitigations for wildlife populations, critical habitat, and or other sensitive habitats, and use of hand tools for the construction of fire lines), the impacts from the proposed action are considered to be insignificant and discardable.</td>
</tr>
</tbody>
</table>
### Salmon-Challis National Forest Fuels Reduction and Restoration Project

<table>
<thead>
<tr>
<th>Species/Habitat</th>
<th>Status</th>
<th>Proposed or Designated Critical Habitat Present?</th>
<th>Determination*</th>
<th>Brief Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bull trout ((Salvelinus confluentus)) (continued)</td>
<td>(see above)</td>
<td>(see above)</td>
<td>(see above)</td>
<td>tools for the construction of fire lines), the impacts from the proposed action are considered to be insignificant and discountable.</td>
</tr>
<tr>
<td>Canada lynx ((Lynx canadensis))</td>
<td>Threatened</td>
<td>No</td>
<td>NE</td>
<td>The Salmon-Challis NF is designated unoccupied, secondary lynx habitat (Forest Service 2007). The lynx uses moist boreal forests that experience cold, snowy winters and provide a snowshoe hare prey base. The action area^4 does not provide suitable lynx habitat.</td>
</tr>
<tr>
<td>Grizzly bear ((Ursus arctos))</td>
<td>Threatened</td>
<td>No</td>
<td>NE</td>
<td>The species is not present in the action area. Grizzly bears have a wide range of habitat tolerance and a high dispersal capability, so the short-term modification of habitat is not expected to have noticeable effects.</td>
</tr>
<tr>
<td>Yellow-billed cuckoo ((Coccyzus americanus))</td>
<td>Threatened</td>
<td>No</td>
<td>NE</td>
<td>The species and habitat are not present in the action area.</td>
</tr>
<tr>
<td>Whitebark pine ((Pinus albicaulis))</td>
<td>Proposed Threatened</td>
<td>No</td>
<td>No Jeopardy</td>
<td>By considering the design features (Table 2) and best available science, the proposed Salmon-Challis Fuels Reduction and Restoration Project would not jeopardize the continued existence of whitebark pine. This determination is based on the current whitebark pine ESA guidance from the Intermountain Region, which includes 4(d) Rule exemptions to allow for optimal, flexible, and adaptive activities such as silvicultural practices resulting in short- or long-term impacts to individual whitebark pine trees or seedlings.</td>
</tr>
</tbody>
</table>

*NE = no effect; NLAA = may affect, not likely to adversely affect; LAA = may affect, likely to adversely affect; No Jeopardy = not likely to jeopardize the continued existence or adversely modify critical habitat.

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^4 The action area is the area in which activities associated with the proposed action could take place and is equal to the project area.
Supporting Project Documentation

In support of its compliance with the ESA, the Forest Service created the following supporting documents:

- Fisheries Biological Assessment
- Wildlife Biological Assessment and Biological Evaluation
- Whitebark Pine Biological Assessment

Sensitive Species (FSM 2670)

The pertinent specialists reviewed the project and made the following determinations for sensitive species:

Biological evaluations were prepared for terrestrial, aquatic, and botanical sensitive species, as required by FSM 2670. The following lists the sensitive species that the proposed action may affect, a determination of effect on those species, and a brief summary of the effects. More detailed information and an analysis for each affected species are provided in the biological evaluations. The proposed action would not contribute to a trend toward federal listing or cause a loss of viability to the population or species for any regional forester sensitive species.

Table 5. Sensitive Species Impact Determinations

<table>
<thead>
<tr>
<th>Species</th>
<th>Determination*</th>
<th>Rationale (or refer to other project documentation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bald eagle (<em>Haliaeetus leucocephalus</em>)</td>
<td>MIIH</td>
<td>Project activities may affect some marginal bald eagle habitat and may affect individual eagles. Given the wide range of this species and other areas of similar habitat, the effects are limited to individuals of this species.</td>
</tr>
</tbody>
</table>
| Bighorn sheep (*Ovis canadensis*)   | MIIH          | • Thinning and prescribed fire treatments are not recommended in alpine habitats.  
• In lower elevations, individuals may be affected during project activities, but detrimental impacts from project activities are unlikely because necessary mitigation for wildlife populations would be established prior to implementing project activities (Design Feature Wildlife 5). |
| Boreal owl (*Aegolius funereus*)     | MIIH          | • Preferred habitat may be actively treated, but design features would maintain habitat features.  
• Overstory removal will regenerate some secondary habitat and improve aspen habitat in the long term.  
• If active boreal owl nest sites are identified in the burn area, continuous disturbance likely to result in nest abandonment would not be permitted at appropriate distances from nest sites from 15 April through 15 July. |
| Columbia spotted frog (*Rana luteiventris*) | MIIH          | • Treatments are unlikely to adversely affect habitat adjacent to ponds. This is because there are few trees, and fuel loads are lighter than in forested areas.  
• Riparian area protection measures are in place that would limit activities from occurring in riparian zones, which are the most suitable habitats for spotted frogs. |
<p>| Common loon (<em>Gavia immer</em>)          | NI            | The species and habitat are not present in the action area. |</p>
<table>
<thead>
<tr>
<th>Species</th>
<th>Determination*</th>
<th>Rationale (or refer to other project documentation)</th>
</tr>
</thead>
</table>
| Fisher (Martes pennanti) | MIIH | - Design features would minimize impacts to old growth forests and riparian areas  
- Project activities are not expected to greatly increase the human presence beyond the existing level, and since fishers are mobile, they could avoid disturbances. |
| Flammulated owl (Otus flammeolus) | MIIH | - Design features would limit direct impacts on owls by meeting objectives for old growth stands and reducing disturbance near stands.  
- Preferred habitat may be actively treated, but design features would maintain habitat features.  
- If active flammulated owl nest sites are identified in the burn area, continuous disturbance likely to result in nest abandonment would not be permitted at appropriate distances from nest sites from 15 April through 15 July. |
| Gray wolf (Rocky Mountain distinct population segment) (Canis lupus) | MIIH | - Wolves are wide ranging and move through forested and non-forested country frequently.  
- There would be a decreased threat of immediate habitat loss for wolf prey under the proposed action because fire and insect risk would be reduced.  
- There would be no new roads or changes to road density. |
| Great gray owl (Strix nebulosi) | MIIH | - Design features would limit direct impacts on owls.  
- Preferred habitat (late successional Douglas-fir forest with herbaceous understory, located on flatter land adjacent to clear-cuts or large meadow openings) would not be targeted (see Appendix C); suitable habitat may be actively treated, but design features would maintain habitat features.  
- The proposed action would increase potential foraging habitat in the long term by creating more open habitat and increased prey habitat.  
- If active great gray owl nest sites are identified in the burn area, continuous disturbance likely to result in nest abandonment would not be permitted at appropriate distances from nest sites from April 15 to July 15. |
<p>| Greater sage-grouse (Centrocercus urophasianus) | MIIH | The project will comply with all current agency direction for greater sage-grouse. |
| Harlequin duck (Histrionicus histrionicus) | NI | The species and habitat are not present in the action area. |
| Monarch butterfly (Danaus plexippus) | MIIH | Project activities may affect some monarch butterfly habitat and may affect individual butterflies. Given the wide range of this species and other areas of similar habitat, the effects are limited to individuals of this species. |</p>
<table>
<thead>
<tr>
<th>Species</th>
<th>Determination*</th>
<th>Rationale (or refer to other project documentation)</th>
</tr>
</thead>
</table>
| Northern goshawk *(Accipiter gentile)*      | MIIH           | • Design features would limit direct impacts on goshawks by meeting objectives for old growth stands and reducing disturbance near stands.  
• Preferred habitat may be actively treated, but design features would maintain habitat features.  
• If active goshawk nest sites are identified in the burn area, continuous disturbance likely to result in nest abandonment would not be permitted at appropriate distances from nest sites from March 15 to August 30. |
| Peregrine falcon *(Falco peregrinus anatum)* | NI             | Project activities would not reduce or alter cliff faces or other tall structures (e.g., buildings) used for nesting, or suitable foraging habitat (e.g., wetlands, riparian areas, meadows, croplands, and river bottoms). |
| Pileated Woodpecker *(Hylatomus pileatus)*   | MIIH           | Project activities may affect marginal pileated woodpecker habitat and may affect individual pileated woodpeckers. Given the wide range of this species and other areas of similar habitat, the effects are limited to individuals of this species. |
| Pygmy rabbit *(Brachylagus idahoensis)*     | NI             | The species and habitat are not present in the action area.                                                        |
| Spotted bat *(Euderma maculatum)*            | NI             | Although the action area provides the vegetation components associated with spotted bat habitat, the species is not present in the action area. |
| Three-toed woodpecker *(Picoides tridactylus)*| MIIH           | Project activities may affect marginal three-toed woodpecker habitat and may affect individual three-toed woodpeckers. Given the wide range of this species and other areas of similar habitat, the effects are limited to individuals of this species. |
| Townsend’s western big-eared bat *(Corynorhinus townsendii)* | MIIH | • Roosting habitat for big-eared bats is likely not present.  
• Project activities would open the forest canopy and improve big-eared bat foraging opportunities in the long term. |
| Wolverine *(Gulo gulo luscus)*               | MIIH           | • Wolverine habitat and distribution, in particular for females, are related to persistent spring snow cover, not forest structure and composition.  
• Dispersal habitat conditions are very broad and include the entire Salmon-Challis NF and surrounding terrain.  
• The availability of food resources in any wolverine’s home range is unlikely to be measurably affected by the project.  
• Project activities are unlikely to disturb individual wolverines. Given the wolverine’s wide-ranging nature, there is a low probability that a wolverine would be present in the action area during implementation; if one were, it would be of very short duration. |
<p>| Pink agoseris <em>(Agoseris lackschewitzii)</em>     | NI             | There are no known occurrences in the project area.                                                                   |
| Lost River milkvetch <em>(Astragalus amnis-amissi)</em> | NI           | Habitat would not be included in a prescribed burn unit.                                                             |
| Lemhi milkvetch <em>(A. aquilonius)</em>            | NI             | There are no known occurrences in the project area.                                                                   |</p>
<table>
<thead>
<tr>
<th>Species</th>
<th>Determination*</th>
<th>Rationale (or refer to other project documentation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meadow milkvetch <em>(A. diversifolius)</em></td>
<td>NI</td>
<td>There are no known occurrences in the project area.</td>
</tr>
<tr>
<td>White Cloud milkvetch <em>(A. vexillifer var. nubilus)</em></td>
<td>NI</td>
<td>There are no known occurrences in the project area.</td>
</tr>
<tr>
<td>Seaside sedge <em>(Carex incurviformis var. incurviformis)</em></td>
<td>MIIH</td>
<td>Implementing design features would reduce the potential for direct impacts.</td>
</tr>
<tr>
<td>Flexible alpine collomia <em>(Collomia debilis var. camporum)</em></td>
<td>NI</td>
<td>Habitat would not be included in a prescribed burn unit.</td>
</tr>
<tr>
<td>Douglas’s biscuitroot <em>(Cymopterus douglassii)</em></td>
<td>MIIH</td>
<td>Implementing design features would reduce the potential for direct impacts.</td>
</tr>
<tr>
<td>Rockcress draba <em>(Draba densifolia apiculata)</em></td>
<td>NI</td>
<td>There are no known occurrences in the project area.</td>
</tr>
<tr>
<td>Stanley whitlowgrass <em>(D. trichocarpa)</em></td>
<td>NI</td>
<td>There are no known occurrences in the project area.</td>
</tr>
<tr>
<td>Welsh buckwheat <em>(Eriogonum capistratum var. welshii)</em></td>
<td>MIIH</td>
<td>Implementing design features would reduce the potential for direct impacts.</td>
</tr>
<tr>
<td>Guardian buckwheat <em>(E. meledonum)</em></td>
<td>NI</td>
<td>There are no known occurrences in the project area.</td>
</tr>
<tr>
<td>Sacajawea’s bitterroot <em>(Lewisia sacajaweana)</em></td>
<td>NI</td>
<td>There are no known occurrences in the project area.</td>
</tr>
<tr>
<td>Stanley thlaspi <em>(Noccaea [Thlaspi idahoense var. aileenae)</em></td>
<td>MIIH</td>
<td>Implementing design features would reduce the potential for direct impacts.</td>
</tr>
<tr>
<td>Challis crazyweed <em>(Oxytropis besseyi var. salmonensis)</em></td>
<td>NI</td>
<td>There are no known occurrences in the project area.</td>
</tr>
<tr>
<td>Lemhi penstemon <em>(Penstemon lehniensis)</em></td>
<td>MIIH</td>
<td>Implementing design features would reduce the potential for direct impacts.</td>
</tr>
<tr>
<td>Salmon twin bladderpod <em>(Physaria didymocarpa var. lyrata)</em></td>
<td>MIIH</td>
<td>Implementing design features would reduce the potential for direct impacts.</td>
</tr>
<tr>
<td>Marsh’s bluegrass <em>(Poa abbreviata ssp. marshii)</em></td>
<td>NI</td>
<td>Habitat would not be included in a prescribed burn unit.</td>
</tr>
<tr>
<td>Wavy-leaf thelypody <em>(Thelypodium repandum)</em></td>
<td>MIIH</td>
<td>Implementing design features would reduce the potential for direct impacts.</td>
</tr>
<tr>
<td>Idaho range lichen <em>(Xanthoparmelia idahoensis)</em></td>
<td>NI</td>
<td>There are no known occurrences in the project area.</td>
</tr>
</tbody>
</table>

* NI = no impact; MIIH = may impact individuals or habitat, but will not likely contribute to a trend toward federal listing or loss of viability to the population or species.
Supporting Project Documentation

In support of its sensitive species compliance, the Forest Service created the following supporting documents:

- Wildlife Biological Assessment and Evaluation
- Botanical Biological Evaluation
- Fisheries Biological Evaluation

National Historic Preservation Act (NHPA) – Section 106 Review

The pertinent specialist has reviewed the project and made the following determination regarding section 106 compliance:

Section 106 review meets compliance stipulations of a phased approach to implementing this project (see the comments section).

Comments

The Salmon-Challis NF would consult with the Idaho State Historic Preservation Office (SHPO) on every prescribed burn unit to determine if cultural resources are present. The Salmon-Challis NF also consults with the Tribes on each prescribed burn unit prior to any activities on the ground.

Supporting Project Documentation

The Idaho SHPO concurred with the Salmon-Challis NF’s phased approach for Section 106 consultation in an email dated December 14, 2020.

Special Management Areas (e.g., Wilderness, Roadless, etc.)

The pertinent specialist has reviewed the project and made the following determinations based on special management area presence/proximity or lack of:

Table 6. Special Management Area Compliance Determinations

<table>
<thead>
<tr>
<th>Management Area Type</th>
<th>Applicable Law/Regulation to Demonstrate Compliance</th>
<th>Rationale for Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventoried Roadless Areas</td>
<td>Idaho Roadless Area Management (36 CFR 294 Subpart C)</td>
<td>The project is consistent with Idaho Roadless Rule. In the short term, the proposed project activities would have minimal impacts on roadless area characteristics. Changes in the landscape or noise can have a negative impact on solitude and resources, such as soil, water, and plant and animal species. However, fire is also restorative in nature because it mimics natural disturbance regimes and historical landscape conditions. This provides overall benefits to the soil, water, diversity of plant and animal communities, and habitat for threatened and endangered species that depend on large, healthy, undisturbed areas of land. The project would also have short-term impacts on naturalness due to tree cutting; however, the impacts would be minimal because most roadless areas are far from designated roads and trails making access difficult and cost prohibitive. The proposed project would not authorize timber harvesting, skidding, or road construction, which have the greatest impacts to the naturalness of an IRA. Because the project mimics natural processes, negative impacts are minimized or eliminated over the long term. The positive benefits described above maintain and improve IRA characteristics.</td>
</tr>
</tbody>
</table>
### Supporting Project Documentation

The following document supports the Forest Service’s compliance with special management area compliance:

- Inventoried Roadless Areas Specialist Report

### Clean Air Act

The pertinent specialist has reviewed the project and made the following determinations regarding the CAA:

The purpose of the federal CAA (as amended) is to protect and enhance air quality while ensuring the protection of public health and welfare. National Ambient Air Quality Standards must be met by state and federal agencies, including the Forest Service, to protect human health and the environment by achieving acceptable maximum air quality concentrations. In addition, the Regional Haze Rule (40 CFR 5) calls for states to establish goals for improving visibility in mandatory Class I areas and to develop long-term strategies for reducing the emissions of air pollutants that cause visibility impairment, including emissions from fire activities.

States are given the primary responsibility for air quality management. Section 110 of the CAA requires states to develop state implementation plans that identify how the state will attain and maintain National Ambient Air Quality Standards. The CAA also allows states, and some counties, to adopt unique permitting procedures and to apply more stringent standards. The Idaho Department of Environmental Quality is the state-designated department for air quality management.
Prescribed burning would be conducted within established laws, regulations, policies, and guidelines, including PMS 484 Interagency Prescribed Fire Planning and Implementation Procedures Guide (NWCG 2017) and the requirements of the Montana/Idaho Airshed Group, which administers Idaho’s smoke management program. Prior to burning, a prescribed fire plan would be in place. The Prescribed Fire Plan Template, PMS 484-1, contains the site-specific requirements that provide the agency administrator the information needed to approve the plan and provide the prescribed fire burn boss the information needed to implement the plan. This information includes the type of burn to be conducted, the number of acres, and the location and elevation at each site. Element 19, Smoke Management and Air Quality, of the template describes how the project will comply with local, county, state, tribal, and federal air quality regulations.

The plan identifies what permits, if any, are needed. It also identifies potential smoke receptors, nonattainment areas, Class I areas, and restricted areas that may be affected. Prescribed fire plans are submitted to the Montana/Idaho Airshed Group, which develops a daily burn decision based on current and forecasted air quality and weather conditions. This limits the accumulation of smoke from prescribed burns within each airshed. Prescribed fire plan development and following the daily burn decisions of the Montana/Idaho Airshed Group ensure that air quality requirements of the CAA would be met.

Clean Water Act

The pertinent specialist has reviewed the project and made the following determination:

This project is consistent with the Clean Water Act. Design feature Soils, Waters, and Fisheries-2 would prevent hazardous chemicals from entering local streams. Under the proposed action, the Forest Service would rehabilitate fire lines to prevent erosion and sedimentation. In addition, design features Soils, Water, and Fisheries-5 and 6 would prohibit fire line construction, felling trees, and ignitions within one tree length of streams. This also would prevent sediment from entering streams and would retain canopy cover and shade over the streams. These design features would minimize impacts on water quality for impaired stream segments within the project area during implementation. Over the long term, improving watershed condition should decrease sedimentation and improve water quality.

Prescribed burning, particularly pile burning, have the potential to create areas of high severity burn impacts to soils. This is due to the length of time heat occurs in concentrated areas, causing loss of soil physical, biological, and chemical functions and a decrease in organic matter needed for future soil nutrient stores. The proposed prescribed burning is designed to result in low- to moderate-severity fire effects based on parameters that would be specified in a prescribed fire plan. In addition, project design features and pre-implementation coordination with soil scientists have been developed for this project to ensure soil functions and, therefore, soil quality are maintained. Localized minor erosion is expected, but it would not affect the area’s long-term soil productivity and would not reach local streams after implementation of the project design features listed in Table 2. Prescribed fires, when it results in low to moderate severity post fire effects, can also result in a positive soil response by expediting nutrient cycling, decreasing woody canopy cover, improving herbaceous response, and improving overall vegetation ground cover, which improves overall soil functions. Generally, localized negative impacts on the soil resources would be short lived. This is because prescriptions would occur according to a pre-defined prescription which identifies favorable weather conditions. Prescribed fire units would be planned to result in favorable fire behavior and fire effects, and best management practices would be implemented throughout treatment unit implementation.
Pertinent Executive Orders

The line officer or applicable specialist(s), or both, have determined the project is in compliance with the following executive orders (EOs), which were deemed pertinent based on the nature of the project.

EO 11988, Floodplain Management and EO 11990, Protection of Wetlands
This project is consistent with EO 11988 because there would be minimal ground disturbance within floodplains for fire lines, pile burning, and direct ignitions. Design features Soils, Water, and Fisheries-5 and 6 would prohibit pile burning, fire line construction, or direct ignitions within one tree length of stream channels. Prescribed fires may back into riparian vegetation areas, and hand thinning may occur. Project design features would protect floodplains.

This project is also consistent with EO 11990. No ground-disturbing activities would occur within wetlands. Wetland integrity would also be protected by using best management practices and design features for the protection of riparian areas and meadows.

EO 13007, Indian Sacred Sites
EO 13007 requires the Forest Service to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites. Sacred sites are defined as “any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site.” It also requires agencies to develop procedures for reasonable notification of proposed actions or land management policies that may restrict access to or ceremonial use of, or adversely affect, sacred sites.

While the email concurrence from SHPO (see National Historic Preservation Act (NHPA) – Section 106 Review section above) does not expressly discuss EO 13007, it does require reasonable notification and consultation prior to the implementation of policies that may restrict access or use, or affect sacred sites. See Tribal Consultation above for consultation with Tribes to date.

In addition, during implementation of the project, tribal consultation would be ongoing. As units or locations for project activities are identified, the Forest Service would complete tribal consultation to identify potential locations for cultural burning or historic properties with traditional religious and cultural significance that may need to be avoided.

EO 13112, Invasive Species
The Forest Service analyzed nonnative, invasive plant spread for 23 species known to exist on the Salmon-Challis NF (Forest Service 2015a). Weeds usually become established in natural communities where soil disturbance has provided suitable conditions for weed seed germination, where ground vegetation is disturbed and unable to outcompete the invaders, and (in forested areas) where tree canopy removal or thinning has allowed additional sunlight to reach the ground. The proposed project activities would provide favorable conditions for establishment and spread for a number of weed species, depending on the community’s resistance to invasive species.

Recognizing the need to account for community susceptibility related to community resistance, the Forest Service has incorporated coordination and design features into the proposed action that reduce or minimize the potential for introduction or spread of invasive species. Mitigation includes pre-implementation review of the risk level for potential susceptibility to introduction or spread of invasive species (see Coordination Prior to Project Activities) and post-treatment monitoring. The design features and pre-implementation review considerably reduce the risk of spreading nonnative, invasive plants.
EO 13186, Migratory Birds

Under the National Forest Management Act, the Forest Service is directed to “provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives” (Public Law 94-588, Section 6(g)(3)(B)). Direction for integrating migratory bird conservation into forest management and planning includes the January 2000 Landbird Conservation Strategic Plan, the Partners in Flight Landbird Conservation Plans, and the 2001 EO 13186.

According to the 2008 Memorandum of Understanding between the USDA Forest Service and the US Fish and Wildlife Service to Promote the Conservation of Migratory Birds, the Forest Service shall “consider approaches, to the extent practicable, for identifying and minimizing take that is incidental to otherwise lawful activities” (Forest Service and Fish and Wildlife Service 2008). Within the national forests, migratory bird conservation focuses on providing a diversity of bird habitats at multiple spatial and temporal scales over the long term.

This project focuses on improving ecosystem resiliency on the Salmon-Challis NF (see Purpose and Need). Individual migratory birds may be unintentionally adversely affected during project activities in the short term. Migratory birds would likely avoid treatment areas during project implementation and be displaced to nearby habitat. Project implementation includes design elements to protect migratory birds through snag retention, timing restrictions, and avoidance of known nests. As a result, effects on reproduction would be minimal, and bird populations would not be affected. In the long term, proposed actions would improve habitat for some species of migratory birds, as explained in the Purpose and Need section. The proposed project would result in “minor” impacts on migratory birds. This determination is based on the following rationale:

- Design features would reduce the potential for impacts on breeding birds.
- All impacts would be limited to local populations of migratory birds and would likely be limited to only individuals.

Overall, the long-term benefits of proposed activities on wildlife habitat for migratory bird populations would outweigh any short-term, adverse effects on a small number of individuals.

Supporting Project Documentation

The following documentation supports the Forest Service’s compliance with EOs:

- Wildlife Biological Assessment and Evaluation

Effects to Climate and Carbon

Climate change has ongoing effects on various resources in the analysis area. On the Salmon-Challis NF, wildfires are projected to increase in size, severity, and frequency due to increasing summer temperatures. These increasing temperatures could also increase bark beetle-caused tree mortality (Halofsky et al. 2018a and 2018b). It is predicted that Salmon-Challis NF forested vegetation communities would continue to have a higher risk of climate-induced, large fire events (Forest Service 2018). Fire modeling identified climate as the second greatest variable driving high severity wildfires on the Salmon-Challis NF (Parks et al. 2018). This increased potential for large fire events could potentially be detrimental to various species’ habitat, municipal watersheds, and the wildland-urban interface. The potential increase in large fire, and in particular very large fire, has important implications for ecosystems, regional air quality, communities, and carbon emissions (Barbero et al. 2015). Primary adaptation strategies for forest vegetation focus on maintaining low tree densities, promoting the diversity of forest structure, and increasing disturbance-resilient species by conducting thinning treatments and reducing density through prescribed fire (Halofsky et al. 2018a and 2018b).

Forested vegetation communities on the Salmon-Challis NF are maintaining relatively stable carbon stocks, but whether they are acting as carbon sinks or sources is unclear. The effects of climate change are complex, but it is likely that forested vegetation communities on the Salmon-Challis NF may be vulnerable to a variety of stressors,
as discussed above. It is unknown how climate change’s potential for vulnerability would be offset by the possible positive effects of a longer growing season, greater precipitation, and elevated atmospheric carbon dioxide concentrations. What is known is that the forested vegetation communities of the Salmon-Challis NF will likely persist and have an important role in regional carbon dynamics in the coming decades (Dugan et al. 2021).

**National Environmental Policy Act**

The effects discussion here takes into consideration all information included in the Environmental Impacts Review section, as well as supporting documentation included in the project record. Pertinent specialists have reviewed the proposed activities; they provided the following input regarding the degree of potential effects for the factors considered by the responsible official to determine a finding of no significant impact.

Based on the consideration of the potentially affected environment and the degree of effects (below), the effects of the proposed action, including implementation of the design features and coordination prior to project activities, would not be significant.

**Factors Considered for the Degree of Effects**

**Summary**

A review of 30 previous projects containing similar prescribed fire and hand thinning treatments as proposed in this project found no significant impacts for the resources included in this EA. This project would not authorize the types of projects that would have greater potential for significant impacts such as timber harvests, mechanical vegetation treatments, or road construction and maintenance. While the proposed action would authorize prescribed fire implementation across the Salmon-Challis NF, the analysis of all previous, individual prescribed fire projects have resulted in no significant impacts. This indicates that impacts from individual treatment units implemented under the proposed action would not reach the level of significance. This aligns with the analysis for each resource in the Environmental Impacts Review section where no significant impacts were observed for threatened, endangered, or sensitive species; cultural resources; water quality; air quality; special management areas; soil resources; non-native invasive species; and migratory birds. In summary, since this project would authorize similar activities as previously conducted on the Salmon-Challis NF in the same manner, past experience shows this is a routine action lacking significance (see Analysis Framework on the project website for more detail: https://www.fs.usda.gov/project/?project=58813).

Compared to the No Action Alternative where no treatments would occur in the project area, the proposed project would include up to 8,000 acres of prescribing burning along with 2,000 acres of supporting hand treatments annually. This increased treatment of forests on the Salmon-Challis NF would reduce fuel loads, which is a primary driver of high-severity fire in the Salmon-Challis NF. In addition, prescribed burn treatments have been shown to decrease the possibility of high-severity fire in treated areas (Parks et al. 2018). Prescribed fire treatments would move forests on the Salmon-Challis towards their natural range of variability, improve ecosystem resiliency, and reduce wildfire hazard. In addition, treatments would reduce the risk to health, safety, and structures and the likelihood for damage to infrastructure and private property.

Overall, the interdisciplinary team did not identify any significant adverse effects associated with implementing the proposed action and determined that the overall, long-term effects of implementing the project are expected to be beneficial.

**Effects on public health and safety**

Prescribed fire application and hand treatment of vegetation would benefit public and firefighter safety by reducing hazardous fuels in the areas where project activities are implemented (see the Purpose and Need).

Prescribed fire planning would be consistent with the Interagency Prescribed Fire Planning and Implementation Procedures Guide (PMS-484) (NWCG 2017), which establishes national interagency standards. These standards
describe what is required for prescribed fire planning and implementation; prioritize firefighter and public safety; and ensure that risk management is incorporated into all prescribed fire planning and implementation to support safe, carefully planned, and cost-efficient prescribed fire operations. One aspect of this is developing a prescribed fire plan that provides site-specific parameters to provide for safety and all other considerations defined, analyzed, and reviewed within the plan.

Prescribed burning may also affect public health and safety through effects on air quality from smoke. This is addressed under the Clean Air Act section. The prescribed fire plan process and this project’s design features ensure compliance with the CAA, as implemented by the State of Idaho. By following these regulations and only burning on authorized days, the effects on public health are reduced. The Forest Service would anticipate the effects to be short term and local in nature. Public notice of planned burning would also lessen the degree of effects.

Effects that would violate federal, state, tribal, or local laws protecting the environment

The interdisciplinary team participated in development of the proposed action, including the project design features and the coordination prior to project activities, which ensures that the project complies with law, regulation, policy, and the forest plans. As described in the previous sections, the effects would be within standards set forth by the LRMPs and consistent with applicable environmental laws.

**Administrative Review**

The proposed action is an activity implementing a land management plan and is subject to the pre-decisional objection process at 36 CFR 218 (A) and (B). Only those who submitted timely and specific written comments (36 CFR 218.2) regarding the proposed action or activity during scoping in October 2020 are eligible to file an objection (36 CFR 218.24(b)(6)). The publication date of the legal notice in the newspaper of record is the exclusive means for calculating the time to submit written comments on a proposed action or activity.
Salmon-Challis National Forest Fuels Reduction and Restoration Project

Draft Decision Notice

Salmon-Challis National Forest Fuels Reduction and Restoration Project

US Forest Service

Challis-Yankee, Leadore, Lost River, Middle Fork, North Fork, and Salmon-Cobalt Ranger Districts, Salmon-Challis National Forest

Butte, Custer, and Lemhi Counties, Idaho

Decision and Rationale

I have decided to authorize activities described in the “Proposed Action,” including modifications identified during the environmental analysis and review of regulatory compliance, as follows:

In reaching my decision, I relied on an interdisciplinary team to analyze the effects of the proposed action documented in the EA. I considered the following concerns, and anticipated effects on the vegetation, federally listed species, Forest Service sensitive species, air quality, water and soil resources, non-native invasive species, and special management areas in the project area. I also reviewed the project design criteria included in the EA (Table 2), reviewed public comments received during the public scoping comment period (see Public and Agency Involvement), and considered how the selected alternative will address the stated purpose and need.

I chose the selected alternative and design criteria for several reasons. Overall, the selected alternative would provide a coordinated effort to increase the ecological resiliency of vegetation communities in the project area. In addition, the selected alternative would reduce the number of NEPA analyses required for individual projects, which would thus allow projects to be implemented at a faster rate and increase the overall acreage of prescribed burning annually.

There may be some short-term effects associated with the selected alternative, such as impacts on federally listed species or Forest Service sensitive species, inventoried roadless areas, water quality, and soil resources. Project design features are included to reduce the potential for, and intensity of, adverse effects, which are expected to be minimal (Table 2). After implementation of project design features, any short-term effects to resources listed above were reduced to insignificant levels. Over the long term, the selected alternative would result in movement of vegetation communities toward conditions, which would improve the ecological resiliency of these ecosystems and reduce the risk of large, high-severity fires and insect and disease outbreaks. These effects are detailed in the Environmental Impacts Review section.

When time comes to implement the project, we will follow the coordination steps outlined in the Coordination Prior to Project Activities section and employ project design features (Table 2) to minimize adverse effects. A review of 30 similar past projects found that no significant impacts were identified for the resources included in this EA. We keep authorizing and implementing these same prescribed burning activities over and over in the same manner on the Salmon-Challis NF without evidence of significance for most resources. Our review of past projects supports and provides compelling evidence that prescribed burning activities like those proposed in this project are routine on the Salmon-Challis NF and do not result in significant effects (see the Analysis Framework on the project website for more detail: https://www.fs.usda.gov/project/?project=58813).

The selected alternative and project design criteria have been refined in response to suggestions made by the public and further consideration by the interdisciplinary team. Further, the EA has been revised to include greater detail on how projects would be prioritized (see Conditions and Prioritization of Project Activities Error! Reference source not found.) and what treatments would be applied for each vegetation communities in the project area (see Appendix C).
Summary of Public Involvement

A list of agencies, organizations, and persons regarding this proposal is provided in the analysis.

The Forest Service engaged with many stakeholders for the proposed action, starting with a public information webinar on September 16, 2020. The project went out for a 30-day scoping period on October 1, 2020. The detailed proposed action was also posted to the project website and to the Salmon-Challis NF schedule of proposed actions. In addition, the Forest Service met with local and state agencies on October 9, 2020. In total, the Forest Service notified 298 parties: 235 via the United States Postal Service and 63 via email.

Twenty-four people or organizations submitted comments in response to the scoping letter. The Forest Service made a few modifications and clarifications to the proposed action presented in this EA. Specifically, more detail was provided for the conditions and prioritization of project activities in appendices A, B, and C, which provide greater detail about the wildfire protection zone, the vegetation condition class, and what treatments would be considered for each vegetation community found on the Salmon-Challis NF. In addition, the project area was expanded to include the North Zone Vegetation Improvement Project in this analysis to clarify project boundaries and make it easier for the public to assess both projects. Design features were also added after considering impacts on federally listed fish species and to ensure that the proposed action was consistent with management for research natural areas, WSRs, and IRAs.

Findings

The draft decision notice incorporates all previous information in the EA and finding of no significant impact, as well as information included in the project record. Findings required by other laws, regulations, and policy applicable to the proposal can be found in the Environmental Impacts Review section.

For the reasons below, I found there to be no significant effects when project design features were implemented (Table 2) and coordination occurred (see Coordination Prior to Project Activities); therefore, an environmental impact statement will not be prepared:

- The lack of issues (see the Analysis Framework on the project website for more detail: https://www.fs.usda.gov/project/?project=58813).
- Review of previous activities found actions proposed here to lack significant impacts (see the Analysis Framework on the project website for more detail: https://www.fs.usda.gov/project/?project=58813)
- Analysis documented in the EA and including sensitive species, vegetation, water and soil resources, cultural resources, air quality, special management areas, and invasive species found impacts from this project to be below those considered as thresholds for significance for those resources. I found that significance was lacking because:
  - Design features and pre-project coordination reduced effects to federally listed species and Forest Service sensitive species below the thresholds for significance and did not lead to the listing of any additional species.
    - Due to disturbance within and near some federally listed fish species’ habitats, short-term negative effects could occur; these would be discountable after application of project design features and pre-project coordination, as described further in the Endangered Species Act (ESA) section.
    - The proposed action would not contribute to a trend toward federal listing or cause a loss of viability to the population or species for any regional forester sensitive species.
  - Prescribed fire plan development and following the daily burn decisions of the Montana/Idaho Airshed Group ensure that air quality requirements of the CAA would be met.
Salmon-Challis National Forest Fuels Reduction and Restoration Project

- Design features would reduce impacts on water quality for stream segments within the project area during implementation. Over the long term, improving watershed condition should decrease sedimentation and improve water quality.
- SHPO concurred with the Salmon-Challis NF’s phased approach to Section 106 consultation with each prescribed burn unit undergoing an analysis of potential cultural resources in that unit.
- Through implementation of project design features, the proposed project would not affect the free-flowing condition and water quality of any WSRs.
- Tree cutting in IRAs would affect the naturalness in the short-term; however, impacts would be minimal since IRAs are typically remote making access difficult and cost prohibitive. In addition, the proposed project would not authorize timber harvest or road construction, which have the largest impacts on naturalness for IRAs. Since the project mimics natural processes with minimal potential for impacts, I found that negative impacts are minimized or eliminated over the long term and are outweighed by the positive benefits of the project.
- Overall, I found that the prescribed burns authorized under this project would improve the health and resilience of vegetation on the Salmon-Challis NF through reducing fuels, restoring natural fire regimes, and restoring the natural range of variation.

**Implementation**

I anticipate implementation of this decision to begin in Fall 2022.

**Administrative Review and Objections**

The proposed action is an activity implementing a land management plan and is subject to the pre-decisional objection process at 36 CFR 218 Subparts A and B.

**How to Object and Time Frame**

The opportunity to object ends April 11, 2022 following the date of publication of the legal notice in the Recorder Herald and Challis Messenger. The publication date of the legal notice in the newspaper of record is the exclusive means for calculating the time to file an objection; those wishing to object should not rely on dates or time frame information provided by another source.

Objections will be accepted only from those who have previously submitted specific written comments regarding the proposed action during scoping or other designated opportunity for public comment. Issues raised in objections must be based on previously submitted timely, specific, written comments regarding the proposed action, unless they are based on new information arising after designated comment opportunities (36 CFR 218.8(c)).

The objection must contain the minimum content requirements specified in 36 CFR 218.8(d); incorporation of documents by reference is permitted only as provided in 36 CFR 218.8(b). It is the objector’s responsibility to ensure timely filing of a written objection with the reviewing officer. All objections are available for public inspection during and after the objection process.

Written objections, including attachments, must be filed with Charles A. Mark, Forest Supervisor; 1206 S. Challis Street, Salmon, ID 83461; fax (208-756-5151); office (208-756-5100). The office business hours for those submitting hand-delivered objections are 8:00 a.m. to 4:30 p.m. Monday through Friday, excluding holidays. Due to current covid restrictions, please call ahead to schedule an office visit. Electronic objections must be submitted in a format such as an email message, plain text (.txt), rich text format (.rtf), or Word (.doc, .docx) to christine.droske@usda.gov.
References


Map 1: Project Area
Map 2: Wildfire Protection Zone
Map 3: Departure from Historical Fire Regimes
Map 4: Wildfire Hazard Potential
Appendix A—Wildfire Protection Zone—Description of Analysis and Final Dataset

Background

Managing the natural role of fire while protecting values from adverse impacts of fire is a challenge. Current science on landscape fuel treatment scenarios supports using a risk-based analysis process to mitigate the adverse impacts associated with wildland fire and to inform decision-making prior to the start of a wildland fire.

The wildfire protection zone dataset is a result of calculating the wildfire threat and the impact on values to produce a rating for all areas within the Salmon-Challis NF’s administrative boundaries. The resulting spatial layer shows where a high likelihood exists for wildfire to affect infrastructure, private property, and other identified social and economic values within or near the Salmon-Challis NF boundaries. It is based on the potential for wildfire occurrence, expected fire behavior, and ability of suppression resources to control a wildfire.

Areas located within this wildfire protection zone polygon have a moderate to very high (60–100 percent) probability of fire affecting the approximately 4,000 structures identified during 90th to 97th percentile weather conditions, which historically have occurred within July, August, and September. Also included is a buffer for boundaries between the Salmon-Challis NF administrative boundaries and land or property of other ownership.

Wildfire Threat Analysis

A fire frequency simulation was used to determine the probability a given pixel of spatial data would burn over a given time. FlamMap\(^5\) Minimum Travel Time was used to simulate actual historic ignitions that occurred across the landscape for the period from 1992 to 2014. The Fire Program Analysis dataset was used as the source for historic ignition data across all ownerships, as this is the most comprehensive dataset that is available. All fires that occurred each year were simultaneously simulated for 24 hours and overlaid in a geographic information system to develop a frequency of where fire would likely affect the analysis area in the absence of suppression actions. The outputs were then ranked from low to high frequency.

The moderate fire frequency distribution was used to establish a baseline for the risk inputs. This is because it captured the mid-point values that pose a potential wildfire threat.

Impact on Values Analysis

This analysis was done to determine the probability a fire could affect a value over a given burn period(s). “Values,” “values-at-risk,” or “highly valued resources and assets” are important from a fire protection perspective. Their location and the anticipated fire behavior for their surrounding area are what operational strategy uses to identify tactics that will minimize damages from fire.

Wildfire ANALYST™ software was used to develop a probabilistic output on the amount of time it would take a fire to reach a pre-identified value. Time is usually defined by the number of hours within multiple burn periods.

A comprehensive wind and weather analysis was performed to determine the 90th and 97th percentile values. Once these parameters were identified, each value at risk was input into the model and then simulated 100 times.

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\(^5\) FlamMap is a fire behavior mapping and analysis software application that computes potential fire behavior characteristics (such as spread rate, flame length, and fireline intensity) over an entire landscape under constant weather and fuel moisture conditions input by the user.
for 24 hours of active burning using a range (90th to 97th percentiles) of weather parameters (temperature, relative humidity, wind speed, and wind direction).

### Final Fire Risk Classification

The outputs from modeling the wildfire threat and impact on values analyses were used to calculate a final score that displays the relative risk of wildfires affecting pre-identified values. Outputs from the analyses were then converted to polygons and buffered just a small distance to get a more generalized or connected polygon shape.

### Final Delineation of Polygon

Slight edits from initial polygons calculated above to the final polygons consisted of:

- **a)** Keeping just the immediate yellow jacket proper and removing the crab claw, which surrounded the wilderness peninsula
- **b)** Removing the northernmost extension that took in the Spring Creek Mines above the Salmon River
- **c)** Removing the extensions up Napoleon Hill and Diamond and Sims Mines
- **d)** Filling in the donut holes at Big Creek Hot Springs and Ulysses Mountain
- **e)** Removing the extension to Haidee Mine
- **f)** Removing the extension to Blackbird Mine
- **g)** Adding a zone around the ranch where White Goat Creek and Camas Creek come together
- **h)** Merging the 1-mile buffer of BLM landownership
- **i)** Merging where a 1-mile buffer of BLM landownership occurs within the forest administrative boundary

### Glossary (from Risk Terminology Primer [Thompson et al. 2016])

The following are included here to ensure consistent usage of terms related to wildfire risk analyses:

- **Asset**—A person or human-made entity (e.g., structure, information, material, or process) that has value
- **Burn**—Probability that a wildfire will burn a specified area during a specified period of time
- **Consequence**—The outcome or effect of an event or incident, usually evaluated with respect to objectives
- **Burning period**—That part of each 24-hour period when fires spread most rapidly, typically from 10:00 a.m. to sundown
- **Exposure**—The contact of an entity, asset, resource, system, or geographic area with a potential hazard. In landscape assessments, resource and asset exposure can be quantified by overlaying spatial fire likelihood and intensity outputs with maps of resources and assets. In incident response, fire responder exposure can be characterized by the type of activity (e.g., direct versus indirect, ground versus aerial) and quantified by multiplying assignment hours by historical accident rates.
- **Frequency**—The number of occurrences of an event per a specified period of time
- **Hazard**—Any real or potential condition that can cause damage, loss, or harm to people, infrastructure, equipment, natural resources, or property. Hazards associated with fire typically include fire line intensity, flame length, and crown fire potential. Other hazards associated with the fire response environment may include snags, steep slopes, equipment malfunction, and smoke inhalation.
Hazard reduction—Coordinated activities and methods directed to reduce or eliminate conditions that can cause damage, loss, or harm from real or potential hazards. Landscape hazard reduction is often accomplished through prescribed burning or mechanical fuels reduction or restoration treatments. Fire responder hazard can be reduced through practices such as creating safety zones and cutting snags in advance of line construction projects. These actions in and of themselves expose those engaged in the activity to the hazards inherent in such work.

Likelihood—The chance of an event happening. Likelihood can be described by using probability or frequency over a specified time period, or with more general descriptive language. Likelihood can often be expressed in relative terms (e.g., event A is twice as likely as event B). In practice, this term can effectively be used interchangeably with probability.

Probability—A measure of the chance of event occurrence, quantified as a numerical value between zero and one. Zero reflects the impossibility of occurrence; one reflects absolute certainty of occurrence. In practice, this term can effectively be used interchangeably with likelihood.

Susceptibility—The propensity of an asset or resource to experience a positive or negative effect as a result of exposure to a hazard. Modifications to a building (e.g., changing to a fire-resistant roof covering and adding screens to vents) make it less susceptible to fire damage.

Threat—An event, individual, entity, or action that has the potential to harm life, information, operations, the environment, or property, or a combination thereof.

Uncertainty—A fundamental lack or limitation of knowledge. Uncertainty may stem from many causes, including a lack of data or information, knowledge gaps, and the inherent variability and unpredictability of human and natural systems. Uncertainty is often indexed or quantified by using probability.

Values-at-risk—Those ecologic, social, and economic assets and resources that could be affected by fire or fire management actions. Examples include life, property, structures, natural and cultural resources, community infrastructure, public support, economic opportunities such as tourism, and air quality.

Vulnerability—The physical feature or attribute that renders values susceptible to a given hazard.
Appendix B—Vegetation Condition Class and Historical Vegetation Types

Description of Analysis and Datasets

Broad-scale alterations of historical fire regimes and vegetation dynamics have occurred in many landscapes in the US through the combined influence of land management practices, fire exclusion, ungulate herbivory, insect and disease outbreaks, climate change, and invasion of nonnative plant species. The LANDFIRE Program produces spatial datasets of simulated historical fire regimes and vegetation conditions using the LANDSUM landscape succession and disturbance dynamics model. The LANDFIRE Program also produces spatial datasets of current vegetation and measurements of current vegetation departure from simulated historical reference conditions. How different the current vegetation on a landscape is from the estimated historical conditions is categorized on a scale from low to high departure, which LANDFIRE’s Vegetation Condition Class (VCC) dataset quantified spatially (Table B-1). The extent to which a system has departed from historical conditions influences the extent to which key ecosystem components, critical to the integrity and function of the ecosystem, are altered. Departure is distinguished via three categories:

1. VCC 1 represents ecosystems with low (less than 33 percent) departure.
2. VCC 2 indicates ecosystems with moderate (33 to 66 percent) departure.
3. VCC 3 indicates ecosystems with high (greater than 66 percent) departure from reference conditions.

LANDFIRE’s biophysical settings (BpS) data layer represents the vegetation that may have been dominant on the landscape prior to Euro-American settlement and is based on both the current biophysical environment and an approximation of the historical disturbance regime. LANDFIRE’s BpS dataset was used to obtain the spatial locations and distribution of historical fire regimes located within the Salmon-Challis NF’s administrative boundaries. Those 44 total fire regime classifications were then collapsed into a total of 20 historical vegetation groups. This was done to improve accuracy and usage at the forestwide scale, as suggested within the LANDFIRE Modifying Data Guide (2016) and using the following as guidance:

- Forest specialists’ reviews of BpS descriptions and fire regime information by the wildlife biologist, rangeland specialist, hydrologist, soil scientist, fuels and timber program manager, fire staff officer, fish biologist, and both internal and external fire ecologists
- BpS state and transition models, succession classes assigned, descriptions, and literature citations revised and updated in 2019 by LANDFIRE

One BpS model was chosen to represent each historical vegetation group (Table B-1), based on the following:

- The BpS within that resulting group with the greatest amount of acreage
- The most similar species, habitat types, and ecological function
- The type of fire regime and fire return intervals
- Forest specialist input
- Review of data by the LANDFIRE team, and Salmon-Challis NF and regional fire ecologists

For more detailed descriptions, see the crosswalk used to build this dataset within the dataset’s metadata, and LANDFIRE’s website, which includes how to download individual PDFs with habitat descriptions, fire regime information, and literature citations for each BpS (https://landfire.gov/).
Table B-1. Average Acres Burned Annually and the Number of Acres Departed from Historical Conditions within the Project Area

LANDFIRE’s BpS dataset for the Salmon-Challis NF was grouped into the historical vegetation communities listed, based on similar fire regimes and local specialist input. LANDFIRE’s VCC dataset was used to determine acres departed; it displays how different the current vegetation on a landscape is from the estimated historical conditions on a scale that ranges from low to high departure. The mean fire return interval was taken from LANDFIRE’s published and peer-reviewed model description for the BpS used to classify the historical vegetation community and to derive the total acres burned annually on average. More information can be found on LANDFIRE’s website: [https://landfire.gov/](https://landfire.gov/).

<table>
<thead>
<tr>
<th>Historical Vegetation Community</th>
<th>Total Acres of Each Group</th>
<th>Mean Fire Return Interval all fire types (years)</th>
<th>Average Acres Burned per Year Historically</th>
<th>Acres Departed from Historical Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Forest Types</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper Subalpine Forest/Whitebark Pine</td>
<td>455,800</td>
<td>180</td>
<td>2,600</td>
<td>5,100</td>
</tr>
<tr>
<td>Lower Subalpine Forest</td>
<td>378,900</td>
<td>136</td>
<td>2,900</td>
<td>337,100</td>
</tr>
<tr>
<td>Douglas-fir Forest</td>
<td>509,300</td>
<td>27</td>
<td>20,800</td>
<td>4,800</td>
</tr>
<tr>
<td>Douglas-fir/Ponderosa Pine Forest</td>
<td>275,100</td>
<td>19</td>
<td>16,400</td>
<td>267,100</td>
</tr>
<tr>
<td>Ponderosa Pine Savannah</td>
<td>158,400</td>
<td>13</td>
<td>12,400</td>
<td>700</td>
</tr>
<tr>
<td>Aspen</td>
<td>900</td>
<td>31</td>
<td>&lt;100</td>
<td>0</td>
</tr>
<tr>
<td><strong>Sagebrush Types</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mountain Big Sagebrush</td>
<td>366,900</td>
<td>29</td>
<td>13,600</td>
<td>2,100</td>
</tr>
<tr>
<td>Wyoming Big Sagebrush</td>
<td>1,600</td>
<td>60</td>
<td>2,700</td>
<td>1,500</td>
</tr>
<tr>
<td>Basin Big Sagebrush</td>
<td>152,500</td>
<td>79</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Dwarf Sagebrush</td>
<td>60,051</td>
<td>202</td>
<td>300</td>
<td>0</td>
</tr>
<tr>
<td><strong>Other Types</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alpine Vegetation Types</td>
<td>4,900</td>
<td>233</td>
<td>&lt;100</td>
<td>4,400</td>
</tr>
<tr>
<td>Curl-leaf Mahogany/Shrub Mix</td>
<td>97,000</td>
<td>69</td>
<td>1,500</td>
<td>300</td>
</tr>
<tr>
<td>Deciduous Shrubland</td>
<td>6,500</td>
<td>81</td>
<td>100</td>
<td>5,000</td>
</tr>
<tr>
<td>Grasslands</td>
<td>29,100</td>
<td>17</td>
<td>1,800</td>
<td>11,300</td>
</tr>
<tr>
<td>Montane/Foothill Riparian</td>
<td>18,900</td>
<td>51</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Subalpine/Upper Montane Riparian</td>
<td>70,100</td>
<td>79</td>
<td>1,000</td>
<td>67,700</td>
</tr>
<tr>
<td>Barren – Rock/Sand/Clay</td>
<td>103,900</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Open Water</td>
<td>3,400</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Snow and Ice</td>
<td>7,800</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Sparse Vegetation</td>
<td>47,200</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Grand Totals</strong></td>
<td><strong>2,735,600</strong></td>
<td><strong>76,700</strong></td>
<td>708,100</td>
<td>1,456,800</td>
</tr>
</tbody>
</table>

Source: Forest Service GIS 2021

¹ Includes those cover types that do not typically burn, such as open water, snow-ice, urban areas, and agricultural fields
Historically, fires burned on the Salmon-Challis NF in a range of frequencies, or fire return intervals, which resulted in a patchy mosaic of diverse vegetation communities. Elevation, topography, and local site conditions all influenced what kind and how much vegetation grew after these fires occurred. This wide variation in vegetation densities with fine grain patches of mixed-age classes within them also influenced how much and how intensely wildfires burned and the resulting vegetation reestablishment. (Agee 1998; Baker 2009)

Regular cycles of fire occurrence and the resulting vegetation response, or fire regimes, can be characterized by the following general vegetation community types. LANDFIRE’s BpS dataset defines fire regimes and their spatial location based on environmental site potential, models of vegetation succession, and an approximation of the historical disturbance regimes, which include fire, insects and disease, drought, and others. These results are compared with the species composition, structural stage, and amount of canopy closure of vegetation present on the landscape today, defined by LANDFIRE’s Existing Vegetation dataset (Appendix B, Table B-1).

The desired conditions listed in the following sections are based on an analysis of the historical range of variation for key ecosystem characteristics and the methods used by Huago et al. 2015. This analysis provides an understanding of how ecosystems are dynamic and change over time in a manner that is resilient to perturbations and disturbance. As such, the historical range of variation is a guide to understanding how to restore or maintain an ecosystem’s structure and function that will enable it to persist into the future (Keane et al. 2009). Although the historical range of variation is the underpinning, desired conditions also represent an integration of additional factors such as existing or anticipated human use patterns, potential future climate conditions, resiliency to future disturbances, wildlife habitat needs, and ecosystem services that may be desired (such as the reduction of wildfire hazard or production of timber for harvest).

Restoring or maintaining forested systems in the project area based on the historical range of variation will also result in varying tree size classes, which provide habitat for a diversity of wildlife, the continued recruitment of snags and coarse woody debris, and the presence of old forest trees over time. Landscape-level persistence of old forest is provided through a mosaic of forest stands of varying younger ages to replace old forest when it is removed by a stand-replacing event. Large trees and legacy trees are represented and distributed across the landscape in amounts sufficient for restocking and to provide habitat for dependent wildlife.

Coarse woody debris and dead (snags) and dying trees are present; they vary in amount, size, density, species, and stages of decay. These features aid nutrient cycling and maintaining water quality, build soils, and help retain soil moisture. They provide critical habitat for dependent wildlife for nesting, sheltering, foraging, and communicating to proclaim territories and attract mates. Large features provide the greatest ecological and wildlife benefits; their importance is heightened by being naturally uncommon on the landscape.

Prescribed fire and thinning treatments can be used to restore the fire regime and thereby the function of these vegetation communities. For those areas that are within the historical fire regime, prescribed fire and thinning treatments may also be needed to maintain those conditions. Treating these acres within the project area will result in plant communities that contain a mosaic of vegetation conditions, age classes, and understory structures. This, in turn, benefits the wildlife species that depend on those habitats and contributes to the health and resiliency of the ecosystem. Multiple entries or treatments in varying stages over time may be needed to move fire regimes toward desired conditions.

The objectives and under what prescription each treatment will be conducted will be determined at the stand, unit, or site-specific level. The following section provides a general description of each vegetation community in the project area, its historical fire regime, and its stand characteristics. It is to be used as a guide to establish where and what types of treatment would be most appropriate to meet the project’s goals of vegetation restoration and maintenance.
This section also serves as a communication tool between specialists, stakeholders, and land managers. While this document in and of itself is not a comprehensive management guide, when combined with the other identified resources, it provides a site-specific approach to planning, analysis, and implementation that can be efficiently and effectively applied across large landscapes.

Forested Vegetation Types

Upper Subalpine Forest/Whitebark Pine

General Description

Generally occurring in upper timberline conditions, this group makes up 17 percent of vegetation present on the Salmon-Challis NF. These vegetation communities range from nearly uniform stands of five-needled pines on the harshest, highest elevation sites, to mixed species stands that include shade-tolerant firs. Historically, whitebark pine generally dominated on southerly aspects, while northerly aspects were dominated by subalpine fir and Engelmann spruce. Lodgepole pine may be present as an early succession species.

Historical Fire and Disturbance Regimes

Historically, fires were primarily long interval (100 to 200 years or more) that burned with both mixed and stand-replacing severities. Ignitions are frequent due to lightning, though fires seldom carry due to the lack of fuel from the slow-growing vegetation. Individual tree torching is more common. Nonlethal surface fires may dominate where continuous light fuel loading (i.e., grasses) exist, but would typically be small. Fires range in size from individual trees to hundreds of acres; topography and continuity of fuel beds influence fire spread, resulting in a patchy mosaic at fine, mid, and coarse scales (LANDFIRE 2019).

Current Conditions

LANDFIRE data indicate that 80 percent of this vegetation type has experienced moderate to high departure from historical conditions (LANDFIRE 2019). Fire suppression has resulted in more homogeneity in tree density, where cold, harsh environmental conditions allow. If wildfire extent and severity increase, crown fires may eliminate mature trees across the landscape (Halofsky et al. 2018a and 2018b).

Desired Conditions Following Treatment(s)

Vegetation and the associated fuel conditions are sparse, allowing fire to burn in a patchy mosaic, sustaining high frequencies of natural ignitions, which are common at high elevations. Whitebark pine is represented in multiple age classes. Fire and insects and disease regulate competition from mid- to late-seral species. See the table below for descriptions of stand conditions and their desired distributions across this project area.

Table C-1. Distribution of Successional Classes and Associated Structure and Composition for the Upper Subalpine and Whitebark Pine Group

<table>
<thead>
<tr>
<th>Succession Class</th>
<th>Desired Percentage of Total Acres</th>
<th>Percent Canopy Cover</th>
<th>Dominant Tree Size Class</th>
<th>General Description</th>
<th>Percentage of Project Area ± HRV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early: ALL</td>
<td>24–33</td>
<td>0–100</td>
<td>Less than 4.9 inches diameter at breast height (DBH)</td>
<td>Early succession following moderately long to long interval replacement fires and highly variable mixed-severity fires</td>
<td>+11%</td>
</tr>
</tbody>
</table>


Recommended Vegetation Treatment(s)

This vegetation group is moderately departed primarily due to large fires in recent years. This has resulted in an overrepresentation of the early succession class and underrepresentation of the mid closed and open classes (Table C-1). Considering the longer fire return intervals and slower growth rates for this vegetation type, natural recovery and regeneration of these areas is recommended for all succession classes at the project scale. At mid and fine scales, there are likely areas in which a patchy mosaic is needed for the overall function of higher-elevation species in this group. Once areas that fit this description are identified, stand-level determinations would need to be made as to what type of thinning, hand piling, pile burning, broadcast burning, or combination of treatments would move stands toward those conditions.

White pine blister rust has spread rapidly on the Salmon-Challis NF in whitebark pine stands. Most areas that have been genetically tested for blister rust resistance have had low resistance results. Fire creates new age classes of whitebark pine and reduces stagnating in the stands. The new age classes can create genetic resistance in the stands. Open areas also create opportunities for seed caching from wildlife species; this is an important mechanism for whitebark pine distribution.

The goal in these areas is to design treatments that support the health and resiliency of this species. For example, slash piles or jackpots6 of slash would be placed in areas to minimize the effects from pile burning, jackpot burning, or broadcast burning. In areas where whitebark pine is present, thinning around individual whitebark pine trees (sometimes referred to as daylighting) is recommended to reduce additional stressors and to improve the likelihood for survival for this important species. Where thinning is not feasible, prescribed fire could be used to foster conditions that favor whitebark pine dominance, with consideration of the fine and mid-scale mosaic patterns important for this group.

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**Lower Subalpine Forest**

**General Description**

This group makes up 14 percent of vegetation present in the project area. Lodgepole pine, subalpine fir, and Engelmann spruce were historically the dominate tree species. Lodgepole pine comprises a greater component on

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6 A prescribed fire to deliberately burn natural or modified concentrations (jackpots) of wildland fuels under specified environmental conditions, which allows the fire to be confined to a predetermined area and produces the fireline intensity and rate of spread required to attain planned resource Management Objectives.
typical drier sites and exists in even-aged stands on poor, harsh sites. At high elevations and southerly aspects, whitebark pine may occur, while aspen and Douglas-fir may be early seral components at lower elevations.

**Historical Fire and Disturbance Regimes**

High-severity or stand-replacing fires favor lodgepole pine regeneration if serotinous cones are present. Some large, thick-barked Douglas-fir trees often survive fires severe enough to kill the lodgepole pine, ensuring its presence in future stands. Spruce or subalpine fir will dominate the site in the absence of fire. This group historically experienced mixed and stand-replacement fires at intervals of 100 to 400 years, depending on site conditions and climatic influences. Lightning strikes were frequent but most often resulted in small, patchy spot fires.

Fire behavior in this group is strongly related to climatic cycles. Long-term changes in climate, as well as short-term seasonal changes, affect the frequency of fire in this system. These also interact with elevation and site conditions, resulting in a large-scale mosaic of patchy, stand-replacement fires over a period of hundreds of years (LANDFIRE 2019).

**Current Conditions**

Both fire occurrence and insects and disease epidemics in recent decades have influenced the majority of this group being categorized as having low departure from historical conditions, as well as the longer intervals for fire occurrence (LANDFIRE 2019). Spruce beetle and mountain pine beetle have also influenced stand structure, species composition, and stand density. Large-scale insect infestations create large patches of early seral conditions and/or create conditions that lead to large, stand-replacement fires (LANDFIRE 2019). Crown fires also have the potential to eliminate mature trees across the landscape; bark beetles may also become a stressor for Engelmann spruce (Halofsky et al. 2018a and 2018b).

**Desired Conditions Following Treatment(s)**

Vegetation and the associated fuel conditions allow periodic mixed and stand-replacement fires to burn in a patchy mosaic, such as at the mid to fine scale. Spruce beetle and mountain pine beetle influence stand structure, species composition, and stand density. Fire and insect and disease infestations occur in amounts and patch sizes that contribute to resilient stand conditions. See the table below for descriptions of stand conditions and their desired distributions across this project area.

**Table C-2. Distribution of Successional Classes and the Associated Structure and Composition for the Lower Subalpine Group**

<table>
<thead>
<tr>
<th>Succession Class</th>
<th>Desired Percentage of Total Acres</th>
<th>Percent Canopy Cover</th>
<th>Dominant Tree Size Class</th>
<th>General Description</th>
<th>Percentage of Project Area ± HRV (mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early: ALL</td>
<td>10–23</td>
<td>0–100</td>
<td>Less than 4.9 inches DBH</td>
<td>Early seral stage after long-interval replacement fire. Douglas-fir may be present.</td>
<td>+16%</td>
</tr>
<tr>
<td>Mid: Closed</td>
<td>38–48</td>
<td>41–100</td>
<td>5.0 – 19.9 inches DBH</td>
<td>High-density lodgepole pine forest with spruce-fir mid story</td>
<td>-31%</td>
</tr>
<tr>
<td>Mid: Open</td>
<td>12–19</td>
<td>0–40</td>
<td>5.0 – 14.9 inches DBH</td>
<td>Low-density, small- to medium-sized trees. Primarily occurs after mixed-severity fire, pathogen outbreak, or drought. Douglas-fir may be present.</td>
<td>-2%</td>
</tr>
</tbody>
</table>
### Recommended Vegetation Treatment(s)

Most of this vegetation group’s low departure rating is primarily due to insect and disease infestations and large fires that have been similar to the range of conditions historically measured at the landscape or project scale. The exception is some overrepresentation of stands in the mid closed succession class (Table C-2). Considering the large areas that have been stand replaced in recent decades, regeneration of these areas is generally recommended for all succession classes at the project scale. At mid and fine scales, there are likely areas where thinning or burning, or both, should be used to enhance the patchy mosaic needed for the overall function of dominant species in this group. Stand-level determinations would need to be made as to what type of thinning, hand piling, pile burning, broadcast burning, or combination of treatments would move those stands toward desired conditions.

Where whitebark pine or aspen is present, refer to the sections in this guide that recommend treatments for those species.

### Douglas-fir Forest

#### General Description

This group makes up 19 percent of vegetation present in the project area. The Douglas-fir group generally ranges from the lower foothills immediately above grasslands and shrublands, with the upper elevation bordering dry subalpine fir. Stands are typically open and dominated by Douglas-fir. Lodgepole pine can codominate on cool sites.

#### Historical Fire and Disturbance Regimes

Since this type is dominated by mixed fires, patches tended to be smaller in size, and fire types were generally variable. Fires likely burned thousands of acres at a time with a mix of burn severities. Evidence of naturally occurring fires in pure Douglas-fir stands in the Salmon Mountains and Frank Church Wilderness suggests that at least 15 to 20 percent of fires in this group historically burned under low severity (LANDFIRE 2019).

#### Current Conditions

Ninety-seven percent of this vegetation type has experienced moderate to high departure from historical conditions (LANDFIRE 2019). This is primarily due to missed fire cycles, overcrowded stands, and interactions from several different insect and disease epidemics. Douglas-fir increases in canopy density in the absence of fire disturbance.

#### Desired Conditions Following Treatment

Vegetation and the associated fuel conditions allow for regular occurrences of mixed-severity fire, with periodic stand-replacement fires, which burn in a fine-scale, patchy mosaic, such as in small patch sizes. Spruce beetle and
mountain pine beetle influence stand structure, species composition, and stand density. Fires and insect and disease infestations occur in amounts and patch sizes that contribute to resilient stand conditions. See the table below for descriptions of stand conditions and their desired distributions across this project area.

Table C-3. Distribution of Successional Classes and the Associated Structure and Composition for the Douglas-fir Group

<table>
<thead>
<tr>
<th>Succession Class</th>
<th>Desired Percentage of Total Acres</th>
<th>Percent Canopy Cover</th>
<th>Dominant Tree Size Class</th>
<th>General Description</th>
<th>Percentage of Project Area ± HRV (mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early: All</td>
<td>10–23</td>
<td>0–100</td>
<td>Less than 4.9 inches DBH</td>
<td>Dominated by grasses and seedling and sapling-sized Douglas-fir or lodgepole pine, or both</td>
<td>+11%</td>
</tr>
<tr>
<td>Mid: Closed</td>
<td>11–28</td>
<td>41–90</td>
<td>5.0–9.9 inches DBH</td>
<td>Relatively dense pole and medium-sized Douglas-fir or lodgepole pine. The understory is open.</td>
<td>-16%</td>
</tr>
<tr>
<td>Mid: Open</td>
<td>18–37</td>
<td>0–40</td>
<td>5.0–9.9 inches DBH</td>
<td>Open poles and medium-sized Douglas-fir, lodgepole pine, or limber pine with patchy graminoid cover and dispersed shrubs</td>
<td>-29%</td>
</tr>
<tr>
<td>Late: Open</td>
<td>18–30</td>
<td>0–40</td>
<td>10 inches or greater DBH</td>
<td>Open canopy of large to very large Douglas-fir and medium-large-sized lodgepole pine and/or limber pine with a graminoid and sparse shrub understory</td>
<td>+3%</td>
</tr>
<tr>
<td>Late: Closed</td>
<td>6–21</td>
<td>41–90</td>
<td>10 inches or greater DBH</td>
<td>Old multi-aged stands dominated by Douglas-fir, sometimes with lodgepole pine present. Sparse understory.</td>
<td>+29%</td>
</tr>
</tbody>
</table>

Recommended Vegetation Treatment(s)

Most of this vegetation group is at a moderate departure rating due in part to insect and disease infestations and large fires over the last several decades. This is reflected in the overrepresentation of the early succession class and underrepresentation in the mid closed and open classes at the coarse scale. Natural regeneration of these areas is generally recommended for these succession classes at this project’s scale.

A need for restoration exists in stands found within the late closed succession class and especially in areas where large, continuous patches of this condition exist. Thinning and prescribed fire are recommended to reduce ladder fuels in the understory that heighten the potential for crown fire occurrence and the potential for large, stand-replacing fires. Both of these would have negative effects on the ecosystem function and resiliency of this group. In dense stands, thinning may need to be done prior to any broadcast burning, in order to achieve desired conditions.

At mid and fine scales there are likely areas in which a patchy mosaic is needed for the overall function of the dominant species in this group, to enhance fuel breaks to protect older stands and large and legacy trees, and/or to enhance or protect a stand with merchantable timber. Stand-level determinations would need to be made as to what type of thinning, hand piling, pile burning, broadcast burning, or combination of treatments are needed to move stands toward desired conditions.

Douglas-fir/Ponderosa Pine Forest

General Description

This group makes up 10 percent of vegetation present in the project area. It is generally found in the montane zone on well-drained, thin soils and relatively warm sites that can range from nearly flat to steep slopes on all
aspects. Ponderosa pine is generally the dominant species on southerly aspects and drier sites, whereas Douglas-fir dominates on northerly aspects. Southerly aspects support relatively open stands while northerly aspects support more closed stands.

**Historical Fire and Disturbance Regimes**

Historically, both surface and mixed-severity fires occurred at varying intervals ranging from 10 to 80 years, with only occasional stand-replacement fires. Resulting fire effects depended on elevation and site conditions. Insects and disease also play an important role, especially in the absence of fire (LANDFIRE 2019).

**Current Conditions**

Two percent of this vegetation type has experienced moderate to high departure from historical conditions (LANDFIRE 2019). This is due to altered fire cycles and recent impacts of insect and disease infestation.

Most species in this dry forest type are expected to be resilient during long periods of drought; however, fire, insect, and climate interactions could be a stressor on this group and result in a change in species arrangement and composition (Halofsky et al. 2018a and 2018b).

**Desired Conditions Following Treatment**

Vegetation and the associated fuel conditions allow for regular occurrences of both surface and mixed-severity fire, with only occasional stand-replacement fires that burn in a fine-scale, patchy mosaic, such as in small patch sizes. Fires and insect and disease infestations occur in amounts and patch sizes that contribute to resilient stand conditions. See the table below for descriptions of stand conditions and their desired distributions across this project area.

**Table C-4. Distribution of Successional Classes and the Associated Structure and Composition for the Ponderosa Pine/Douglas-fir Group**

<table>
<thead>
<tr>
<th>Succession Class</th>
<th>Desired Percentage of Total Acres</th>
<th>Percent Canopy Cover</th>
<th>Dominant Tree Size Class</th>
<th>General Description</th>
<th>Percentage of Project Area ± HRV (mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early: ALL</td>
<td>5–14</td>
<td>0–100</td>
<td>Less than 4.9 inches DBH</td>
<td>Openings of grass and forbs created by infrequent, stand-replacement fire. Ninebark, ceanothus, elk sedge, and pine grass commonly dominate the understory.</td>
<td>+17%</td>
</tr>
<tr>
<td>Mid: Closed</td>
<td>7–24</td>
<td>61–80</td>
<td>5.0 – 9.9 inches DBH</td>
<td>Closed stand with small- to medium-sized ponderosa pine and Douglas-fir. Mixed fire or pathogens cause a transition to the mid open class.</td>
<td>-12%</td>
</tr>
<tr>
<td>Mid: Open</td>
<td>21–36</td>
<td>0–60</td>
<td>5.0 – 9.9 inches DBH</td>
<td>Medium diameter trees dominate. Surface fires, mixed fires, and insects will maintain the open condition.</td>
<td>+40%</td>
</tr>
<tr>
<td>Late: Open</td>
<td>21–55</td>
<td>21–60</td>
<td>10 inches or greater DBH</td>
<td>Overstory of large to very large trees. Ponderosa pine and Douglas-fir codominate. Surface fires, mixed fires, and insect epidemics maintain the open condition.</td>
<td>-37%</td>
</tr>
<tr>
<td>Late: Closed</td>
<td>4–17</td>
<td>61–80</td>
<td>10 inches or greater DBH</td>
<td>Old multi-aged stands with an overstory of large to very large trees. Ponderosa pine and Douglas-fir codominate.</td>
<td>-10%</td>
</tr>
</tbody>
</table>
Recommended Vegetation Treatment(s)

Most of this vegetation group is at a moderate departure rating due primarily to large fires over the last several decades. This is reflected in the overrepresentation of the early and mid-open succession classes, and underrepresentation in the mid closed, late open, and late closed classes at the coarse scale. Natural regeneration of these areas is generally recommended for these succession classes at this project’s scale.

At mid and fine scales there are likely areas in which a patchy mosaic is needed for the overall function of the dominant species in this group, to enhance fuel breaks to protect older stands and large and legacy trees, and/or to enhance or protect a stand with merchantable timber. Thinning and prescribed fire are recommended, where needed, to reduce ladder fuels in the understory that heighten the potential for crown fire occurrence and the potential for large, stand-replacing fires. Both of these would have negative effects on the ecosystem function and resiliency of this group. In very dense stands, thinning may need to be done prior to any broadcast burning in order to achieve desired conditions. Stand-level determinations would need to be made as to what type of thinning, hand piling, pile burning, broadcast burning, or combination of treatments are needed to move stands toward desired conditions.

Ponderosa Pine Savannah

General Description

This group makes up roughly 6 percent of the vegetation in the project area. These stands typically occur on hot, dry, south and west-facing slopes at lower elevations with well-drained soils and gentle to moderately steep slopes. Frequent natural fires historically promoted a grass-dominated understory with sparse shrubs and a ponderosa pine overstory. Douglas-fir and Rocky Mountain juniper may occur as minor individuals. Common snowberry, antelope bitterbrush, and chokecherry are important shrubs, and mountain mahogany may also occur on rocky outcrops. Grasses may include Idaho and rough fescue. More mesic shrubs may be present if it is a wetter habitat type that historically maintained an open stand through frequent fire.

Historical Fire and Disturbance Regimes

Frequent, nonlethal surface fires were historically the dominant disturbance factor, occurring every 15 to 30 years on average. Mixed-severity fires also likely occurred about every 50 years, while stand-replacement fires likely occurred in small patches up to a few hundred acres every 300 to 700 years. This resulted in a mosaic of uneven-aged stands across the landscape (LANDFIRE 2007).

Current Conditions

LANDFIRE data indicate 99 percent of this vegetation type has experienced moderate to high departure from historical conditions (LANDFIRE 2019). This is largely due to altered fire cycles, invasive species, and insect infestations. A significant increase in cheatgrass has reduced the native plant diversity and increased the flammability of the understory, which can lead to more frequent fire cycles than this system evolved with. If insect outbreaks are more prevalent in a warmer climate, they could increase stress in pine species, especially during drought (Halofsky et al. 2018a and 2018b).

Desired Conditions Following Treatment(s)

Vegetation and the associated fuel conditions allow for regular occurrences of primarily surface fire, some mixed-severity fire, and very occasional stand-replacement fires that burn in a fine-scale, patchy mosaic, such as in small patch sizes. Fires and insect and disease infestations occur in amounts and patch sizes that contribute to resilient stand conditions. See the table below for descriptions of stand conditions and their desired distributions across this project area.
Table C-5. Distribution of Successional Classes and the Associated Structure and Composition for the Ponderosa Pine Savannah Group

<table>
<thead>
<tr>
<th>Succession Class</th>
<th>Desired Percentage of Total Acres</th>
<th>Percent Canopy Cover</th>
<th>Dominant Tree Size Class</th>
<th>General Description</th>
<th>General Description</th>
<th>Percentage of Project Area ± HRV (mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early: ALL</td>
<td>2–15</td>
<td>0–100</td>
<td>Less than 4.9 inches DBH</td>
<td>Grass, forbs, and seedlings and saplings dominate, with 25 to 75 percent grass cover. Dispersed, large-diameter, fire remnant ponderosa pine may also be present.</td>
<td>+48%</td>
<td></td>
</tr>
<tr>
<td>Mid: Closed</td>
<td>1–18</td>
<td>31–100</td>
<td>5.0 – 9.9 inches DBH</td>
<td>Closed stand with small- to medium-sized ponderosa pine. Includes high-density, stunted stands.</td>
<td>+11%</td>
<td></td>
</tr>
<tr>
<td>Mid: Open</td>
<td>9–31</td>
<td>0–30</td>
<td>5.0 – 9.9 inches DBH</td>
<td>Medium-diameter trees with open patches due to recent fire, drier site conditions, or insect and disease occurrence.</td>
<td>+7%</td>
<td></td>
</tr>
<tr>
<td>Late: Open</td>
<td>30–76</td>
<td>0–40</td>
<td>10 inches or greater DBH</td>
<td>Open understory with an overstory of large to very large ponderosa pine and isolated Douglas-fir.</td>
<td>-56%</td>
<td></td>
</tr>
<tr>
<td>Late: Closed</td>
<td>5–17</td>
<td>41–100</td>
<td>10 inches or greater DBH</td>
<td>High-density, multi-storied ponderosa pine-dominated stand; Douglas-fir regeneration on some sites. Patches of various size classes are distributed within this class.</td>
<td>-11%</td>
<td></td>
</tr>
</tbody>
</table>

Recommended Vegetation Treatment(s)

Most of this vegetation group is at a moderate departure rating due primarily to large fires over the last several decades. This is reflected in the overrepresentation of the early and mid-succession classes, and underrepresentation in the late classes at the coarse scale. Natural regeneration of these areas is generally recommended for these succession classes at this project’s scale.

At mid and fine scales there may be some areas in which a patchy mosaic is needed for the overall function of the dominant species in this group, to enhance fuel breaks to protect older stands or large and legacy trees, and/or to enhance or protect a stand with merchantable timber. Thinning and prescribed fire are recommended only where needed to reduce ladder fuels in the understory that heighten the potential for crown fire occurrence and the potential for large, stand-replacing fires. Both of these would have negative effects on the ecosystem function and resiliency of this group. Stand-level determinations would need to be made as to what type of thinning, hand piling, pile burning, broadcast burning, or combination of treatments are needed to move stands toward desired conditions.

Aspen

General Description

These are upland forests and woodlands dominated by aspen and without a significant conifer component (less than 25 percent relative conifer tree cover). Elevations generally range from 5,000 to 10,000 feet, but occurrences can be found at lower elevations in some regions. Conifer will outcompete aspen without disturbance.

Distribution of this ecological system is primarily limited by adequate soil moisture required to meet its high evapotranspiration demand; secondarily, it is limited by the length of the growing season or low temperatures.
Other than riparian habitats, aspen forests support the highest biodiversity in the intermountain west (Kay 1997). Aspen also produces an abundance of livestock and wildlife forage; it also maintains water storage capacity for watersheds. Aspen is not considered a commercial tree species and is not targeted for harvest on the Salmon-Challis NF.

**Historical Fire and Disturbance Regimes**

Replacement and surface fire were historically common. Disturbance effects varied from clone to clone. Many aspen clones situated on steep slopes are prone to disturbance caused by avalanches and mud or rockslides. Riparian aspen are prone to flooding and beaver clear-cutting. Conifers, where codominant in aspen stands, would experience insect and disease outbreaks every 300 years on average, under pre-settlement conditions (LANDFIRE 2019).

**Current Conditions**

Quaking or trembling aspen was historically a relatively minor component of the forested landscape on the Salmon-Challis NF, covering approximately 48,000 acres (LANDFIRE 2019). The current distribution and condition reflect its tolerance for a wide range of environmental conditions and the influence of land management policies, such as wildland fire suppression, grazing, and state wildlife objectives. Within the project area, aspen tends to occur in small, isolated stands as a seral tree species with conifers or along water courses.

The condition of these stands is generally one of reduced vigor, primarily, to competition from encroaching conifers and the lack of fire. Under a warming climate scenario, aspen may attain increasing dominance. This is because of its ability to sprout vigorously after fire and outcompete other species that are susceptible to drought and fire, especially if there is an increase in wildfire frequency and extent (Halofsky et al. 2018a and 2018b).

**Desired Conditions Following Treatment**

Aspen communities harbor high biodiversity, maintain water storage capacity for watersheds, and offer recreation and scenic value to visitors. There are a wide age and size distribution of aspen, which contribute to habitat and biodiversity. Aspen stands are periodically regenerated through stand-replacing fire events. Conifers are reduced, creating suitable conditions for aspen to thrive in all age classes. Reduced conifer competition on the edge of an aspen patch allows for more light to reach the forest floor. This increases the diversity of grass and forbs, and allows aspen to expand in patch size.

**Recommended Vegetation Treatment(s)**

The fine-scale arrangement of this group on the landscape makes it difficult to measure with satellite imagery, so it is important to consider it at the mid and fine scales in the project area. When there is greater than 25 percent conifer understory and overstory present in the aspen clone, conifer trees are thinned, reducing competition to residual aspen trees. Conifer trees could be removed if economically feasible. Commercial- or noncommercial-sized trees, or both, may remain where felled, if needed to hinder browse pressure on rejuvenating aspen seedlings by livestock and wildlife. If fire is not used in the clone, soil could be ripped or burned to stimulate aspen suckering or to provide a patchwork of exposed mineral soil suitable for natural regeneration from seed. Conifer densities surrounding the aspen patch are thinned. Legacy trees are retained where present, along with large, coarse, woody debris and snags.

Prescribed fire may be used on its own or in combination with thinning to reset succession, stimulate aspen regeneration, and favor aspen dominance. Application of prescribed fire in the spring when conditions are generally moist can kill smaller-sized encroaching conifers and generally preclude total consumption of large, woody material and duff. Burning in the fall allows for greater consumption of ground and ladder fuels and greater exposure of mineral soil to stimulate aspen regeneration. This results in reducing conifers of larger and smaller sizes and stimulating clonal sprouts.
MOUNTAIN BIG SAGEBRUSH, WYOMING BIG SAGEBRUSH, BASIN BIG SAGEBRUSH, AND DWARF SAGEBRUSH

GENERAL DESCRIPTION

All sagebrush groups combined constitute 19 percent of the vegetation in the project area.

Basin and Wyoming big sagebrush are found at 3,000 to 7,000 feet in elevation on deep, well-drained, non-saline, alluvial soils. Basin big sagebrush generally dominates in lower elevations with deepest soils, while Wyoming big sagebrush generally dominates alluvial fans at mid elevations. Mountain big sagebrush is found between 4,500 and 10,500 feet in elevation on well-developed, dark, organic surface horizons in moderately deep to deep, well-drained soil of loam, sandy loam, clay loam, or gravelly loam textural classes. It may also occur on more shallow, coarse-textured soils at higher elevations. Dwarf sagebrush generally occurs at elevations between 3,500 and 10,000 feet on shallow soils or convex slopes. The small amount of mostly juniper woodlands represented on the Salmon-Challis NF is also part of this group (LANDFIRE 2019).

Sagebrush communities are quite diverse. They support many grass and forb species that provide important habitat and forage to wildlife, such as elk, mule deer, pronghorn antelope, greater sage-grouse, and others. These types generally represent both winter and spring habitats for wildlife.

HISTORICAL FIRE AND DISTURBANCE REGIMES

Fire, climate, and insects all played a role in the disturbance history of these groups. The dry nature and inherently low productivity of these plant communities generally limited fire occurrence. Periodic drought may also have reduced the density and cover of sagebrush by reducing canopy size and killing individual plants (LANDFIRE 2019).

The fire return intervals for these groups are highly variable. Fires may have occurred as frequently as every 30 years to as infrequently as every 200 years. The resulting burn pattern was generally patchy. However, while fire ignition and spread in sagebrush are considered largely a function of understory plants, live fuel moisture in shrubs appears to be an important local control on the resulting burn pattern. Stand-replacing wildfires historically occurred in these groups when successive years of above-average precipitation were followed by dry conditions, high winds, and dry lightning. Recovery rates for shrub canopy cover vary widely in this type, depending on post-fire weather conditions, the abundance of resprouting shrubs, and the size and severity of the burn (LANDFIRE 2019).

CURRENT CONDITIONS

Much of this vegetation type (96 percent) has experienced medium to high departure from historical disturbance cycles (LANDFIRE 2019). However, the encroachment of conifer species, altered wildfire regimes, and invasive plant species are significant stressors to this group.

DESIRED CONDITIONS FOLLOWING TREATMENT

Sagebrush communities are represented across the landscape within a broad range of environments, successional states, and community types. Sagebrush landscapes consist of variable ratios of shrub canopy cover that support habitat needs for known sagebrush-obligate wildlife and plant species. In greater sage-grouse seasonal habitat, 70 percent or more of sagebrush communities have 10 to 30 percent sagebrush canopy cover, with less than 10 percent conifer canopy cover. Additional desired conditions for greater sage grouse based on seasonal habitat requirements are included in Attachment A to the Greater Sage Grouse Record of Decision: Idaho and Southwest Montana, Nevada, and Utah (Forest Service 2015b).
Recommended Vegetation Treatment(s)

Prescribed burning in sagebrush habitat would adhere to the Desired Conditions outlined table 1 of the Greater Sage-grouse Idaho and Southwest Montana Plan Amendment (Forest Service 2015b). The project would need to identify where prescribed burning is necessary to move the habitat towards desired conditions and why alternative techniques were not selected.

Other Vegetation Types

Alpine Vegetation Group

General Description

Alpine communities occur above timberlines at elevations greater than 9,500 feet; they include dwarf-shrublands, fell-field, alpine turf, and sparsely vegetated plant communities. While alpine habitats represent less than 1 percent of land area within the state of Idaho, this plant community association is well represented on the Salmon-Challis NF; therefore, it is considered unique and of “significant conservation value” (Idaho Department of Fish and Game 2017). These habitats support species such as black rosy-finch, hoary marmot, mountain goat, and wolverine, which are species that are uniquely adapted to harsh climatic conditions. Snowpack from alpine catchments is critically important to maintaining favorable flow regimes in the rivers and streams on the Salmon-Challis NF.

Alpine communities are considered to exhibit good ecological integrity. This is because this habitat type exists primarily in wilderness, roadless, and otherwise remote areas. The sparse arrangement of this group on the landscape makes it difficult to measure with satellite imagery, so it is important to consider it at the mid and fine scales in the project area.

Historical Fire and Disturbance Regimes

Vegetation in this group is controlled by snow retention, wind desiccation, permafrost, and a short growing season. Dry summers associated with major drought years favor grasses over forbs, whereas wet summers can result in a more diverse mixture of forbs and grasses. Avalanches on stepper slopes where soil accumulated can cause infrequent soil slips, which expose bare ground. Lighting storms are infrequent at these high elevations; therefore, very rare instances of replacement fires historically burned in very small patches in this group (LANDFIRE 2019).

Current Conditions

The greatest risk to this plant community is its "low adaptive capacity" to stressors associated with shifts in climate (Idaho Department of Fish and Game 2017). Under a warming climate scenario, the composition and distribution of alpine ecosystems will be affected by decreasing snowpack and altering plant vigor and regeneration. Specific effects will depend on vulnerability thresholds of diverse species and the rate and magnitude of changes over time. Some species may be able to persist or migrate to suitable habitat, but the lower extent of some communities will be compromised by tree establishment (Halofsky et al. 2018a and 2018b).

Desired Conditions

Alpine landscapes consist of a mosaic of plant communities that are strongly influenced by topography, geology, aspect, snow accumulation and persistence, wind exposure, rodent activity, soil moisture, temperature, and other geomorphic features that help form habitable niches. An intact vegetation cover contributes to alpine ecosystems’ capture of snow and storage of runoff, which helps sustain primary watershed features. Fire severity and spread are limited due to the short duration without snow cover and limited fuel loadings.
Recommended Vegetation Treatment(s)
Thinning and prescribed fire treatments are not recommended in these areas, based on the desired conditions listed here.

Curl-leaf Mahogany/Shrub Mix

General Description
This group makes up 4 percent of vegetation present in the project area. Curl-leaf mahogany is a unique habitat type usually found on upper slopes and ridges between 5,000 and 10,500 feet in elevation on relatively shallow soils with fractured bedrock below. Codominant species can include rabbitbrush, antelope bitterbrush, mountain big sagebrush, or black sagebrush.

The Idaho State Wildlife Action Plan identifies curl-leaf mahogany as highly palatable to bighorn sheep, moose, elk, and mule deer and an important winter cover for mountain goat, bighorn sheep, and other wild ungulates (Idaho Department of Fish and Game 2017). The same plan identifies curl-leaf mahogany on the Salmon-Challis NF as in fair condition.

Historical Fire and Disturbance Regimes
Historically, a mix of fire severities influenced this group in irregular patch sizes and patterns over long time frames (100 to 200 years).

Current Conditions
Altered fire cycles pose the greatest risk to this important habitat component. Curl-leaf mahogany is fire intolerant; therefore, excluding fire completely results in over-decadent and unhealthy stands. Dry conifer types expanding into curl-leaf mahogany can cause uncharacteristically high-intensity fires with high mortality rates; the stands would be slow to recover from these fires. Invasive annual grasses also threaten this rare and highly valuable habitat (LANDFIRE 2007).

Desired Conditions
Curl-leaf mahogany is a unique and valuable plant community occurring in small to large, scattered patches on upper slopes, steep canyons, and rocky outcrops. It is well adapted to relatively shallow soils with fractured bedrock below. This group contains a balance of structural stages, sizes, and ages.

Recommended Vegetation Treatment(s)
The fine-scale arrangement of this group on the landscape makes it difficult to measure with satellite imagery, so it is important to consider it at the mid and fine scales within the project area. Thinning and prescribed fire treatment objectives in neighboring stands where conifers are encroaching will need to consider the slow recovery rates of curl-leaf mahogany. Prescribed fire and thinning are generally not recommended in these areas.

Deciduous Shrubland

General Description
This group comprises various mixes of shrubs that typically occupy draws and foothills in the transition zone between grasslands/shrublands and forests; it ranges widely in elevations (3,000 to 9,000 feet).

Historical Fire and Disturbance Regimes
Fire regimes of adjacent vegetation types typically drove the fire frequency and severity for this group. The average fire return interval ranges from less than 60 to 100 or more years. Drought, insects and disease, and native
grazing also affect this group. There is significant variation in plant response to disturbances within this group, depending on site conditions and other factors.

**Recommended Vegetation Treatment(s)**

The sparse arrangement of this group on the landscape makes it difficult to measure with satellite imagery, so it is important to consider it at the mid and fine scales in the project area. Thinning and prescribed fire treatment objectives in neighboring forested stands or non-forested areas will need to consider their impacts on the overall diversity and function of this group.

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**Grasslands**

**General Description**

The grassland vegetation group is highly variable and makes up 1 percent of the vegetation in the project area. Idaho fescue and bluebunch wheatgrass are the predominant grasses on the Salmon-Challis NF, but a variety of cool-season herbaceous, grass-like plants may also be present. Bighorn sheep use grasslands to graze on preferred grasses and forbs, but may seasonally shift to subsist on shrubs. Grassland and shrubland habitats provide nesting, brood-rearing, and foraging sites for greater sage-grouse, short-eared owl, burrowing owl, and long-billed curlew (Idaho Department of Fish and Game 2017).

Black rosy-finch uses open slopes of intermountain valleys during winter storms or while the higher country is covered in snow (Johnson 2002). The wide variety of grasses, forbs, and shrubs in this vegetation group also provides abundant nectar and pollen resources for a diverse assemblage of pollinator species.

**Historical Fire and Disturbance Regimes**

Most species in this type are fire adapted, with a majority of areas historically responding favorably to replacement fire types, generally every 10 to 30 years in frequency. Where this group existed within forested ecosystems, fire frequency will be strongly influenced by the adjacent forest's fire regime.

**Current Conditions**

This vegetation type may have increased in cover by as much as threefold from pre-European settlement. This is likely a result of stand-replacing wildland fires on the Salmon-Challis NF. Perennial forbs, such as spotted knapweed, and annual grasses, such as cheatgrass, have colonized some areas of native grasslands and pose a threat to this important habitat. Site disturbances, such as high-intensity fire or improper livestock grazing, can reduce native plant vigor. This problem is exacerbated in areas of lower precipitation where nonnative cheatgrass is able to outcompete native grasses by using late fall and early spring moisture while native grasses remain dormant. Stressors, such as prolonged drought, longer growing seasons, and uncharacteristic fire frequency, may elevate the risk of a change in species composition and function in grassland types (Halofsky et al. 2018a and 2018b).

**Desired Conditions**

Grassland plant communities have a high diversity of tall and medium height, native perennial cool and warm season grasses, and short grasses. Subshrubs and shrubs may be present with minor cover. There is a variety of forbs in varying amounts. The diversity of plant species present allows for drought tolerance. Individual species can vary greatly in the amount of production depending on growing conditions. Vegetation typically has strong and robust root systems that allow production to increase considerably with favorable growing conditions.

This vegetation type provides for soil stability and a functioning hydrologic cycle. Plant litter is a common component and is available for soil building and moisture retention. There is very little movement of plant litter off-site with natural plant mortality typically being low. Biological soil crusts are found on almost all soil types;
however, they are more commonly found in arid areas where plant cover is low and plants are more widely spaced. Bare ground is present because of the warm, dry nature of these sites, but at low amounts.

**Recommended Vegetation Treatment(s)**

Prescribed fire or thinning should be used to reduce conifer encroachment and competition in areas where site conditions allow for the persistence or potential expansion of these groups, in order to maintain or restore conditions within their historical range of variability. Invasive species and the likelihood of their spread are considered carefully prior to treating these areas, as described in the Salmon-Challis NF Invasive Plant Treatment Final Environmental Impact Statement (Forest Service 2015a).

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**Subalpine/Upper Montane Riparian**

**General Description**

This ecological system represents the combination of numerous riparian types occurring in the higher elevations or upper montane/subalpine zones (4,900 to 11,500 feet). This ecological system encompasses a broad array of riparian species. This system is highly variable and generally consists of willow and other shrubs, sedges, and herbaceous vegetation or conifers. This ecological system typically exists as relatively small, linear stringers, but it can occupy relatively wide and flat valleys.

**Historical Fire and Disturbance Regimes**

Flooding events and the availability of water during drier periods are the major influences on this system, as a function of slope. Five-year flood events maintain vegetation but do not scour it, whereas 100-year events scour and reset succession to early development, depending on the vegetation. Flat-valley-bottom systems store and release water slowly throughout the growing season; in contrast, narrow, steep systems have little to no lateral floodplain development, and water is transported downstream rapidly through step-pool channels. In the latter situation, larger materials (boulders, bedrock, and large, woody debris) typically armor the banks and maintain channel form, even during larger flooding events. Vegetation is less critical in these systems; however, it is the primary armoring agent in low-gradient, valley-bottom systems.

The moisture associated with riparian areas promotes a lower fire frequency compared with adjacent uplands, and rapid recovery from fire events. Wet meadow types seldom burn. In riparian systems, the pre-burn herbaceous plant community is not permanently destroyed and recovers rapidly. Recovery is possible within a single growing season. Woody species (i.e., aspen, Salix spp., and occasionally cottonwood species) can be top killed, but they generally resprout within a short period. In systems with conifer, post-fire establishment is from seed. Willow regenerates from seed if bare, wet mineral soil is present (i.e., stream bars), but it also sprouts vigorously after fire.

Older vegetation experienced fire when replacement fires burned the uplands. Surface fire affected the early development class through a combination of replacement fire from uplands and occasional native burning.

**Recommended Vegetation Treatment(s)**

The fine-scale arrangement of this group on the landscape makes it difficult to measure with satellite imagery, so it is important to consider it at the mid and fine scales in the project area. Thinning and prescribed fire treatment objectives in neighboring forested stands or non-forested areas will need to consider their impacts on the overall diversity and function of this group.

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**Montane/Foothill Riparian**

**General Description**

This group occurs within a broad elevation range within the flood zone of rivers and streambanks. Typically this system exists in broad or narrow, linear bands on rocky canyon tributaries and well-drained benches and hillslopes
below seeps and springs. This ecological system occurs as a mosaic of multiple communities that are tree
dominated with a diverse shrub component. Deciduous woody trees can dominate, depending on site conditions.
Generally, the adjacent upland vegetation surrounding this riparian system includes grasslands to forests.

Historical Fire and Disturbance Regimes

This system is dependent on a natural hydrologic regime, especially annual to episodic flooding. Flood events of
increasing magnitude will cause maintenance to stand-replacing disturbances. Beaver historically cropped younger
cottonwoods and willows and frequently influenced the hydrologic regime through construction of dams. Beaver
shows considerable movement along rivers as available trees are felled.

Frequent fire maintains the deciduous shrub component, especially at the lower-elevation range of this group. In
the absence of fire, shade-tolerant conifers will encroach and shade out the deciduous shrubs. Fire intervals may
have ranged from 35 to 150 years, depending strongly on the fire regimes of the surrounding upland vegetation
(Olson and Agee 2005).

Current Conditions

The absence of fire as a structuring agent, coupled with shade-tolerant conifer establishment, can lead to the loss
of shade-intolerant deciduous woody species. In addition, grazing and trampling by domestic and wild ungulates
can shift the composition toward weedy or non-riparian species, or both. The associated bank damage, which
results in head-cutting and incision, can result when ungulate activity removes or damages bank-stabilizing
vegetation. In addition, the loss of beavers, coupled with heavy ungulate use, can shift dominance in these systems
to herbaceous species. Herbaceous noxious weeds, including leafy spurge, tansy, and spotted knapweed, readily
invade and persist in these systems today.

Recommended Vegetation Treatment(s)

The fine-scale arrangement of this group on the landscape makes it difficult to measure with satellite imagery, so it
is important to consider it at the mid and fine scales in the project area. Thinning and prescribed fire treatment
objectives in neighboring forested stands or non-forested areas will need to consider their impacts on the overall
diversity and function of this group.

Dry Meadows

General Description

Dry (xeric) meadows are characterized as non-forested habitats dominated by non-woody plants, such as grasses
and forbs, and having soils that become moderately dry by mid-summer. The sparse arrangement of this group
makes it difficult to measure with satellite imagery, so it is important to consider it at the mid and fine scales in the
project area.

Current Conditions

Dry meadow habitat adjacent to, or surrounded by, forested stands is decreasing in size and openness. Conifer and
shrub species are encroaching from the perimeter and seeding into the interior of these natural openings, which
reduces biodiversity. If this encroachment is not addressed, changes in soil properties will negatively affect
persistance of meadow vegetation.

Desired Conditions

Meadow species would slowly reestablish through seed dispersal and residual seed bank sources, which over time
and space would result in herbaceous diversity within the meadow. The diversity in vegetation composition is
reflective of a properly functioning system. Shrub or tree layers may exist along the meadow perimeter, but they
are generally absent or very sparse within the meadow.
Recommended Vegetation Treatment(s)

Thinning to remove conifer encroachment is recommended, where necessary, to allow for desirable meadow function and species diversity. Trees felled interior to meadows remain on-site for diversity, microsites, and nutrient input. Prescribed fire also is recommended to reduce conifer encroachment, reduce litter, stimulate seed germination, promote establishment and plant growth of meadow vegetation, and limit shrub encroachment.

Wet Meadows

General Description

Wet (mesic) meadows are dynamic systems that provide important food and cover for a diversity of wildlife, including greater sage-grouse. These areas are also essential for working ranchlands. The sparse arrangement of this group makes it difficult to measure with satellite imagery, so it is important to consider it at the mid and fine scales in the project area.

Current Conditions

Conifer and shrub species are encroaching and reducing biodiversity within wet (mesic) meadows. Historically, fire and hydrologic conditions helped maintain the ecotone between meadows and forested stands by killing the conifers. Increased conifer density in the upland and wetlands has lowered the water table and exacerbated conifer encroachment. As conifers establish in meadows, soil conditions beneath their canopies change. This makes seedbeds conducive to establishment of forested species (conifers, shrub, and herb species) and less conducive shrub and herb species common in meadow communities. The longer conifers occupy a site within or adjacent to a meadow, the longer it can take to reestablish meadow species.

Desired Conditions

Meadow species would slowly reestablish through seed dispersal and residual seed bank sources, which over time and space would result in herbaceous diversity within the meadow. The diversity in vegetation composition is reflective of a properly functioning hydrologic system. Water is at or near the surface during most of the growing season following spring runoff. Shrub or tree layers may exist along the meadow perimeter but are generally absent or very sparse within the meadow.

Recommended Vegetation Treatment(s)

Thinning to remove conifer encroachment is recommended, where necessary, to allow for desirable meadow function and species diversity. Trees felled interior to meadows remain on-site for diversity, microsites, and nutrient input. Prescribed fire also is recommended to reduce conifer encroachment, reduce litter, stimulate seed germination, promote establishment and plant growth of meadow vegetation, and limit shrub encroachment.
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