Environmental Assessment

Mosquito Flat
Fuels Reduction Project

Challis-Yankee Fork Ranger District, Salmon-Challis National Forest, Custer County, Idaho

T14N, R16E, SEC 12 & 13; T14N, R17E, SEC 7, 8, 17-20; and T13N, R17E, SEC 3-5, 8 & 9,
Boise Meridian

A general view of MFFR Project Area looking up the Challis Creek Drainage
(J. Fowler, 2015)
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1.0 PURPOSE AND NEED

1.1 Introduction
The Forest Service has prepared this Environmental Assessment (EA) on the potential environmental effects of proposed fuels treatments and related activities in the Salmon River drainage of the Mosquito Flat area (Figure 6) in compliance with the National Environmental Policy Act (NEPA), the Healthy Forest Restoration Act (HFRA) of 2003 and other relevant federal and state laws/regulations. This EA discloses the direct, indirect and cumulative effects and irreversible or irretrievable commitment of resources that would result from the proposed action and alternatives. It is prepared according to the format established by Council of Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500-1508) (Connaughton, 2005). Planning was coordinated with the appropriate state and local agencies, and local federally recognized tribes. Additional documentation, including more detailed analyses of project area resources, tables, figures, and citations may be found in the electronic project record database located on the corporate drive at the Challis Yankee Fork Ranger District in Challis, Idaho. These records are available for public review.

1.2 Background
Crown, ladder and surface fuels in the Mosquito Flat vicinity have increased due to the absence of historical fire occurrence. Current stand conditions predominantly consist of multiple structural layers and high tree densities. This multi-layered conifer structure is replacing the Historical Range of Variation 1(HRV) that consisted of open canopy conditions, resulting in increased tree competition, increased fuel accumulation and a decrease in understory plant diversity and biomass. In response to these conditions this project was designed to implement four vegetative treatment strategies to provide merchantable timber, reduce both surface and canopy fuels, and increase aspen occurrence and vigor while facilitating development of more fire resistant forested tree stands.

The Mosquito Flat project area includes and enhances the Mosquito Flat Wildland Urban Interface (WUI), which has been identified as “at-risk” in the Custer Country Wildland Fire Mitigation Plan, which originates from the National Fire Plan (Figure 10). The area has been designated as high priority for treatment based on the high levels of hazardous fuels and potential for stand replacement wildland fires. Historically about half the forested stands in the project area functioned with non-lethal fire processes. Stand replacing fire occurred in the other half every 100-300 years, with mixed severity understory burns occurring every 25-70 years (Steele, 1994). These mixed severity understory burns have not happened since the 1870s.

Since 1966, 11 wildfires have been suppressed in the project area. All but one of these was suppressed at less than one acre in size. One large fire occurred in 2013 when lighting ignited a fire in mid-July in the Lodgepole Creek drainage east of the project area. The Lodgepole Fire burned a total of 22,750 acres which included 2,065 acres within the project area, primarily within the large tributary drainage to the east of the main stem Challis Creek. This wildland fire incident highlights the ongoing risk of wildfire and need for fuels treatments in and around this area.

1Historical Range of Variation is a description of the change over time and space in the ecological condition of potential natural vegetation types and the ecological processes that shape those types.
1.3 Project Location

The proposed project area is located on the Challis-Yankee Fork Ranger District of the Salmon-Challis National Forest, approximately eight (8) air miles north and west of Challis, Idaho (Figure 6), in the Challis Creek Watershed (Challis and Custer Motorway drainages) and Challis Creek Management Area #21 (Figure 4) as described in the Challis National Forest LRMP (Forest Plan). The project area encompasses or borders portions of Forest Service Road #40080 (Challis Creek), 40091 (Challis Creek Lakes), 40079 (Jeff’s Flat) and 40070 (Custer Motorway). The legal location is described as T14N, R16E, SEC 2, 3, 4, 12, 13; T15N, R16E, SEC 1, 2, 11, 12; and T14N, R17E, SEC 7, 8, 17-20; and T13N, R17E, SEC 3-5, 8& 9 of the Boise Meridian, encompassing 9,630 acres (refer to Figure 7). Primary vehicular access to and from the Mosquito Flat/project area is via Forest Service Roads 40080 and 40070. See Appendix A: Maps for all project maps referenced in this document.

1.4 Purpose and Need for the Proposed Action

The Mosquito Flats project area duff layer, surface, ladder, and canopy fuels have increased on the landscape, along with the occurrence of conifer/sagebrush encroachment and a loss of aspen. The existing situation of high departure from historic conditions has greatly increased the potential for high severity surface fires and uncharacteristic crown fire occurrence. The MFFR project and surrounding area are rated as high risk of losing ecosystem components such as large trees, native grasslands, and fire dependent species. The primary purpose of the proposed action is to reduce surface, ladder and canopy fuel loading, reduce timber stands stocking density, and restore aspen on the landscape, thereby reducing crown fire potential and the occurrence of high severity wildfire in the Mosquito Flat area and moving the forested vegetation toward more sustainable conditions.

The need for the proposed action is driven by goals and desired conditions defined by the Challis National Forest Land and Resource Management Plan (LRMP or Forest Plan) for Challis Creek Management Area #21. According to these plans management will emphasize a “mix of resource activities and opportunities primarily within the resources of timber, range, wildlife, minerals, and dispersed recreation” (Challis National Forest LRMP, Section IV, pp. 1-167). Forest Plan goals also include the enhancement of timber species diversity and age structure, rejuvenation of aspen, the use of prescribed fire for range and wildlife habitat improvements and fuels reduction, the reduction of fire potential in high hazard and high value areas, and the support of local communities through rural community planning development. The MFFR project proposes activities to implement fuels and prescribed fire treatments that adhere to the LRMP direction, as well as all national, regional, and Forest standards and guidelines that apply to the LRMP and the Challis Creek Management Area #21.

1.4.1 Existing Conditions

Current fuel and vegetation conditions in the Mosquito Flats area have departed historic ranges of variability that reflect the disturbance regimes by which ecosystem components in the project area have evolved in. The forested areas in and around the MFFR project area are characterized by relatively homogenous forest vegetation dominated by high conifer tree density and high fuel loadings. Hazardous fuel levels in the project vicinity pose risks to life, adjacent private property, and ecosystem components. The area is identified as a priority area for fuels reduction activities within the Custer County Wildland Fire Mitigation Plan.

This project is proposed in response to the National Fire Plan (NFP), the Custer County Wildland/Urban Interface Fire Mitigation Plan, the overall guidance (goals, objectives, standards and management area direction) of the Challis National Forest Plan, Core Principles, Goals and Actions in the 10-Year Comprehensive Strategy (2001) and Assessment of Ecosystem Components in the Interior Columbia Basin (ICBEMP). Without the proposed actions the forested areas in and around the MFFR project area would remain characterized as relatively homogenous overstocked forest vegetation dominated by high...
conifer tree density with the potential for severe wildfire occurrence across the entire area. These characteristics would continue to pose risk to life, adjacent private property, and ecosystem components. In addition, landscapes after catastrophic wildfire, especially a watershed close to private land and homes, are not a desired future condition outlined in the Forest Plan.

1.4.2 Desired Conditions

The MFFR project is in line with the Forest Service 2007-2012 Strategic Plan’s goals of restoring and sustaining the nation’s forests and grasslands in part by reducing the risk to communities and natural resources from wildfire, and building community capacity to suppress and reduce losses from wildfires (Goal 1, Objectives 1.1 and 1.3). The project is intended to assist further collaborative efforts between the Forest Service and Custer County to implement fuels reductions and fire hazard mitigation measures in the Mosquito Flat WUI area.

This project will also meet multiple Forest Plan management strategies which emphasize timber production, wildlife and fish habitat, range administration and maintenance of water quality (p. IV-167). It will also emphasize aspen rejuvenation, burning, fencing, and water development (p. IV-170), timber species diversity and age structure within Management Area #21, a reduction in fire potential in high hazard, high value areas (9b), and the utilization of prescribed fire to provide for range and wildlife habitat improvements and fuels reduction (9f, IV-29). Desired future conditions consist of restoration and maintenance of healthy, vigorous, sustainable ecosystems, especially in the Douglas-fir, mixed conifer, and aspen habitats; re-introduction of mixed severity burning in the upper elevation habitats; the elimination of some subalpine fir stands encroaching into stands of whitebark pine and conifers encroaching into sagebrush/grassland habitat.

1.5 Proposed Action

Alternative 2 would reduce fuel loadings and improve stand health and resilience across 7,565 acres through a mix of implementation techniques that predominately includes prescribed burning. Felling and piling of small diameter trees with chainsaws and felling and harvesting of small and large diameter trees using mechanized equipment such as feller-bunchers and rubber tired skidders would occur where necessary to meet project specific objectives of reducing fuel loadings and improving stand health.

These treatment areas are located in the head of the Challis Creek drainage from the area west and north of Mosquito Reservoir to upper basin containing Challis Creek lakes. The mechanical treatments are focused in the area due south of the reservoir outside of designated roadless area. The mechanical treatments include timber harvest and/or hand thinning with chain saws and will be utilized in the Thinning Cut, Aspen Restoration Cut, and Overstory Removal Cut treatments listed in Table 1 to achieve the desired conditions. A summary of the method of treatment for the Thinning Cut, Aspen Restoration Cut and Overstory Removal Cut activities are listed in Table 23. Treatments in the Mosquito Flat Fuel Reduction Project. Current stand conditions will be used to determine whether or not the stand conditions goals, identified in Table 23, have been met. Applicable treatment method(s) will then be implemented to meet desired goals. A total of 742 acres exist that could potentially be commercially thinned, such as through a timber harvest, based on stand conditions and site suitability.

No tree cutting, sale or removal of merchantable material would occur in Idaho Roadless Area (IRA) in Alternative 2. Prescribed burning is the only treatment that would occur in the IRA within the project area. Areas outside of IRA will receive a mix of mechanical, manual and/or prescribed burning treatments in order to meet stand specific objectives.
All treatments areas will include identification and retention of large snags and legacy trees\(^2\). Required design features 53-SV and 54-SV within this document provide specific requirements for snags and legacy trees.

Treatment areas represent a variety of stand conditions depending on insect and harvest activities. The proposed treatments identified by the Forest Service for the MFFR Project are listed in Table 1.

### Table 1. MFFR Project Proposed Action.

<table>
<thead>
<tr>
<th>Description</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribed Burn</td>
<td>Implement a <a href="#">prescribed burn</a> across 7,565 acres which includes areas affected by the tree cutting activities described below. Areas that were burned in the 2013 Lodgepole Fire are excluded. Prescribed fire objectives would be to reduce fuel loading in a patchy mosaic pattern across 30-50% of the proposed prescribed burn area. Fires would occur within a range of severities, ranging from low (&lt;25% canopy mortality) to high (&gt;75% mortality). This would create a fine-scale, topographically-driven mosaic of vegetation species assemblages and structural stages, and reduce fuel loads across much of the burn area. Where aspen and whitebark pine occur, this treatment would create conditions more suitable for aspen and whitebark pine regeneration. Burning activities would remove a variety of tree species, from all size classes, depending on burn intensity and tree species resistance to fire effects. Broadcast burning treatments would not occur until after January 1, 2018.</td>
</tr>
<tr>
<td>Thinning Cut</td>
<td>Implement a <a href="#">thinning cut</a> across 1,460 acres that will require cutting and felling of vegetation in order to meet fuels and stand health objectives. Up to 742 of the 1,460 acres include removal of merchantable material through the use of mechanized equipment such as fell-bunchers and skidders, establishment and closure of skid trails and temporary roads. Areas not requiring removal of merchantable sized material to meet fuels and forest health objectives will include thinning of small diameter trees that will be cut with a chain saw, piled by hand and burned (hand treatment). Thinning will occur from below with preferred retention, as per HFRA guidelines, of dominant, disease free, seed producing trees for each stand based on stand specific data. As part of this group of trees all discovered legacy* trees that have survived multiple disturbance will also be retained. The retention of large trees at low to moderate density is compatible with creating and maintaining fire-resilient stands. Selection of conifer trees for retention will be based on existing and potential crown position and associated tree vigor. Crown condition and structure within the project area generally varies depending on the spatial arrangement of existing dominant trees. Where existing forest stands exist in a clumpy spatial...</td>
</tr>
</tbody>
</table>

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\(^2\) Legacy tree – Residual large tree older tree that has survived multiple disturbance events as evident on one side of the tree (Van Pelt, 2008). Bark is hard and deeply fissured. Often crown clearly are fading and flattening, numerous dead branches present, and in case of Douglas-fir bark turns lighter in color with deeper fissures and not so gray in color.
distribution, retained trees in cutting units would generally be arranged as either groups of 2-7 trees with the crowns of each group spaced 5 feet or more apart. Conversely, where existing forest stands exist in a relatively homogeneous spatial distribution, retained trees following cutting activities will generally be arranged as individual trees with crowns spaced 5 feet or more apart.

Exceptions to these patterns include the areas affected by the aspen restoration cutting and broadcast burn activities. Portions of areas affected by these activities are intended to regenerate dense, even-aged aspen stands. Thus, the spatial distribution of large retained trees would vary unit by unit.

Objectives of this treatment include the reduction of hazardous fuels and enhancement of tree vigor, and do not include tree regeneration. This activity is not intended to result in changes of cover type (species composition of the dominant overstory trees), but is intended to result in the conversion of multistory structure classes to single-story structure classes.

No tree cutting, sale or removal would occur in Idaho Roadless Area (IRA).

| Aspen Restoration Cut | Implement an **aspen restoration** cut across 224 acres using chainsaws or pruning shears. This would generally occur in stands where aspen are present but are dominated by conifers, in order to promote aspen vigor and regeneration.

  All live and dead conifer trees are cut up to twice the height of the mature aspen trees. Where aspen and conifers co-dominate the regenerating trees, hand chainsaws or pruning shears would be used to remove the conifers. Legacy trees\(^2\) and snags will also be retained according to forest plan standards.

  Individual conifers of all size classes within areas outside of existing aspen stands could also be harvested to provide improved growing conditions for the remaining conifers or aspen, and reduce crown density. In most areas where groups of trees are harvested and openings are created, this activity is intended to result in a change of cover type (species composition of the dominant overstory trees) from Douglas-fir and lodgepole pine cover types to aspen cover type.

  Fencing would be constructed if necessary to ensure establishment and development of aspen regeneration per NFMA and Forest Plan stocking requirements.

  All affected stands are intended to remain in the Young Multi-strata Forest structure class. No tree cutting, sale or removal would occur in Idaho Roadless Area (IRA). |

| Overstory Removal Cut | Implement an **overstory removal (OSR)** cut on 48 acres. An OSR cut involves the cutting of live and dead trees constituting an upper canopy layer to release existing understory trees. The primary source of regeneration is advance reproduction. A minor (less than approximately 10% of full stocking) live component of the upper canopy may be |
retained for reasons other than regeneration. Where advance reproduction is composed of aspen and conifer trees, hand chainsaws or pruning shears would be used to remove some or all of the conifer component from the reproduction.

This activity is not intended to result in changes of cover type (species composition of the dominant overstory trees) but is intended to result in the conversion of two-aged forest structures to younger structure classes dominated by seedlings and saplings.

No tree cutting, sale or removal would occur in Idaho Roadless Area (IRA).

| Roads | Up to three and one-half miles of closed FS system or temporary roads are expected to be opened, improved or constructed, and reclosed or decommissioned following project completion. All planned temporary roads will be outside the Riparian Habitat Conservation Areas. A gated 1.5 mile FS system road is included in the 3.5 miles of road improvements needed to implement the project. The road was created during previous management activities and will be opened for administrative use to complete the project and continue to be closed to the public. Once harvest activities are completed, all temporary roads constructed during operations would be decommissioned. This would involve re-contouring and seeding these sections with a native grass seed mix. These areas would be monitored for three to five years after decommissioning for invasive plants and for revegetation success. Any invasive plants that were detected would be treated and reseeding would occur if necessary. To provide for public safety some roads could be closed or traffic restricted during prescribed burning and hauling activities. |
| Noxious Weeds | Inclusion of design features that incorporate USDA Forest Service Guide to Noxious Weed Prevention Practices for all project associate activities. All temporary roads and constructed trails/landing areas would be monitored for 3-5 years for invasive plants following project completion, and invasive plants would be treated if present. |
| Implementation Schedule and Duration | The duration of project activities implementation, which includes both cutting and broadcast burn treatments, may occur up to 8-10 years from project initiation of implementation. Burn treatments would be repeated as needed in dry Douglas-fir habitat types approximately every 20-40 years. Project generated activity fuels left on site in the form of machine or hand piles will be removed by burning them on site within 2-4 years of their construction. |
Table 2. Summary of Proposed Action Treatment Acres.

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>ACRES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thinning by Hand/Chainsaws</td>
<td>718</td>
</tr>
<tr>
<td>Thinning by Mechanical Harvest</td>
<td>742</td>
</tr>
<tr>
<td>Overstory Removal</td>
<td>48</td>
</tr>
<tr>
<td>Aspen Restoration</td>
<td>224</td>
</tr>
<tr>
<td><strong>TOTAL Acres for Cutting and Felling of Trees</strong></td>
<td><strong>1,732</strong></td>
</tr>
<tr>
<td>Pile &amp; Broadcast Burn Treatments following Thinning, Overstory Removal &amp; Aspen Restoration Treatments</td>
<td>1,732</td>
</tr>
<tr>
<td>Broadcast Burn Treatment ONLY</td>
<td>5,833</td>
</tr>
<tr>
<td><strong>TOTAL Prescribed Burn Acres</strong></td>
<td><strong>7,565</strong></td>
</tr>
<tr>
<td>Lodgepole Fire Burned Area w/in Project Boundaries (excluded from treatment)</td>
<td>2,065</td>
</tr>
<tr>
<td><strong>TOTAL Project Area</strong></td>
<td><strong>9,630</strong></td>
</tr>
</tbody>
</table>

1.6 Decision Framework

Based on the environmental analyses in this EA, the District Ranger will decide whether or not to reduce fuel loading as proposed within the project area in accordance with NEPA, HFRA, Forest Plan goals and objectives, and desired future conditions. In the decision, the responsible official, District Ranger Michael Spisak, would answer the following questions based on the environmental analysis:

1. Would the proposed action proceed as proposed, modified, or not at all? If it proceeds:

2. What design features and monitoring requirements would the Forest Service apply to the proposed fuels reduction treatments?

3. Does the proposed project require a Forest Plan amendment?

4. Is an Environmental Impact Statement (EIS) necessary?

The need for Forest Plan amendments or an EIS will be identified by stating findings based on this EA. The decision document summarizes findings from the EA and addresses the above questions will be the Decision Memo/Findings of No Significant Impact.
1.7 Agency, Public and Tribal Involvement

Public involvement for this project began when a description of the project was listed in the quarterly Schedule of Proposed Actions on July 01, 2012. On June 27, 2012, letters describing the project were sent out to representatives of the Shoshone-Bannock and Nez Perce Tribe and to approximately 17 interested organizations, individuals, and government agencies that have indicated an interest in this type of project. A scoping legal notice was published in the Challis Messenger on June 21, 2012.

A total of five comment letters were received in response to the initial scoping. These comments were then used to assist in the identification of issues, creation of the Proposed Action and Alternatives to the Proposed Action, creation of Design Features to minimize adverse effects, and to determine the extent of environmental analysis necessary for making an informed decision.

A public meeting was also advertised in the scoping legal notice, and held on July 25, 2012, at the Challis-Yankee Fork Ranger District office, in Challis, Idaho. One member of the general public attended and provided comment. Additionally, the project Interdisciplinary Team (ID) Team leader attended the Custer County Natural Resources Advisory Committee meeting on August 1, 2012, and gave an informal, but detailed presentation to the Committee members present on the project, answered questions, and listened to comments on the project.

The Forest Service (responsible officials, Interdisciplinary Team members, and/or resource specialist) engaged in discussions as part of the NEPA process with the following individuals/groups:

1.7.1 Federal, State, and Local Agencies
- Custer County Commissioners
- Custer County Extension Agent – Sarah Baker
- Custer County Natural Resource Advisory Group
- Idaho Department of Fish and Game (Salmon and Upper Snake Regions)
- Idaho Parks and Recreation-Jeff Cook
- U.S. Fish and Wildlife Service

1.7.2 Tribes
- Shoshone Bannock – Nathan Small, Chairman of the Shoshone Bannock Tribal Business Council
- Nez Perce – Silas C. Whitman, Chairman Nez Perce Executive Committee

1.7.3 Individuals or Groups
- Darrel Hopkins - Land of the Yankee Fork
- Jonathan Oppenhiemer - Idaho Conservation League
- Katie Fite - Western Watershed Project
- Mitchell Corrigan - Individual
- Rick Philips – Individual
- Roberta Green Trust (Melissa Dubios) – Individual
- Ronald Green – Individual
- Ormand J. Smith Trust-Individual
- Bruce Smith – Individual
- Phil McNeal – Individual

1.7.4 Other Organizations
- Idaho Roadless Commission
1.8 Issues and Resource Concerns

Forest Service directives provide for the identification of issues to be analyzed in depth (FSH 1909.15, 12.4). Issues serve to highlight effects or unintended consequences that may occur from the proposed action and alternatives, giving opportunities during the analysis to reduce adverse effects and compare trade-offs for the decision maker and public to understand. Issues are best identified during scoping early in the process to help set the scope of the actions, alternatives, and effects to consider; but, due to the iterative nature of the NEPA process, additional issues may come to light at any time. A number of comments were received relative to the MFFR Project during the scoping and comment process. The following suggestions were taken in to consideration in development of the proposed alternatives and/or project design features by the Interdisciplinary Team:

**Fuels/Timber**
- Implementation of fuels reduction treatments and prescribed fire
- Aspen restoration in relation to removal and/or retention of non-legacy sized conifer
- Fuels treatment prescriptions involving retention of snags and all 18” conifers, retention and treatment of course wood debris
- Summary of project area and adjacent fuels/vegetation incorporating consideration of Special Status plants
- Cumulative impacts of vegetation management
- Exclusion of commercial logging within the riparian habitat conservation areas and adherence to PACFISH/INFISH

**Soils & Water quality**
- Potential impacts from reopening, construction and re-contouring of temporary roads and implementation of proposed actions
- Potential impacts to ecosystem components
- Potential impacts of OHV and public use of temporary roads
- Obliteration of all unnecessary user-created trails and roads

**Noxious Weeds**
- Inclusion of design features that incorporate USDA Forest Service Guide to Noxious Weed Prevention Practices for all project associated activities

**Wildlife**
- Retention of security habitat for elk and other ungulates, nesting and roosting wildlife
- Potential mitigation measures for wildlife
- Retain or girdle some non-legacy sized conifers around every aspen clone, while removing the closest conifers, to provide some vertical structure for wildlife if the aspen do not successfully regenerate

Other suggestions for alternative development and/or project design features were proposed and vetted by the Interdisciplinary Team, but were not considered further because the team felt they did not meet the purpose or need of the proposed action. These include:

- **Homeowner Education Campaign**—subject is unrelated to the Decision being made and outside of the Purpose and Need of this project.

- **Alternative Commercial Uses of Small-Diameter Forest Products**—subject is unrelated to the Decision being made and outside of the Purpose and Need of this project.
2.0 ALTERNATIVES

2.1 Introduction
This chapter briefly describes and compares the alternatives considered for the MFFR project. Under HFRA Title I, Section 104 (2c), environmental analyses must describe the proposed action, a no-action alternative, and an additional alternative, if one is proposed during scoping or the collaborative process that meets the purpose and need of the project. During the scoping process several suggestions for alternative development were proposed and are incorporated in the alternative descriptions.

2.2 Process Used to Formulate Action Alternative
The interdisciplinary team (IDT) developed the proposed action and winter logging alternatives in response to the project purpose and need, the existing Forest Plan resource objectives, goals, and standards, and public/agency concerns as directed by NEPA. The IDT consisted of Forest Service personnel who have expertise in different natural resource fields in order to provide a diverse, interdisciplinary approach to the project.

The proposed action and winter logging alternatives were developed through a series of resource evaluations, field visits, IDT meetings, public input and interactions. If either action alternative is implemented, the project would be designed and administered in accordance with:

• Forest Plan Standards and Guidelines (USDA, 1988)
• Rules and Regulations pertaining to the Idaho Forest Practices Act (1998)
• PACISH Interim Guidelines for Riparian Habitat Conservation Areas (RHCA)
• R1/R4 Soil and Water Conservation Practices Handbook (Forest Service Handbook 2509.22)
• Idaho Water Quality and Wastewater Treatment Requirements (IDAPA 58.01.02) and Clean Water Act
• Forest Service Manuals and Handbooks (FSH) Forest Service 2007-2012 Strategic Plan
• Forest Service 2011 Western Bark Beetle Strategy
• National Fire Plan (NFP)
• Clean Air Act and Montana/Idaho Airshed Group coordination requirements

2.3 Alternative 1 - No Action
The HFRA states that while agencies are not expected to fully develop a no action alternative, “they should evaluate the effects of failing to implement the project”.

Although the MFFR project area is within the Mosquito Flat Wildland Urban Interface (WUI) a “No Action” Alternative has been analyzed for this project. Although an alternative with no actions/activities does not, by definition, have any direct, indirect, or cumulative effects on the quality of the human environment, an assessment would be made of the consequences of failing to implement an action alternative.

This evaluation should allow an assessment of the short and long-term effects of failing to implement the project in the event the court is asked to consider requests for an injunction. With the implementation of a No Action Alternative (Alternative 1) the following actions would need to be assessed: 1) Wildfire effects on forests stands, 2) Restoration of the HRV to promote forest health and resistance to insects and disease. 3) Changes in forest structure in the project area and increased potential for uncharacteristic fire behavior.
A high severity landscape-scale wildland fire (during summer drought and extreme weather conditions) is a plausible event in the near-term as a consequence of not implementing hazardous fuels reduction activities. This is the context for which the consequences of adopting Alternative 1 would be evaluated for this project.

2.4 Alternative 2
Alternative 2 will implement the Proposed Action.

2.4.1 Project Area Description
The activities proposed under Alternative 2 would occur across approximately 8,000 acres within the Head of the Yankee Fork Lynx Analysis Unit, as well as minor portions of the Squaw/Mill Lynx Analysis Unit. Both LAUs are currently considered suitable, unoccupied habitat. No mechanized or hand cutting activities are planned in Inventoried Roadless Areas designated under the Idaho Roadless Rule, but broadcast burning activities would occur in the Challis Creek Idaho Roadless Area (5,276 acres). Approximately, 1,789 acres would be treated in the Challis creek watershed above Mosquito Flat dam by tree cutting silvicultural treatments. No activities proposed under Alternative 2 would occur in any of the 2,065 project acres burned by the Lodgepole Fire.

The locations of all proposed temporary roads are shown in Figure 8 and Table 3. Decommissioning activities would include re-contouring all temp road portions visible from open system roads and seeding with a grass seed mix recommended by resource specialists, with a preference for native grass species whenever feasible and appropriate for a given site. All temporary roads and constructed landings would be monitored for 3-5 years for invasive plants following completion, and invasive plants would be treated if present.

2.4.2 Actions/Activities
Alternative 2 proposed actions would implement vegetative treatments that reduce both surface and canopy fuels, increase aspen occurrence and vigor within the project area, and facilitates development of more fire resistance tree stands while providing merchantable timber. The specific treatments proposed in this alternative are found in Table 1. MFFR Project Proposed Action.

The proposed treatment units and burning treatments action area is shown in Table 1. There are four proposed fuel treatment methods that may occur.

Of the 1,460 acres of thinning proposed, 742 acres have slope angles and stand conditions for which cutting equipment would include either hand chainsaws or mechanical track-mounted feller-bunchers or processors. Felled trees with stems greater than or equal to eight inches in diameter at breast height (DBH) would be whole-tree yarded using track-mounted or rubber-tired skidders to landings, where slash would be mechanically piled and later burned. Felled trees with stems less than eight inches DBH would be felled, with slash treated at the location of tree cutting by bucking stems into eight foot lengths, and broadcast burning after lopping and scattering.

The remaining acres that would be affected by tree cutting silvicultural treatments have slope angles exceeding 40% (Morris, 2013). For these units, all trees to be cut as part of the proposed silvicultural activities would be hand-felled, with activity slash treated at the location of felling by bucking stems into eight foot lengths, lopping, scattering, and broadcast burning. Tree skidding would not occur, and trees would be felled along the slope contour, wherever and whenever feasible and safe.
Up to 3 miles of temporary roads are expected to be improved or constructed, and decommissioned following project completion. Of these areas, approximately 1.5 miles of temporary road currently exist as closed, non-system road prisms from previous management activities. The locations of all proposed temporary roads are indicated in Figure 8. Decommissioning activities would include re-contouring all temp road portions visible from open system roads and seeding with a grass seed mix recommended by resource specialists, with a preference for native grass species whenever feasible and appropriate for a given site. All temp roads and constructed landings would be monitored for 3 to 5 years for invasive plants following completion, and invasive plants would be treated if present.

Table 3. Proposed Treatment Acres and Miles of Temporary Roads

<table>
<thead>
<tr>
<th>Activity</th>
<th>Area or Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribed Broadcast Burn</td>
<td>Up to 7,565 acres</td>
</tr>
<tr>
<td>Thinning Cut - by Hand</td>
<td>718 acres</td>
</tr>
<tr>
<td>Thinning Cut – by Mechanical Harvest</td>
<td>Up to 742 acres</td>
</tr>
<tr>
<td>Aspen Restoration Cut</td>
<td>224 acres</td>
</tr>
<tr>
<td>Overstory Removal Cut</td>
<td>48 acres</td>
</tr>
<tr>
<td><strong>FS System Road</strong> currently closed (gated) to the public to be opened for administrative use. The system road will be storm-proofed following harvesting treatments and closed to future public use.</td>
<td>7,920 feet or 1.5 miles</td>
</tr>
<tr>
<td><strong>Temporary Roads</strong> to be constructed and then obliterated, re-contoured, seeded, and monitored for invasive for 3 to 5 years following harvest activities.</td>
<td>12,695 feet or 2.39 miles</td>
</tr>
</tbody>
</table>

2.5 Alternative 3 - Winter Logging

Although not a requirement the Interdisciplinary Team chose to analyze an alternative to the proposed action due to public input/comments in the scoping process and concerns for potential land and resource impacts.

2.5.1 Project Area Description

A Winter Logging alternative would implement the same treatment activities, on the same acres, in the same locations, within the same habitat analysis areas, watershed and management area as the Proposed Action Alternative (Alternative 2) which includes both cutting and broadcast burn treatments. As in Alternative 2 no mechanized or hand cutting activities are planned in Inventoried Roadless Areas designated under the Idaho Roadless Rule, but broadcast burning activities would occur in the Challis Creek Inventoried Roadless Area (in 5,276 acres total).

2.5.2 Actions/Activities

Alternative 3 proposed actions/activities would implement the same vegetative treatments in Alternative 2, which provide merchantable timber, a reduction of both surface and canopy fuels, increased aspen occurrence and vigor within the project area, and development of more fire resistance tree stands as
Alternative 2. As in alternative 2 future wildland fire suppression efforts will continue in the project area, along with cattle/horse grazing activities. Following both alternative 2 and 3 project implementation stand densities will be reduced and regeneration will persist, gradually increasing project area stand densities.

Although the same acres would be considered in Alternative 2 and 3, some of these areas are not logistically capable of supporting winter ground based logging operations due to project area features such as percent slope, frozen ground requirements, spring breakup, and other site/season specific factors.

Winter logging implementation activities would continue during the frozen ground layer period and cease on March 15th, or when the Great Grey Owls begin their mating season/rituals. As in Alternative 2 winter logging landing piles would be burned in the fall the following year after acceptance of timber sale closure by the Forest Service. Impacted soils from the heat of burning at the landings would then be scarified, fertilized, and seed with the same native seed mixes at the roads, the same as Alternative 2. Alternative 3 proposes the same invasive plants monitoring period (3-5 years) for temporary roads, skid trails and constructed landings as Alternative 2.

2.6 Design Features for Action Alternatives 2 and 3

The following design features will be applied to the proposed actions, as well as all construction activities associated with this project:

**Air Quality**

01–AQ: Design features included for implementation shall be consistent with the *Interagency Prescribed Fire Management Handbook* (USDA FS et al. 2014), and Forest Service Manual 5140 direction, therefore, a burn plan shall be developed to address prescribed fire mitigations for air quality, contingency, safety, and identified resource management concerns, according to policy direction. Burn plans must also follow the proper approval process to ensure all objectives and contingencies have been addressed.

**Cultural Resources**

02-CR: Exclude sites CH-49 and CH-452 from any proposed action listed for the project area.

**Fisheries**

03-FH: PACFISH/INFISH fish guidelines for boundary layouts on all proposed treatment units and construction activities will be strictly adhered to. This includes no commercial harvest within PACFISH or modified PACFISH Riparian Habitat Conservation Areas (RHCA) (IDAPA 20.02.01.30.04a).

04-FH: On all mechanical harvest units, incorporate applicable State of Idaho Best Management Practices (IDAPA 20.02 01, Section 30).

05-FH: Each year that the project is implemented, the project leader will review the fish related project design features and best management practices with an agency fish biologist prior to the commencement of the project work.

06-FH: During harvest operations on mechanical harvest units, all temporary roads will be signed to let the public know the roads are not open for their use.
07-FH: Consistent with direction in PACFISH, none of the temporary roads would be within 300 feet of permanently flowing fish bearing streams, within 150 feet of permanently flowing non-fish-bearing streams, within 150 feet of wetlands, ponds, and lakes that are greater than one acre in size, or within 150 feet of Mosquito Flat Reservoir.

08-FH: Consistent with direction in PACFISH, none of the skid trails or landings would be within 300 feet of permanently flowing fish bearing streams, within 150 feet of permanently flowing non-fish-bearing streams, within 150 feet of wetlands, ponds, and lakes that are greater than one acre in size, or within 150 feet of Mosquito Flat Reservoir. Once harvest activities were completed, these areas would be scarified, covered with native debris, fertilized, and/or seeded with a native grass seed mix. These areas would be monitored for three to five years after decommissioning for invasive plants and for revegetation.

09-FH: Once harvest activities are completed, all temporary roads constructed during operations would be decommissioned. This would involve re-contouring and seeding these sections with a native grass seed mix. These areas would be monitored for three to five years after decommissioning for invasive plants and for revegetation success. Any invasive plants that were detected would be treated and reseeding would occur if necessary.

10-FH: All decommissioned temporary roads, skid trails and landings would be monitored for three to five years after decommissioning for invasive plants and for revegetation success. Any invasive plants that were detected would be treated and reseeding would occur if necessary, according to Idaho Best Management Practices (USDA 2001).

11-FH: Staging areas, helibases, helisspots, and parking areas (other than on forest service roads) will not be allowed within the RHCAs of perennial streams. The RHCAs extend 300 feet from permanently flowing fish bearing streams, within 150 feet of permanently flowing non-fish-bearing streams, within 150 feet of wetlands, ponds, and lakes that are greater than one acre in size, or within 150 feet of Mosquito Flat Reservoir.

12-FH: The storage of fuel, oil, or other toxicants will not be allowed within the RHCAs.

13-FH: Fueling activities will not be allowed in RHCAs unless there are no other reasonable alternatives. If fueling does occur within an RHCA, it must be approved by a Forest Service fish biologist and use an approved spill containment plan. This plan must include a spilled fuel containment/catchment device.

14-FH: All heavy equipment will be free of all noxious weeds and aquatic invasive species prior to entering the project area.

15-FH: All heavy equipment will also be free of significant fuel or oil leaks, as determined by the contracting officer, prior to entering the project area, and monitored for fuel and oil leaks while in the project area. Any significant leaks, as determined by the contracting officer, will be repaired immediately.

16-FH: Fuel or oil leaks will be cleaned up and disposed of properly.

17-FH: The use of water from any fish bearing water body will be consistent with the direction found in the current biological assessment and biological opinions for wildfire suppression on the Salmon-Challis National Forest.
18-FH: Burn piles outside of landings shall be limited to the smallest size possible to limit the extent of soil heating. When the burn pile is larger than 10 feet in diameter, it will be scarified, covered with native debris, fertilized, and/or seeded with a native grass seed mix following burning.

19-FH: As needed, disturbed areas would also be scarified, covered with native debris, fertilized, and/or seeded with a native grass seed mix.

20-FH: All fire lines will be constructed with hand tools and all fire lines will be rehabilitated using the Minimum Impact Suppression Tactics (MIST) guidelines (NWCG 2004). The MIST guidelines for fire line rehabilitation are as follows:

a. After fire spread has stopped and lines are secured, fill in deep and wide firelines and cup trenches and obliterate any berms. The berm material should be spread back into the fireline or recontoured to the fireline.

b. Be careful not to reignite or spread hot material hidden in berms across the fireline.

c. Restore drainages by removing fill or dams, reestablish crossings and return to natural configuration. Use waterbars only when necessary to prevent erosion or use woody material to act as sediment dams. Waterbars should only be used on steep slopes and only when necessary. General guidelines for waterbar spacing are listed in Table 4 below. However, it is important to note that improper construction and inappropriate placement of waterbars can create excessive erosion.

d. Ensure stumps are cut flush with ground.

e. Camouflage cut stumps by flush-cutting, chopping, covering, or using fireline explosives to create more natural appearing stumps.

f. Any trees or large size brush cut during fireline construction should be scattered to appear natural.

g. Discourage the use of newly created firelines and trails by blocking with brush, limbs, poles, and logs in a naturally appearing arrangement.

21-FH: No fireline construction is planned within RHCAs. If it is determined that fireline construction is needed within RHCAs, it will only occur in the following situations:

i. The prescribed fire threatens to burn areas that are not planned for burning and construction of fireline within an RHCA is absolutely necessary to prevent this from occurring.

j. The construction of the fireline within the RHCA is approved by a fish biologist.

k. The fireline within the RHCA is rehabilitated within one week after it is no longer needed. In the event that a fireline is needed for an extended period of time, all fireline within an RHCA will be rehabilitated prior to spring runoff for spring burns and prior to winter for fall burns. Rehabilitation of fireline within RHCAs will include constructing waterbars across the fireline and placing logs and other natural material on the fireline so as to prevent sediment from entering the stream from the fireline.

Table 4. Maximum Waterbar Spacing General Guidelines.

<table>
<thead>
<tr>
<th>Percent Grade</th>
<th>Maximum Spacing (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 9</td>
<td>400</td>
</tr>
<tr>
<td>10-15</td>
<td>200</td>
</tr>
<tr>
<td>15-25</td>
<td>100</td>
</tr>
</tbody>
</table>
Hydrology and Soils

22-HS: Select for each harvesting operation the logging method and type of equipment adapted to the given slope, landscape and soil properties in order to minimize soil erosion. (IDAPA 20.02.01.030.03)

23-HS: Ground based skidding shall not be conducted if it will cause rutting, deep soil disturbance, or accelerated erosion. On slopes exceeding forty-five percent (45%) gradient, ground based skidding shall not be conducted except with an approved variance. (IDAPA 20.02.01.30.03a)

24-HS: Limit the grade of constructed skid trails on geologically unstable, saturated, or highly erodible or easily compacted soils to a maximum of thirty percent (30%). (IDAPA 20.02.01.30.03b)

25-HS: In accordance with appropriate silvicultural prescriptions, skid trails shall be kept to the minimum feasible width and number. Tractors used for skidding shall be limited to the size appropriate for the job. (IDAPA 20.02.01.30.03c)

26-HS: Uphill cable yarding is preferred. Where downhill yarding is used, reasonable care shall be taken to lift the leading end of the log to minimize downhill movement of slash and soils. (IDAPA 20.02.01.30.03d)

27-HS: Locate landings, skid trails on stable areas to prevent the risk of material entering streams. (IDAPA 20.02.01.30.04)

28-HS: To prevent landslides, fill material used in landing construction shall be free of loose stumps and excessive accumulations of slash. Locate fire and skid trails where sidecasting is held to a minimum. On slopes where sidecasting is necessary, landings shall be stabilized by use of seeding, compaction, and riprapping, benching, mulching or other suitable means. (IDAPA 20.02.01.30.04c)

29-HS: For each landing, skid trail or fire lines a drainage system shall be provided and maintained that will control the dispersal of surface water to minimize erosion. (IDAPA 20.02.01.30.05c)

30-HS: Stabilize skid trails and fire lines whenever they are subject to erosion, by water barring, cross draining, outsloping, scarifying, seeding or other suitable means. This work shall be kept current to prevent erosion prior to fall and spring runoff. (IDAPA 20.02.01.30.05a)
31-HS: Reshape landings as needed to facilitate drainage prior to fall and spring runoff. Stabilize all landings by establishing ground cover or by some other means within one (1) year after harvesting is completed. (IDAPA 20.02.01.30.05b)

32-HS: Recommended spacing distances for water bars on tractor skid trails are:

<table>
<thead>
<tr>
<th>Skid Trail Water Bar Spacing (In Feet)</th>
<th>Gradient (%)</th>
<th>Sediments &amp; Quartzite</th>
<th>Volcanics</th>
<th>Granitics</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>200</td>
<td>80</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>10-20</td>
<td>160</td>
<td>70</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>20-30</td>
<td>110</td>
<td>55</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>30-40</td>
<td>80</td>
<td>40</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>40-50</td>
<td>60</td>
<td>35</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>50-60</td>
<td>45</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
</tbody>
</table>

33-HS: Deposit waste material from construction or maintenance of landings and skid and fire trails in geologically stable locations outside of the appropriate PACFISH buffers. (IDAPA 20.02.01.30.06c)

34-HS: During and after forest practice operations, stream beds and streamside vegetation shall be protected to leave them in the most natural condition as possible to maintain water quality and aquatic habitat. (IDAPA 20.02.01.30.07)

35-HS: Avoid conducting operations along bogs, swamps, wet meadows, springs, seeps, wet draws or other sources where the presence of water is indicated, protect soil and vegetation from disturbance which would cause adverse effects on water quality, quantity and wildlife and aquatic habitat. (IDAPA 20.02.01.30.07c)

36-HS: Materials to be used (equipment, erosion control materials, vegetation) will be approved by the Contracting Officer’s Representative (COR) or inspector.

37-HS: In all cases no landings will abut against PACFISH designated buffers or on unstable ground; all landings are to be preapproved by Forest Service sale administrator.

38-HS: No less than 7 tons-per-acre of slash would be retained within the mechanical treatments units in order to maintain soil organic material and long-term site productivity as recommended by Graham and others (USDA Forest Service, 1994).

39-HS: Closed roads that were opened and used for harvest operations will be reclosed/closed using identified closure techniques prior to unit acceptance by Forest Service.

Non-Forest Vegetation: Noxious and Invasive Weeds and Range

40-RA: Identify on Sale Area Maps all known locations of noxious or invasive plants.
41-RA: Defer livestock grazing on range and wildlife habitat improvement project areas for a sufficient period of rest in prescribed fire areas in non-forested vegetation groups which include: sagebrush grass, and savannah vegetation groups.
Recreation, Roadless and Visuals

42-RE: To the extent practicable and feasible, cutting unit boundaries would be “feathered” to provide gradual transitions buffers to mitigate any negative visual impacts that may occur.

43-RE: Identify on Sale Area Map any and all facilities/improvements/trailheads.

44-RE: Roads that lead to/from trailheads will be kept open to the public, clear of debris and safe for travel.

45-RE: Locate skid trails, landings, slash piles, and pivot trees to reduce site damage, and visual impacts.

46-RE: Work and burn area warning signs and haul restrictions will be placed and/or imposed in such a manner as to alert the general public of potential hazards, on-going activities, and increase safety for employees and the general public.

47-RE: Monitor all constructed or utilized temporary road conditions for 3-5 years. Take action to address any specific problems as needed.

48-RE: Monitor Forest trail conditions within the project area following the prescribed burn and mechanical treatments.

49-RE: Restrict camping at the Mosquito Flat Reservoir Campground during thinning operations by contract crews within or adjacent to the campgrounds by coordinating contract operation timeframes with the recreation specialist that manages that area.

50-RE: Commercial log hauling on weekends and holidays will be modified as necessary to lessen conflicts between recreation traffic and commercial traffic.

51-RE: Individuals with permitted activities (outfitters, permittees) will be notified prior to commencement of activity operations to reduce potential conflicts.

52-RE: To the extent practicable and feasible, non-system user created routes will be blocked from continued illegal use through the placement of slash, burn piles, temporary roads, and skid trails.

Silviculture

53-SV: Harvest prescription would favor large tree retention, as per HFRA guidelines, by identifying and favoring retention of the dominant, disease free, seed producing trees for each stand based on stand specific data. As part of this group of trees all discovered legacy trees that have survived multiple disturbance will also be retained. The retention of large trees at low to moderate density is compatible with creating and maintaining fire-resilient stands.

54-SV: Selection of conifer trees for retention will be based on existing and potential crown
condition and associated tree vigor. Crown condition within the project area generally varies depending on the spatial arrangement of existing dominant trees. Where existing forest stands exist in a clumpy spatial distribution, retained trees in cutting units would generally be arranged as either groups of 2-7 trees with the crowns of each group spaced 5 feet or more apart. Conversely, where existing forest stands exist in a relatively homogeneous spatial distribution, retained trees following cutting activities will generally be arranged as individual trees with crowns spaced 5 feet or more apart. Exceptions to these patterns include the areas affected by the aspen restoration cutting and broadcast burn activities. Portions of areas affected by these activities are intended to regenerate dense, even-aged aspen stands. Thus, the spatial distribution of large retained trees would vary unit by unit.

55-SV: Whitebark pine will be protected and preserved in the project area. A small amount of incidental mortality from proposed activities is expected. Implementing prescribed fire post treatment will kill less fire resistant species and create a suitable seed bed to promote whitebark pine regeneration. Large live trees would be retained in all areas affected by cutting activities to the extent needed to maintain old growth characteristics appropriate for the forest types of Mosquito Flat area. The retention of large trees at low to moderate density is compatible with creating and maintaining fire-resilient stands.

Wildlife

56-WL: Maintain a minimum number of snags for wildlife as stated in the Forest Plan (IV-8,(x)):
- Timber dominated lands (1.0/acre), Aspen/Riparian (3.0/acre), and around natural openings (4.0 /acre).

57-WL: If suspected nesting, denning, or calving of Forest listed sensitive species is discovered during layout, marking/cruising, or activity operations identified locations will be given to zone biologists to determine importance and decisions/actions to be taken.

58-WL: The season of operation for all cutting treatments (hand or mechanical) will be July 15 – March 31, with cutting prohibited during the period of April 1 – July 14 in order to protect raptor and migratory bird nesting and fledging sites.

59-WL: Conifer trees or snags within and around aspen clones would be retained if: 1) No existing aspen trees are available to provide “vertical structure” AND 2) a Certified Forest Service silviculturist determines that the aspen clone has a substantial risk of regeneration failure following implementation of activities described under Alternative B, AND 3) a Forest Service wildlife biologist determines that “vertical structure” is considered deficient for wildlife habitat needs in the project analysis area. Additionally, where possible, a mix of age classes and diameters of snags will be retained for wildlife benefit.

2.7 Design Features Specific to Winter Logging (Alternative 3)

The following design features will be applied to the proposed actions described in ‘Alternative 3’, as well as all construction activities associated with that alternative:

1. If needed, purchaser and FS Sale Administrator will predetermine location and construction of temporary roads needed for harvest operations prior to winter onset when ground is firm and dry.
2. Pre-haul maintenance of haul route will occur prior to winter onset and maintenance procedures will ensure ditches are cleaned, culverts are marked and proper drainage is established. During maintenance operations and snow plowing of haul route culverts should remain clear of debris, low spots will have berms pushed out and maintained allowing proper drainage of water from the road surface.

3. Hauling will cease on plowed roads when daytime temperature exceed 32 degrees F for more than five days in a row.

4. Purchaser will cease haul operations prior to spring melt, when the Forest Service closes haul routes for spring thaw, or when road conditions are no longer sufficiently frozen to avoid damaging the road systems.

5. Harvest operations will not occur until at least six inches (6”) of mineral soil is frozen solid which has been demonstrated to support the largest harvesting equipment. Frozen depth (6”) can be determined by pounding a metal rod into the ground until it breaks through the frozen layer/zone.

6. All landings will be either plowed to remove snow or packed with at least 12 inches of snow 48 hours prior to use to induce a frozen ground layer to minimize the potential site damage. This condition will not be required if ground/surface is frozen to a depth of six inches or greater.

7. The initial snow plowing (first one) should occur at least 24 hours prior to initiation of hauling operations and all snow plow operations will leave a four inch (4”) layer of packed snow on all road surfaces.

8. Roads will only be open to purchaser and over snow machines; no other motorized vehicles will be allowed.

9. Posted warning signs will be placed on all shared roads that are part of over snow machine routes. Sufficient number of openings will be created that allow over snow machines to exit and come back onto the road where hauling equipment may be encountered.

2.8 Project Schedule and Duration for Alternatives 2 and 3

The duration of project activities implementation, which includes both cutting and broadcast burn treatments, may occur up to 8-10 years from project initiation of implementation. Prescribed fire treatments would not occur until after January 1, 2018. Burn treatments would be repeated as needed in dry Douglas-fir habitat types approximately every 20-40 years. Project generated activity fuels left on site in the form of machine or hand piles will be removed by burning them on site within 2-4 years of their construction.
3.0 ENVIRONMENTAL CONSEQUENCES

3.1 Introduction
This section describes the current condition for specific resource areas, and provides a summary of the Specialists’ analysis (reports) of the proposed action and alternatives for each impacted resource. The direct, indirect and cumulative effects are the scientific and analytic basis for the comparison of the effects of implementing the proposed action in relation to not doing so. The full versions of these specialist reports are available in the project analysis file at the District office in Challis, Idaho.

3.2 Direct, Indirect, and Cumulative Effects Analysis
There are three types of effects that must be considered during a NEPA analysis; direct, indirect and cumulative. Direct and indirect effects are a way to measure changes that occur to the environment through a cause and effect relationship for each resource. Direct effects are those occurring at the same time and place as the triggering action. Indirect effects are those occurring at a later time or at a distance from the triggering action. They vary for each resource in space and time and relate to site-specific locations. This space and time should expand or extend until the effects of the alternatives are no longer quantitatively or qualitatively relevant or until the value becomes stable.

Cumulative effects are defined in the Council on Environmental Quality NEPA regulations as the “impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions…1 (40 CFR 1508.7). CEQ has interpreted this regulation as referring only to the cumulative impact of the direct and indirect effects of the proposed action and its alternatives when added to the aggregate effects of past, present, and reasonably foreseeable future actions (Connaughton, 2005).

The Interdisciplinary Team identified a list of ongoing and reasonably foreseeable future actions that might have cumulative impacts in conjunction with the proposed action. Each resource specialist considered different mixes of these actions, depending on the cumulative effects boundary for the resource area and the resource affected. Unless otherwise indicated, the spatial and temporal boundaries for the analyses in the resource effects sections are the project area and the life of the project and post-project connected activities—about 10 years, with the exception being broadcast burn treatments that will continue to occur every 20-40 years.

Activities identified by the Interdisciplinary Team in the Cumulative Effects Analysis Area included: botany, insects and disease, timber harvest, forested vegetation management, mining and mineral extraction, grazing, transportation system construction and maintenance, developed and dispersed recreation, OHV use and management, firewood gathering, fire suppression and fire history of the area, prescribed burning and fuels reduction, noxious weed management, watershed/fisheries enhancements, and private land activities (see Appendix B: Project Catalog of Activities and Actions for Cumulative Effects Analysis).

Additionally, during the summer months of 2013, the Lodgepole Fire burned a total of 2,065 acres within the MFFR identified project. The Interdisciplinary Team therefore incorporated an adjustment to the proposed design features that would exclude prescribed fire ignitions from the area burned by the Lodgepole Fire, as well as delay all prescribed fire implementation in the project area until the year 2018. These actions have been included in the proposed action and treatment unit boundaries, and have either
been analyzed in each specialist report or, in cases where specialist reports had already been completed, were captured in the December 9, 2015 addendum, located in the project folder.

3.3 Botany

3.3.1 Affected Plant Species

Federally Listed Species
The Forest Service is required to manage habitat and activities to promote recovery for listed species that occur on National Forest System lands (Forest Service Manual 2670.21 1995). The Forest Service is also required to avoid adverse effects to listed species and their habitats from Forest Service land management actions, unless such effects can be compensated or when a waiver is granted for exemption or incidental take (Forest Service Manual 2670.31 1995).

During the summer of 2013 a pre-field review document was completed (Preliminary Botanical Review) to determine if the MFFR Project is within the range of any Salmon-Challis National Forest Listed Threatened, Endanger, or Sensitive species; and if suitable habitat is present within the proposed project area. The objective of this review was to determine if suitable habitats were present, and thus if further surveys would be required to assess potential effects associated with the project. Surveys are not required for species for which suitable habitat is not present, and for which the project area is outside of the currently know range of species.

Endangered, Proposed, and Candidate (EPC) Species
There are no federally listed endangered, proposed or candidate (TEP) plant species for the Salmon-Challis National Forest (SCNF) (USFWS, Endangered and Threatened Wildlife and Plants, 2014). Because there is none of these species or their habitat present there are no effects for any of the alternatives and their proposed actions.

Threatened and Sensitive (TS) Species
Twenty-one species are listed as threatened or sensitive on the SCNF and were assessed for this BA/BE for possible effects from the MFFR project. The Preliminary Botanical Review determined several of the threatened and sensitive species range or appropriate habitats are not present in the project area and were eliminated from further ground based field surveys.

The Preliminary Botanical Review determined that suitable habitat is present for the following threatened species:

1. Utah lady tress (Spiranthes diluvialis, Status-threatened)

The pre-field review determined documented occurrences or suitable habitat for the following sensitive species:

1. Lemhi milvetch (Astragalus aquilonius, Status, sensitive)
2. White Clouds milkvetch (Astragalus vexilliflexus var. nubilus, Status-sensitive)
3. Mesic (meadow) milkvetch (Astragalus diversifolius, Status, sensitive)
4. Welsh buckwheat (Eriogonum capistratum var. welshii, Status-sensitive)
5. Sacajawea’s bitterroot (Lewisia secajaweana, Status-sensitive)
6. Challis crazyweed (Oxytrophis besseyi var. salmonensis, Status-sensitive)
8. Whitebark pine (Pinus albicaulis, Status-sensitive)
9. Wavy-leaf thelypody (Thelypodium rapandum, Status-Sensitive)

A field survey was conducted specifically for this project regarding these nine sensitive and one threatened species within the project area concentrating on suitable habitat within the project area and the proposed treatment units. **Habitat was determined to be present for the following sensitive species:**

*Lemhi Milkvetch, Mesic (meadow) milkvetch, White Clouds milkvetch, Welch buckwheat, Sacajawea’s bitterroot, Idaho pennycress, Challis crazyweed, Whitebark pine, Utah lady tress, Wavy-leaf thelypodium*

Of these species the following sensitive species were documented as present at the following locations (with noted distance from MFFR project area):

1. White Clouds milkvetch (*Astragalus vexilliflexus* var. *nubilus*, Location-Sawtooth NF. Near East Fork Salmon River/West Pass Creek. Custer County. ~30 miles south of Mosquito Flat area.)
2. Welsh buckwheat (*Eriogonum capistratum* var. *welschii*, Location-Mostly in Big Lost River and Phasimerio Valleys/Mountains. Custer, Butte, Lemhi Counties. Closest population ~14 miles east of Mosquito Flat area.)
3. Idaho pennycress (Aka Stanley thlaspi) (*Thlaspi idahoensis* var. *aileeniae* syn. *Noccaea idahoensis* var. *aileeniae*, Location-Kelly Creek and Capehorn area. Custer County, ~35 miles west of Mosquito Flat area.)
4. Wavy-leaf thelypody (*Thelypodium rapandum*, Location-Phasimerio Mountains, Pennal Gulch near Salmon River, Challis National Forest. Custer County. ~15 miles east of Mosquito Flat area; confluence of Salmon River and Bradshaw Gulch. Custer country. ~14 miles southeast of Mosquito Flat area.)

### 3.1.2 Alternative 1- No Action

**General, Direct, and Indirect Effects for Threatened and Sensitive Species**

As indicated in the discussion on threatened and sensitive species above the Region 4 Regional Forester has listed plants for which there is a concern for species viability as threatened. One threatened and nine sensitive species of concern that have potential suitable habitat or documented occurrences in areas that may be affected by the proposed project were identified in the specialist report for this EA.

A “No Action” Alternative was analyzed for this project. Although an alternative with no activities associated does not, by definition, have any direct, indirect, or cumulative effects on the quality of the environment, an assessment will be made of the consequences of not implementing the action alternative. The assessment of the no action alternative complements the discussion of the existing conditions within the project area; however, the existing condition and expected biological changes provide insight to the long term habitat under this alternative.

Existing management would continue, as would biological processes, and these may influence threatened and sensitive species habitat suitability, and therefore species use of the project area. Vegetative conditions will change over time. Currently, beetles and diseases are at moderate and above levels as a result of stand density and age, and drought. Under the no action alternative, we may expect an increase in insect-related defoliation. The existing very dense stands have reduced vigor, which further makes them more susceptible to disease and insects. Aspen and whitebark pine stands and individual trees will continue to
be encroached by other conifers, and eventually these species may become much reduced or absent on the
landscape.

Changes in forest structure in the project area have significantly increased the potential for
uncharacteristic fire behavior. A landscape-scale wildland fire during summer drought and extreme
weather conditions is a plausible event in the near-term as a consequence of not implementing hazardous
fuels reduction activities in the project area identified for treatment. This is the context for which the
consequence of adopting Alternative 1 was evaluated for this project.

Summary of Effects

Implementing Alternative 1 (no action) would not result in any direct or indirect effects to threatened and
sensitive plants because there are no proposed actions associated with this alternative.

3.1.3 Alternatives 2 and 3 - Proposed Action and Winter Logging

Direct and Indirect Effects

Threatened Species

Although the presence and distribution of *Utah lady tress* in the project area is unknown there are no
proximal (situated near the point of origin) known populations in the project area and no populations were
discovered during the project specific surveys. There may be potential for adverse effects to individuals
that have not been discovered or identified within the MFFR project area.

There should be minimal direct and indirect effects from proposed fuel reduction treatments as they are
targeted for heavier forested canopies which are not suitable habitat for *Utah lady tress* and some project
designs would benefit this species (i.e.: stream buffering). There would not be a cumulative effect from
this project.

Sensitive Species

As indicated in the prior discussion regarding threatened and sensitive species the Region 4 Regional
Forester has listed plants for which there is a concern for species viability as sensitive. Sixteen sensitive
plant species are known, or thought likely to occur on the SCNF (USDA). Only the nine species of
concern that have potentially suitable habitat or documented occurrences in areas that may be affected by
the proposed project were identified, addressed, and discussed in the BE for Sensitive, Threatened, and
Endangered Plant Species and this document specific to the MFFR project.

No proximal known populations, no populations were found during project specific surveys for the
following species: *Lemhi milkvetch, White Clouds milkvetch, Mesic (meadow)milkvetch, Welch
buckwheat, Sacajawea's bitterroot, Idaho pennycress, Challis crazyweed, Wavy-leaf thelypody, and
Whitebark pine.*

Table 6 displays these nine project specific sensitive species, their potential threat and potential impacts
from the MFFR project.

The proposed action is evaluated in terms of how the proposed activity would affect sensitive plant
species viability in the context of a variety of factors, including size of known populations, geographic
range of know plant populations outside of planning area and degree of species sensitivity to short-term
and long-term habitat modification.
### Table 6. Species threats and Potential Impacts of MFFR Project.

<table>
<thead>
<tr>
<th>Species</th>
<th>Threats (sensitive to)</th>
<th>Potential impacts from MFFR Project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lemhi milvetch</strong></td>
<td>Livestock and antelope grazing</td>
<td>There is potential for short-term adverse effects to unidentified individuals in the proposed project area.</td>
</tr>
<tr>
<td><strong>Mesic (meadow) milkvetch</strong></td>
<td>Habitat loss to agriculture and grazing</td>
<td>Ground disturbance and modification of light, moisture, and nutrient regimes within forest and associated plant environments can affect sensitive plants and their habitats.</td>
</tr>
<tr>
<td><strong>White Clouds milkvetch</strong></td>
<td></td>
<td><strong>Potential impacts from MFFR Project</strong>&lt;br&gt;Minimal <em>direct and indirect</em> effects from proposed fuels reduction treatments because treatments are targeted for heavier forested canopies and aspen stands, which are not considered potential habitat for this species. There will not be a <em>cumulative effect</em> for this population in the proposed project area.</td>
</tr>
<tr>
<td>Welsh buckwheat</td>
<td>Cattle grazing, off-highway use, and mining.</td>
<td>There is potential for short-term adverse effects to unidentified individuals in the proposed project area.</td>
</tr>
<tr>
<td>Sacajawea’s bitterroot</td>
<td>Same</td>
<td>Minimal <em>direct and indirect</em> effects from proposed fuels reduction treatments because treatments are targeted for heavier forested canopies and aspen stands, which are not considered potential habitat for this species. There will not be a <em>cumulative effect</em> for this population in the proposed project area.</td>
</tr>
<tr>
<td>Idaho pennycress</td>
<td>Same</td>
<td></td>
</tr>
<tr>
<td>Challis crazyweed</td>
<td>Same</td>
<td></td>
</tr>
<tr>
<td>Wavy-leaf thelypody</td>
<td>Road maintenance activities, weed control and mining activities.</td>
<td>Planned treatments within this proposed actions will not effect this species as it occurs in insolated stands on wind-swept ridges and peaks. This specie will benefit from proposed treatments through removal of dense canopies, and competing trees as it is relatively shade intolerant and grows</td>
</tr>
<tr>
<td><em>Pinus albicaulis (PIAL)</em></td>
<td>Introduced white pine blister rust, increases in mountain pine beetle, fire suppression development, climate change and associated successional replacement.</td>
<td></td>
</tr>
</tbody>
</table>
slowly limiting its competitive abilities (Nature Serve, August 2, 2013)

There is potential for adverse direct and indirect effects to individuals within this project area if prescribed fire activities were to produce high intensity fire activity “escaping” into a stand of this species.

Minimal direct and indirect effects from proposed fuels reduction treatments because treatments are targeted for heavier forested canopies and aspen stands, which are not considered potential habitat for this species.

There will not be a cumulative effect for this population in the proposed project area.

Summary of Effects

The MFFR Project proposed action alternatives may affect, but is not likely to adversely affect, the federally threatened plant species Utah lady tress.

Ground disturbance, modification of light, moisture, and nutrient regimes, may have a short-term adverse impact, but long-term beneficial effect if the proposed activities serve to reduce the risk of habitat loss through wildfires, insect infestation, or excessive mortality. The MFFR Project proposed action and winter logging alternatives may impact individuals but are not likely to cause a trend to federal listing or a loss of viability for the nine sensitive species listed in Table 6 above.
3.4 Fire and Fuels

3.4.1 Affected Environment
The analysis area for determining the direct, indirect and cumulative effects of fire disturbances and fuel loading trends will be the 9,630 acres of the MFFR project area (fuel treatment and broadcast burning), including the 7,344 acres within the Idaho Roadless Rule’s Challis Creek Roadless Area (#004). All of the roadless acres in the project area are under the Backcountry Theme where it states activities away from roads would likely be in the form of prescribed fire.

The project area is primarily characterized by two different fuel groups, conifer and aspen. The conifer group includes two primary habitats, Douglas-fir/pinegrass (PSME/CARU) and subalpine/pinegrass (ALBA/CARU), which are cool dry sites with lodgepole pine prevalent in the subalpine sites. Historically Douglas-fir stands were open grown with low stocking densities and single story larger (18” DBH or larger) diameter trees; while subalpine stands are high elevation, shade-tolerant, can grow under any light conditions and tolerates a higher level of stocking densities and multi-story stands.

The aspen group is intermingled with Douglas-fir and lodgepole pine, with snowberry and thalictrum in the understory and transitioning to whitebark pine in the highest elevations. Historically aspen stands are all native to cold regions with cool summers, typically grow in large clonal colonies, derived from a single seedling, and spread by means of root suckers. Aspens do not thrive in the shade; fire indirectly benefits aspen trees, since it allows the saplings to flourish in open sunlight in the burned landscape. Without disturbance the current aspen stands are disappearing because later successional species replace them by out-competing them for water, light, and nutrients (Debyle & Winkor, 1985). Aspen stands within the roadless area will not have any mechanical treatment but will get priority treatment with the ignition of prescribed fires to stimulate their regeneration and reduce conifer encroachment.

Current levels of ladder fuels and dead material in the project area would result in very hot fires when they do occur and hot fires of this nature eliminate Douglas-fir, which otherwise is more resistant to fire damage than lodgepole pine (Crane & Fischer, 1986). Fires at such time often crown and result in complete stand mortality. Fire behavior modeling of stand and fuels data from these stands indicated a plume dominated crown fire would develop on an average with 6 miles per hour eye level wind.

Currently the area is experiencing heavy infestations of western spruce budworm (WSB) causing trees to defoliate starting at the crown, characterized by dead or brown tops. Isolated pockets of DFB are apparent with large trees being more susceptible when stressed by budworm defoliation and drought. The mountain

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3 Fire Regime Condition Class – FRCC classes are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central tendency of the natural (historic) fire regime, or fire occurrence, and associated condition class that provide data used to infer risk to ecosystem sustainability and risk of uncharacteristic wildland fire behavior and effects.

4 Fire Group – based on the response of the tree species to fire and similar post fire successions.
pine beetle has caused significant mortality to lodgepole pine and the aspen stands are declining because of old age and conifer encroachment.

Project area treatment units represent a variety of stand conditions depending on insect and harvest activities. Fuel inventories conducted in 2011 and 2012 (project specific) indicate fuel accumulations through fire exclusion and other disturbances have occurred in the proposed MFFR analysis area. Across the landscape the dead and down fuel loading averages 14 tons per acre and ranged from 4 tons per acre up to 23 tons per acre. The lack of fire cycles has led to the development of ladder fuels that are smaller and/or younger trees that have grown under and amongst older, larger trees. Stand exam data collected in the project area indicates there is an average of 1,596 trees per acre under 5 inch DBH which comprise the highest percentage of ladder fuels. Ladder fuels change the wildfire potential from low intensity under-burns that likely occurred historically, to a high intensity stand-replacing fire (Mcinnis, 1997).

**Methodology of Analysis**

**Measurement Indicators:**
- Acres of high and moderate risk stands receiving treatment
- Fuel loading (tons/acre)
- Fire rate of spread (chains/acre) and whether crown or surface fire

Actual weather data from the Challis-Yankee Fork Ranger District was used for fire behavior modeling. Historic weather records for the last 20 years were collected from the Bonanza weather station (101801) via Kansas City. This station best represents the project area’s weather conditions being at similar elevation, habitat type, and aspect. Data was entered into FIREFAMILY PLUS (USDA Forest Service, Firefamily Plus, 1999) and the typical fire season was defined on the project area as July 1 through September 30.

Table 8 expresses the three percentile weather outputs from FIREFAMILY PLUS utilizing the climatology data. Table 9 expresses modeled fire behavior for project area under the present conditions for normal, drought, and severe weather conditions.

<table>
<thead>
<tr>
<th>Fire Behavior Models, Field Data, Weather Analysis</th>
<th>Purpose/Use for Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuels Management Analyst Plus (FMA), 2005</td>
<td>Facilitates the assessment of potential fire behavior and effects of fires burning in different fuel profiles.</td>
</tr>
<tr>
<td>Behave Plus Fire Modeling System V5.0.5</td>
<td>Collection of models that describe fire and the fire environment using minimum amount site-specific data to predict fire behavior for a point in time/space.</td>
</tr>
</tbody>
</table>

5 By assessing and analyzing the data collected in the project area, using Aids to Determining Fuel Models for Estimating Fire Behavior (Anderson, 1982) the weighted average by acres of total down and dead fuel loadings is 14 tons-per-acre, typical of a fuel model 10.
Weather Information Management System (WIMS) is a comprehensive system that helps manage weather information and accesses the National Interagency Fire Management Integrated Database that contains historic fire weather and historic fire record information.

FireFamily Plus V4.0 incorporates several DOS programs into a Windows program to work in conjunction with historic weather collected through WIMS system and with the ability to integrate local fire occurrence data.

Field Stand Exams and Fuel Data, collected field season 2011 and 2012 are used to model fire behavior under historic weather conditions taken from archived (20 years) Bonanza, Idaho weather station (101801) via Kansas City for typical fire season (July 1-September 30), for the 50th, 90th, and 97th percentile weather day observations.

### Table 8. Seasonal Fire Behavior Condition Weather Representing the MFFR Project.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Normal Condition</th>
<th>Drought Condition</th>
<th>Severe Drought Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature, Degrees F</td>
<td>80</td>
<td>88</td>
<td>91</td>
</tr>
<tr>
<td>Relative Humidity (%)</td>
<td>15</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>1 hour fuel moisture</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>10 hour fuel moisture</td>
<td>5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>100 hour fuel moisture</td>
<td>12</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Eye level wind (mph)</td>
<td>5</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Herbaceous Fuel Moisture (%)</td>
<td>82</td>
<td>50</td>
<td>37</td>
</tr>
<tr>
<td>Live Woody Fuel Moisture (%)</td>
<td>103</td>
<td>77</td>
<td>64</td>
</tr>
</tbody>
</table>

### Table 9. Outputs from Fire Management Analyst for Normal, Drought, and Severe Drought Weather for MFFR Project under Present Conditions.

<table>
<thead>
<tr>
<th>Direct Model Outputs For a Fuel Model 8</th>
<th>Normal Conditions 50th percentile</th>
<th>Drought Conditions 90th percentile</th>
<th>Severe Drought Conditions 97th percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of Spread (Chains per hour)</td>
<td>11.6</td>
<td>31.2</td>
<td>39.6</td>
</tr>
<tr>
<td>Probability of Ignition (%)</td>
<td>72</td>
<td>98</td>
<td>99</td>
</tr>
<tr>
<td>Flame Length (Ft)</td>
<td>6.1</td>
<td>10.3</td>
<td>11.6</td>
</tr>
<tr>
<td>Fire Type (from FMA)</td>
<td>Active Crown Fire</td>
<td>Active Crown Fire</td>
<td>Active Crown Fire</td>
</tr>
</tbody>
</table>

**Note:** Modeling Assumptions:
1) A .3 wind reduction factor was used to convert 20 ft. winds to eye level winds to model partially sheltered fuels.
2) Weather analysis was performed for dates July 1 – September 30, which represents the typical fire season in the project area.
3) Input required variables for Behave Plus was determined by requesting frequency distribution reports from FIREFAMILY PLUS analyzing the historic weather data obtained from Kansas City.
4) The fire model describes fire behavior in the flaming front.
5) Primary carrier of the fire is the dead fuel less than one-quarter inch in diameter.
6) The fire model is primarily intended to describe fires advancing steadily, from a point, independent of the source of ignition.
7) The fire model describes fire spreading through surface fuels.
8) Fuels, moisture, wind and slope are assumed to be constant during the time the predictions are to be applies.

3.4.2 Alternative 1 – No Action
Implementing the no action alternative would not result in any indirect or direct effects because there are no proposed actions associated with this alternative. Although there would be indirect and direct effects from not taking actions due to the following:

- No high risk (FRCC 3) or moderate risk (FRCC 2) acres would be treated and fuel loadings would continue to increase. (Figure 11)
- Natural processes would continue and accumulation of forest debris would increase natural fuel loadings.
- The watershed would remain vulnerable to a large fire conflagration, similar in nature to the 22,754 acre Lodgepole Fire in 2013.
- Fire behavior modeling of site specific data collected in the watershed indicates a wildfire under a normal summer day will transition into an active plume dominated crown fire.
- The forested areas in and around the Mosquito Flat area would remain characterized as relatively homogenous overstocked forest vegetation dominated by high conifer tree density, and fuel levels. These characteristics would continue to pose risk to life, adjacent private property, and ecosystem components.
- Eventually a chance ignition would lead to a stand replacing fire (50% of fires occurring within the project area would be expected to produce a lethal severity burn… fire behavior modeling indicated a wildfire burning under a normal summer day could transition into an active plume dominated crown fire in the habitat types of the proposed treatment areas).
- The watershed would remain vulnerable to a large fire conflagration (Although this would depict 100 percent lethal burn severity across the drainage, differing winds and weather conditions throughout any given 24-hour period would lessen the percent of lethal burn severity to an average of 43 to 61 percent.).
- Agents of change (MPB, WSB, defoliators and wildland fire) would continue to occur.
- The Mosquito Flat area WUI Zone, identified in the Custer County Wildland/Urban Interface Fire Mitigation Plan, would not receive the recommended fuels treatments or fire hazard mitigation. (Figure 10)

The Table 10 displays the results of running the weather data through Fire Behavior Plus and Fuels Management Analyst Plus to model fire behavior and associated differing levels of fire risk to life and property across the landscape for the No Action and the Action Alternatives (2 and 3).

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Fuel Loading (tons per acre)</th>
<th>Rate of Spread (surface fire in chains/hr.)</th>
<th>Spotting Distance (mi)</th>
<th>Fire Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Action with Wildfire</td>
<td>14</td>
<td>39</td>
<td>0.6</td>
<td>Crown Fire</td>
</tr>
<tr>
<td>Post Proposed Action</td>
<td>5-10</td>
<td>3.1</td>
<td>0.2</td>
<td>Surface Fire</td>
</tr>
</tbody>
</table>
Cumulative Risks and Associated Cumulative Effects
The cumulative risks of the No Action Alternative, or failing to do fuels treatments in the watershed, is high once a wildfire becomes established during the summer months (July 1 to September 30) due to the presence of excessive fuels and high level of tree densities across the landscape. The risk would be high for the occurrence of a stand replacement/crown fire.

Cumulative effects of past, present and future activities that could affect fire and fuels critical components include tree mortality associated with insects and disease; cattle grazing; mining activities; timber harvest; firewood cutting and noxious weed treatments. Cumulative effects associated with occurrence of stand replacement/crown fire would be much the same as the direct and indirect effects stated above. Acres of high fuel loadings, high rates of spread/spotting distance, and potential for high fire intensity would result in fire risk to life, property and ecosystem components.

Assessment and analysis of project specific field data, consultation with the local Fire Management Officer (FMO), utilization of Van Wagner’s crown fire initiation formula and completion of fuels management analyst and fire behavior modeling indicated an active crown fire is expected in all seasonal/weather fire behavior conditions for the MFFR project area. The desired future condition as outlined in the Challis National Forest LRMP would not be met if a wildfire became established in the project area. Tables and analysis outputs supporting this information is available in the project file.

Summary of Effects
The cumulative risks of the No Action Alternative, or failing to do fuels treatments in the watershed, is high once a wildfire becomes established during the summer months due to excessive fuels and tree densities across the landscape. The associated effects of the no action alternative (i.e. no hazardous fuels reduction or restoration activities), would maintain current conditions and trends in the project area, including a continued buildup of natural fuels, potential for stand replacement crown fire, and risk to life, adjacent private property, and ecosystem components.

3.4.3 Alternatives 2 and 3 - Proposed Actions and Winter Logging
The two action alternatives (2 and 3) will implement thinning, aspen restoration, overstory removal and prescribed burning treatments throughout the project area, with no planned mechanical treatments in those acres within the Challis Creek Roadless Area. Mechanical and/or hand thinning treatments would occur on 1,732 acres to advance regeneration, with broadcast burning on 7,565 acres in the project area in a mosaic pattern. The prescribed burning areas would include aspen stands and the areas where mechanical treatment is instituted first as well as in the roadless area where fire would be the only treatment implemented to reduce fuel loadings. Prescribed fire would occur within a range of severities, from low (<25% canopy mortality) to high (>75% mortality). Conifers may be cut before (add fuel to help carry fire) or after the burn (decrease easy access by animals).

Proposed fuel and prescribed fire treatments would create a fine-scale; topography-driven mosaic of vegetation species assemblages and structural stages, and reduce fuel loadings across much of the burn area. Prescribed fire/broadcast burning activities would remove a variety of tree species, especially smaller diameter trees, depending on fire intensity and species resistance to fire effects.
Direct and Indirect Effects

- Ladder and surface fuel reduction as a result of fuels and prescribed fire treatments would break up and reduce current levels of dense forest vegetation, lower stress levels of individual plants, reduce competition for site elements such as space, moisture and nutrients resulting in a reduction in the potential risk for stand replacement crown fire occurrence.
- Reduction in overcrowding would lower the vulnerably to insects and disease such as the current infestations of MPB and WSB.
- Hazardous fuels reduction as a result of fuels and prescribed fire treatments would stabilize or decrease increasing fuels accumulations to a more historic level of fuel loadings in the project area and result in a reduction in potential for high fire intensity and stand replacement crown fires.
- BEHAVE Plus fire behavior modeling indicated a fire would not transition to a crown fire following proposed treatments in the project area, but if entering the project area in the crowns it could remain in the crown with sustained winds greater than 16 miles-per-hour.
- Fuels reduction treatments combined with mixed severity underburns and/or implementation of mixed severity underburns would enhance the potential for forested stand habitat types to return to their historical fuel loadings, resulting wildfire intensity and severity levels specific to the two habitat types in the project area. (About half the forested stands in the project area functioned with non-lethal fire processes as determined from habitat data collected from the area in 2011 and 2012. The other half functioned with stand replacing fires every 100 – 300 years with mixed severity underburns occurring every 25 to 70 years (Steele, 1983). These mixed severity underburns have not happened since the 1870s.)
- Fire suppression capability would be increased by decrease resistance to control. Future wildland fires would exhibit higher rates of spread but decreased intensity and severity resulting in increased firefighter and public safety through reduction in potential for high fire intensity and stand replacement crown fires.
- Reduction in surface and ladder fuels increases the gap between these fuels and canopy/aerial fuels which results in a decreased ability of a low or moderate intensity surface fire to spread into the canopy.
- High intensity or longer duration surface fires with winds would have the potential to spread to the canopy/aerial fuels through increase of surface and transportation of ignition sources (spotting) (strictly based on fire behavior modeling and historical fire occurrence/observations).
- Cost of fire suppression in the project area (and potentially the surrounding area) would be reduced due to reduction in resistance to control. These alternatives (2, 3) mitigate factors that tend to decrease fire suppression capability and increase fire behavior potential, such as reduction in surface, overstory, and hazardous fuel accumulations.
- Reduce the potential for major smoke impacts due to large scale Wildland fires.

Cumulative Effects

Cumulative effects of past, present and future activities that could affect fire and fuels critical components include tree mortality associated with insects and disease; cattle grazing; mining activities; timber harvest; firewood cutting and noxious weed treatments.

Fuel Loadings - In the past, present, and foreseeable future wildfires have and will continue to be suppressed within the project area. This has the effect (intended or unintended) of allowing natural fuels accumulation to increase in the project area over time, outside of areas that experienced fire suppression activities. Increased natural fuels accumulation decreases the ability of direct/non-mechanical fire suppression strategies and tactics; specifically under relative infrequent, severe fire weather and fuel moisture conditions and after hazardous fuels have accumulated over time. Under these conditions, the proposed action alternatives (2 and 3) would reduce the present fuel loading, but would require
maintenance into the future to maintain those fuel loadings. This factor would be mitigated with reoccurring fuels treatments in the project area.

*Insects & Disease* - Cumulative effects associated with insects and disease would be the added surface and aerial fuel loadings. Both action alternatives would counter some of the insect and disease problems that are developing in the project area while providing a reduction in risk of wildfire effects related to insect and diseases.

*Mining* - Mining activity has been a relatively minor use of the Mosquito Flat area in recent times. There has been little active mining in the watershed so no cumulative effects are anticipated.

*Wildfires* – The analysis addresses the increased risk of wildfire in the project area. This proposal was designed to address the wildfire problem associated with the drainage and is expected to reduce the risk of wildfire effects related to the effectiveness of treatments in controlling a wildfire event. The treatments were designed to be effective under normal weather conditions occurring during the summer months.

*Firewood Cutting* – Firewood cutting has been the primary means of removing accessible dead materials in the drainage and is expected to continue to occur as trees continue to die. In aspen and other non-commercial stands outside the roadless area, firewood removal will increase as a way to remove the conifer boles cut in the aspen stands. Additional individuals cutting firewood in the drainage has the potential to create more opportunity for human caused wildfire ignitions. However, human caused wildfires associated with firewood cutting have not been a typical problem on the District and during higher fire danger periods there is a mechanism in place, called fire restrictions, to prevent human caused ignitions on the Forest.

*Noxious Weed* – A design criteria is included to utilize USDA Forest Service Guide to Noxious Weed Prevention Practices for all fuels reductions and project associated activities.

**Summary of Effects**

The proposed action will help return vegetation to a more natural condition and reintroduces fire into the environment. This will help restore natural processes and conditions within the analysis area. Prescribed burning will be by management designed prescriptions to implement when the proper weather conditions are present to achieve the desired results. Thinning treatments, both by hand and mechanical, will be by specified contracts or fuelwood permits to again achieve desired results. Design features have also been added to reduce the chance of negative cumulative effects.

### 3.5 Fisheries

#### 3.5.1 Affected Environment

**Action Area**
The action area as defined under the Endangered Species Act (ESA) is “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action” (50 CFR§402.02). This is the area where the action and any interdependent and interrelated actions will result in direct or indirect affects to the physical environment. Analysis indicates that the project has the potential to effect fish or fish habitat in the following areas: the area within project boundary, an area extending 200 feet from the project boundary, streams downstream of the project area to Mosquito Flat Reservoir, and Mosquito Flat Reservoir. Therefore, these areas have been designated as the action area. It is expected that Mosquito Flat Reservoir will prevent any impacts associated with the project from extending into streams below the reservoir.
Listed Species
There are four ESA listed fish species that occur on and adjacent to the Salmon-Challis National Forest [Endangered and Threatened Marine Species under NMFS' Jurisdiction (http://www.nmfs.noaa.gov/pr/species/esa/listed.htm#fish), query completed on March 15, 2016; U.S. Fish and Wildlife Service Information, Planning, and Conservation System website (http://ecos.fws.gov/ipac/), query completed on March 15, 2016; Intermountain Region (R4) Threatened, Endangered, Proposed, and Sensitive Species, updated February 2013). These are:

1. Snake River Sockeye Salmon (Endangered; Federal Register 56FR58619): Sockeye Salmon, which use the Salmon River to move between the Pacific Ocean and lakes in Stanley Basin, are not present in the action area. Critical habitat has been designated for Snake River Sockeye Salmon (Federal Register 58FR68543). The action area does not contain any Sockeye Salmon designated critical habitat.

2. Snake River Spring/Summer Chinook Salmon (Threatened; Federal Register 57FR14653): Chinook Salmon do not occur in the action area. Critical habitat has been designated for Snake River spring/summer Chinook Salmon and includes “river reaches presently or historically accessible…to Snake River spring/summer Chinook Salmon” (Federal Register 58FR68543). The Salmon-Challis National Forest has delineated Chinook Salmon critical habitat within streams on national forest lands following the process identified in Appendix A. Based on this delineation, the action area does not contain any Chinook Salmon designated critical habitat.

3. Snake River Steelhead (Threatened; Federal Register 62FR43937): Steelhead do not occur in the action area. Critical habitat has been designated for Snake River Basin steelhead (Federal Register 70FR52630). The action area does not contain any Snake River Basin steelhead designated critical habitat.


Sensitive Species
The current sensitive species list for the Intermountain Region of the Forest Service, which was issued in February 2013, indicates that there are two sensitive fish species occurring on the Salmon-Challis National Forest. These are the Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*) and the Big Lost River Mountain Whitefish (*Prosopium williamsoni*). The occurrence of each of these species within the analysis area is described below.

1. Westslope Cutthroat Trout: Westslope Cutthroat Trout are present in the analysis area. Sampling indicates that Westslope Cutthroat Trout are believed to occupy approximately 5.7 miles of Challis Creek and approximately 2.2 miles of unnamed tributaries within the analysis area (Bartel et al. 2009). Westslope Cutthroat Trout are also found in Mosquito Flat Reservoir. This reservoir covers approximately 50 acres when full.

2. Big Lost River Mountain Whitefish: The distribution of the Big Lost River Mountain Whitefish is limited to the Big Lost River basin. The analysis area for this project is completely outside the Big Lost River Basin. Therefore, the analysis area does not contain any Big Lost River Mountain Whitefish.
**MIS species**

Bull trout are the only fish species listed as a MIS on the Salmon-Challis National Forest. Bull trout do occur in the analysis area for this project.

**Other Species**

Brook trout and hatchery rainbow trout occur in the analysis area for this project. Rainbow trout are annually stocked in Mosquito Flat Reservoir by the Idaho Fish and Game Department.

### 3.5.2 Alternative 1 – No Action

**General, Direct, and Indirect Effects for Threatened and Sensitive Species**

A “No Action” Alternative was analyzed for this project. Although an alternative with no activities associated does not, by definition, have any direct, indirect, or cumulative effects on the quality of the environment, *an assessment will be made of the consequences of not implementing the action alternative.* The assessment of the no action alternative complements the discussion of the existing conditions within the project area; however, the existing condition and expected biological changes provide insight to the long term habitat under this alternative.

Existing management would continue, as would biological processes, and these may influence threatened, sensitive and other fish species habitat suitability, and therefore specie use of the project area. Vegetative conditions will change over time. Currently, beetles and diseases are at moderate and above levels as a result of stand density and age, and drought. Under the no action alternative, we may expect an increase in insect-related defoliation. The existing very dense stands have reduced vigor, which further makes them more susceptible to disease and insects. Aspen and whitebark pine stands and individual trees will continue to be encroached by other conifers, and eventually these species may become much reduced or absent on the landscape.

Changes in forest structure in the project area have significantly increased the potential for uncharacteristic fire behavior. A landscape-scale wildland fire during summer drought and extreme weather conditions is a plausible event in the near-term as a consequence of not implementing hazardous fuels reduction activities in the project area identified for treatment. This is the context for which the consequence of adopting Alternative 1 was evaluated for this project.

**Summary of Effects**

Implementing Alternative 1 (no action) would not result in any direct or indirect effects to threatened and sensitive species because there are no proposed actions associated with this alternative.

### 3.5.3 Alternatives 2 and 3 - Proposed Action and Winter Logging

**Direct and Indirect Effects**

The proposed action reintroduces fire into the environment and will help restore natural processes and conditions within the action area. Direct and indirect effects to each of the following environmental factors related to fish habitat are listed below:
Stream Temperature
In the short-term, the proposed action will likely burn a small amount of riparian vegetation within the project area which could have an impact on stream temperatures. However, these impacts would be within the natural range of variability and are expected to be minor. It is unlikely that the effects of these changes on fish could be meaningfully evaluated. Therefore, these short-term effects are expected to be insignificant. Over the long-term, the reintroduction of fire into the action area should help restore or maintain natural processes that affect stream temperature.

Sediment
Prescribed burning vegetation could also result in some sediment moving into streams. However, the burn patterns will mimic natural wildfires by burning at mixed levels of intensity and creating a mosaic burn pattern with most areas burning at low to moderate intensity. Subsequently, changes to stream sediment are expected to be within the natural range of variability and are expected to be minor. It is unlikely that the effects of these changes on fish could be meaningfully evaluated. Therefore, these short-term effects are expected to be insignificant. Over the long-term, the reintroduction of fire into the action area should help restore or maintain natural processes that affect sediment. The development and reopening of temporary roads could also have impacts to this indicator but the effects are minimal and short-term. Once the proposed action is implemented, this indicator would change from functioning at risk to functioning appropriately.

Large Woody Debris and Pool Frequency/Quality
The proposed action will likely burn a small amount of riparian vegetation including large conifer trees. Some of these burned trees will likely fall into streams which would increase large wood abundance. These impacts would be within the natural range of variability and would benefit large wood abundance. Therefore, these impacts are expected to be beneficial. An increase in large wood resulting from the proposed action would also have a beneficial impact on pool frequency and quality. Over the long-term, the reintroduction of fire into the action area should help restore or maintain natural processes that affect large wood abundance and pool frequency and quality. This should help ensure that large wood levels and pool frequency and quality continue to function appropriately which will be beneficial to fish species and fish habitat within the action area.

Change in Peak/Base Flow
Mosquito Flat Reservoir has substantially altered flow regimes in Challis Creek below the reservoir (C. Stewart, personal observation). Likewise, flow regimes have been altered by diversions on national forest lands on Challis Creek (unpublished data). Stream flows can also be manipulated by a dam at one of the Challis Creek Lakes. Collectively these flow manipulations have had an impact on Challis Creek and its ability to support fish. Overall, change in peak/base flows in the action area are likely considered to be functioning at risk.

Disturbance History
The thinning component and the construction of temporary roads of the project could potentially affect disturbance history, but the effects are considered to be minimal and short-term. The thinning treatments have been designed to avoid impacts to fish and fish habitat. No mechanical treatments will occur within 300 feet of fish bearing perennial streams. The proposed action will help reduce the unnatural buildup of fuels within the action area and will reduce the risk of the action area experiencing unnaturally large, high intensity, stand replacing wildfires. This will help ensure that such fires do not have adverse impacts to fish and fish habitat which will be beneficial to fish and fish habitat within the action area.
**Disturbance Regime**

The thinning component of the project could affect disturbance regime, but impacts will be are believed to be minimal. The thinning treatments have been designed to avoid impacts to fish and fish habitat. The proposed action reintroduces fire into the environment and help provide an environment that can recover from future disturbances which will be beneficial to fish and fish habitat within the action area.

**Riparian Conservation Areas**

It is unlikely that the thinning component of the project will affect riparian conservation areas. The thinning treatments have been designed to avoid impacts to fish and fish habitat. No mechanical treatments will occur within 300 feet of fish bearing perennial streams. In the short-term, the proposed action will burn vegetation including a small amount of riparian vegetation. However, the burn patterns will mimic natural wildfires by burning at mixed levels of intensity and creating a mosaic burn pattern with most areas burning at low to moderate intensity. Subsequently, changes to riparian vegetation are expected to be within the natural range of variability and are expected to be minor. It is unlikely that the effects of these changes on fish could be meaningfully evaluated. Therefore, these short-term effects are expected to be insignificant. Over the long-term, the reintroduction of fire into the action area should help restore or maintain natural processes that affect riparian vegetation. This should help ensure that riparian vegetation continues to function appropriately which will be beneficial to fish and fish habitat within the action area.

**Summary**

Overall, stream temperatures, sediment, large woody debris, peak/base flows, the disturbance regime and the disturbance history in the action area are likely considered to be functioning at risk. Once the proposed action is implemented, this indicator would change from functioning at risk to functioning appropriately, with the exception of peak/base flows. Over the long-term, the reintroduction of fire into the action area should help restore or maintain natural processes that affect stream flows. While this will improve flow regimes, peak/base flows would continue to function at risk within the action area.

Pool frequency and quality, and riparian conservation areas are in considered to be functioning properly, and over the long-term, the reintroduction of fire into the action area should help restore or maintain natural processes that affect riparian vegetation. This should help ensure that riparian vegetation continues to function appropriately which will be beneficial to fish and fish habitat within the action area.

**Cumulative Effects**

Anthropogenic influences that are affecting fish and fish habitat within the analysis area include Mosquito Flat Reservoir; road maintenance and use; a diversion; timber harvest; livestock grazing; a lack of wildfire associated with fire suppression; fishing; recreation; fish stocking; and non-native brook trout. Of all these influences, non-native brook trout are likely having the most substantial impact on Westslope Cutthroat Trout and Bull Trout. Sampling indicates that brook trout are present in Challis Creek upstream of Mosquito Flat Reservoir (Bartel et al. 2009, Stewart et al. 2015) and are likely limiting Westslope Cutthroat Trout abundance in that section of stream. Mosquito Flat Reservoir has eliminated the stream habitat that occurred in the area now occupied by the reservoir. The absence of wildfire associated with fire suppression has also altered natural conditions and processes within the analysis area and has likely impacted fish and fish habitat. In 2013, the Lodgepole Fire burned a portion of the analysis area and this event began restoring these natural processes. The other anthropogenic influences listed above are likely having only minor effects on Westslope Cutthroat Trout and Bull trout. The proposed action will help return vegetation to a more natural condition and reintroduces fire into the environment. This will help restore natural processes and conditions within the analysis area and should help improve Westslope
Cutthroat Trout and Brook trout habitat. Subsequently, the proposed action is expected to have beneficial cumulative effects on Westslope Cutthroat Trout and Bull trout.

**Summary of Effects**

**Sockeye Salmon and Sockeye Salmon Designated Critical Habitat**
The lack of Sockeye Salmon and Sockeye Salmon designated critical habitat within the action area precludes the proposed action from having direct, indirect, or cumulative effects on Sockeye Salmon and Sockeye Salmon designated critical habitat. Therefore, the proposed action results in a “NO EFFECT” determination for Sockeye Salmon and a “NO EFFECT” determination for Sockeye Salmon designated critical habitat.

**Snake River Spring/Summer Chinook Salmon and Snake River Spring/Summer Chinook Salmon Designated Critical Habitat**
The lack of Chinook Salmon and Chinook Salmon designated critical habitat within the action area precludes the proposed action from having direct, indirect, or cumulative effects on Chinook Salmon and Chinook Salmon designated critical habitat. Therefore, the proposed action results in a “NO EFFECT” determination for Chinook Salmon and a “NO EFFECT” determination for Chinook Salmon designated critical habitat.

**Snake River Steelhead and Snake River Steelhead Designated Critical Habitat**
The lack of steelhead and steelhead designated critical habitat within the action area precludes the proposed action from having direct, indirect, or cumulative effects on steelhead and steelhead designated critical habitat. Therefore, the proposed action results in a “NO EFFECT” determination for steelhead and a “NO EFFECT” determination for steelhead designated critical habitat.

**Bull Trout and Bull Trout Designated Critical Habitat**
The effects analysis concluded that the proposed action may have some impacts on occupied Bull Trout habitat but that these effects are expected to be beneficial or insignificant. Therefore, the proposed action results in a “MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT” determination for Bull Trout. The lack of Bull Trout designated critical habitat within the action area precludes the proposed action from having direct, indirect or cumulative effects on Bull Trout critical habitat. Therefore, the proposed action results in a “NO EFFECT” determination for Bull Trout designated critical habitat.

**Essential Fish Habitat**
The Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to evaluate the impact of actions authorized, funded, or undertaken by the agency that may adversely affect the essential fish habitat of commercially harvested species. Within the scope of this action this includes Chinook Salmon. Since the proposed action results in “NO EFFECT” determination for Chinook Salmon and Chinook Salmon designated critical habitat, the proposed action results in a "NO EFFECT” determination for Chinook Salmon Essential Fish Habitat.

**Westslope Cutthroat Trout**
The effects analysis concluded that the proposed action has the potential to effect Westslope Cutthroat Trout and Westslope Cutthroat Trout habitat. While project implementation may have minor, short-term negative on Westslope Cutthroat Trout habitat, the project is expected to create a long-term improvement in habitat, population abundance, and viability for this species. Subsequently, the proposed action results in a determination of “BENEFICIAL EFFECTS” for Westslope Cutthroat Trout.
Big Lost River Mountain Whitefish
The lack of mountain whitefish within the analysis area precludes the proposed action from having any direct, indirect, or cumulative effects to this species. Therefore, the proposed action results in a determination of “NO IMPACT” for Big Lost River mountain whitefish.

3.6 Hydrology and Soils

3.6.1 Affected Environment

Climate
Mosquito Flat area climate is warm and dry summers, cold and moist in winter. Annual precipitation ranges from 20 inches at Mosquito Flat to 39 inches on the headwaters crest of the Challis Creek watershed. Minimum temperatures remain below freezing October through April. These figures are generated by the PRISM Climate Group and substantiated by examination of the Challis weather station. The specialist report contains additional information and is in the project file at the Challis-Yankee Fork RD.

Geology
Geologically, the project area may be divided between north and south of Challis Creek, which forms the southern boundary of the tertiary age Twin Peaks Caldera. The northern portion is entirely within members of the Challis Creek Tuff of the caldera complex (Fisher, McIntyre, & Johnson, 1992). The tuff was relatively hard, dense and, given the dry climate, probably fairly resistant to weathering.

The portion south of Challis Creek is mapped as either tertiary age dacite or rhyolite lava flows, though observation within the project area appeared to be mostly a rhyolite that formed a cobby, angular drift on the slope surfaces. Slopes southeast of the Mosquito Flat reservoir also contain a substantial amount of low density, vesicular pumice. The valley bottom of main stem Challis Creek is mapped as recent, Holocene, landslide material. Road cuts in the slope along the 091 road in the bottom of the valley showed a deep mantle of poorly-sorted, frequently angular colluvium indicative of landslides which forms a kind of northeast trending appendage of the project area is dissected terrain of low knolls, basin meadows, swales and fans. There is little perennial surface water save what may collect in the larger basin-like troughs between rises and creates wet meadows, most prominently in the elk calving restricted use area. Other sources of surface and running water appear to be meadow fans on upper slopes that have some amount of storage of ground water for dry season flow.

There are exposures of rhyolite bedrock on the top of knolls and the upper ridge line of this area, and the dissected terrain may be antecedent to lava flow of the rhyolite. Some of the exposures show very thin bedding or foliation of what was more likely a very viscous flow. However the general hummocky appearance is also indicative of large earthflow type mass movement, the lava rock below perhaps providing a basal shear zone.

For the project area there is generally no evidence of recent landslides at any size and the whole terrain is regarded as remnant landslide topography. The exception to this generality occurred in the spring of 2014 when several widespread, non-typical heavy rain events occurred on the Forest and surrounding area. A couple of these non-typical rain events occurred within the Lodgepole Wildland fire (2013) area resulting in overland debris flow/erosion incidences. A total of 2,065 acres within the project area were burned by the Lodgepole Fire and experienced this same heavy rainfall event resulting in overland debris flow/erosion in areas of the Challis Creek drainage.
Streamflow

Stream flow was measured by the US Geological Survey (Station # 13299000) at a point 6.7 miles downstream of Mosquito Flat reservoir (USGS website: http://waterdata.usgs.gov/usa/nwis/sw). The period of record for the station in complete water years is 1944-1962; however in 1954 the Mosquito Flat reservoir dam was built so only the period prior will be examined here. The reservoir has a capacity of 1,054 acre feet (USGS website: http://waterdata.usgs.gov/usa/nwis/sw), and peak mean daily flow since the inception of the reservoir in 1954 through to the end of flow record in 1962 was 216 cubic feet per second (CFS).

The hydrograph for the Challis Creek station shows a very regular pattern; peaks in spring from snowmelt between 5/9 and 6/18 for the 10 years graphed. The snowmelt runoff provides not only the yearly peak, but the largest proportion of annual flow yield beginning in late April and ending in mid to late July.

Channel Conditions

Except for a small western appendage on the harvest area there is no surface flow and no incised channels within this treatment type, but instead the drainage pathways are grassy swales and meadows, some basin-like troughs with no outlet. Ground cover from grass and forbs and litter is generally excellent (>75%), overstory canopy cover varies considerably, but probably does not average much over 50%.

The drainage pattern matures in a west direction, the draws becoming deeper and side slopes sharper. The draws marked as S1 on Figure 13 have relatively broad bottoms and mature, dense growth of willow. A slight flow no more than few gallons per minute (GPM), emanates at the crossing of the Forest Service (FS) road #40091.

Challis Creek above the reservoir was estimated at 8 to 10 CFS flow, gravel/cobble substrate, stable banks and moderately high macro-invertebrates: abundant mayflies, stoneflies and caddisflies were observed. Between this point and Challis Lake stream temperatures were measured for the main stem and major tributaries as 7° to 8° C during the morning hours, beds were well imbricated gravels and cobbles, healthy populations of macro-invertebrates were noted. The large and unnamed tributary to the east of Challis Creek had flow estimated at 2.5 cubic-feet-per-seconds. Water temperature was measure in late afternoon at 11°C, but a springs emerging from foot of talus slopes were about 4° C.

Slope Conditions

Under the forest stands ground cover is ubiquitous and probably averages over 90% through live basal vegetation of grasses and forbs and leaf litter. Upper story canopy cover was estimated at between 50 and 70%. The very highest ridges and upper slopes in the west end of the project, had often scant cover, <50%, over thin and poorly developed soils. Overall ground cover is good to excellent and within expected parameters of natural conditions.

Infiltration capacity was measured in five locations, with a mini-disk infiltrometer®6. The sites had various degree of ground cover, compaction and vegetation type. Two of the sites were under lodgepole stand, with litter cover of 100%, slopes 15-30%. Two were in grassy flats or swales, compacted by cattle, slopes 2-10%, one with excellent cover the other poor. The last site was a sage brush slope with 50% cover and about 5% gradient. Results are given below in Table 11.

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6 ®The device places a constant head of water on bar mineral surface. Each test ran for 5 minutes during which the volume of the water infiltrating into the mineral soil surface (through a 2.25 cm diameter perforated metal disk) was measured every second. Infiltration capacity is a measure of a soils ability to absorb water, and stated as a rate of travel (i.e. inches/hour), typically mean in a downward direction.
Table 11. Infiltration Capacity by Site, Ground Cover, and Soil Texture

<table>
<thead>
<tr>
<th>Site Type</th>
<th>Gradient (%)</th>
<th>Ground Cover (%)</th>
<th>Soil Texture</th>
<th>Infiltration Capacity (in/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass Swale</td>
<td>15</td>
<td>90</td>
<td>silt loam</td>
<td>0.42</td>
</tr>
<tr>
<td>Lodgepole stand</td>
<td>20</td>
<td>100</td>
<td>loam</td>
<td>0.51</td>
</tr>
<tr>
<td>Grass flat</td>
<td>2</td>
<td>20</td>
<td>gravel loam</td>
<td>1.1</td>
</tr>
<tr>
<td>Lodgepole stand</td>
<td>35</td>
<td>100</td>
<td>loam</td>
<td>0.98</td>
</tr>
<tr>
<td>Sage Brush Slope</td>
<td>5</td>
<td>50</td>
<td>gravel loam</td>
<td>0.92</td>
</tr>
</tbody>
</table>

(Moser, 2014)

Road Conditions
Roads in the project watershed are overall in good condition. Forest Road 40080 drainage ditch is well maintained, no current indication of ponding or rutting, nor are rills developing on natural hill slopes below culvert relief drains. Forest Road 40246 and 404355 trails show minor rutting on steeper pitches; there are some potholes in dips, otherwise in good condition. Forest Road 40079 has shallow rutting the first ½ mile and up steep pitches, otherwise in good condition. Forest Road 40639 is seasonally closed due to elk calving area. Forest 40091 is in good condition, but for approximately ½ miles segment at the toe of a slump.

Lodgepole Fire
The Lodgepole Fire burned 2,065 acres of the project area, almost all of it in the large tributary drainage to the east of the main stem Challis Creek.

Methodology
The MFFR was analyzed by two United States Forest Service hydrologists. The hydrologists were asked to analyze effects for three proposed scenarios (Alternatives 1, 2, 3): fuels reduction with no actions, fuels reduction for proposed actions including tree removal and broadcast burning, and fuels reduction for winter logging including tree removal and broadcast burning. In addition, they were asked to make conclusions for the three scenarios in regards to five factors: 1) Project implementation and design features in relationship to federal and state laws, regulations, goals, standards, guidelines, policies and objectives (including PACFISH, Federal Water Pollution Control Act, and Executive Order 11990), 2) Project goals, objectives, standards and guidelines adherence to the Challis National Forest LRMP (USDA Forest Service, 1987), 3) Project design features and Best Management Practices (BMP) that avoid or mitigate effects of temporary road construction, and logging or prescribed burning near riparian zones, 4) Potential sediment produced by proposed project temporary roads, 5) Logging within Riparian conservation Habitat Areas (RHCA).

The project area was visited between June 27th and 28th, 2013. Several traverses were made though sections of the proposed harvest area and one through a majority section of the proposed prescribed burn area, including the area that was subsequently burned over the following month by the Lodgepole Fire. All the open roads were driven or walked, including the OHV trail that leads up to Challis Lakes. Proposed temporary roads in harvest area were included in traverses, noting forest cover and forest floor.
Incidents of perennial water were mapped as observed, channel condition and valley form also was noted.

Factors (Rules, Regulations, Standards and Guidelines)
Project implementation and design features in relationship to federal and state laws, regulations, goals, standards, guidelines, policies and objectives (including PACFISH, Federal Water Pollution Control Act, and Executive Order 11990). The MFFR Project area is within management area 21; Challis Creek watershed, which includes anadromous fish (steelhead in Morgan Creek). Specific direction, goals and objectives for this watershed water resource is to maintain or improve water quality. The Federal Water Pollution Control Act of 1972, also known as the federal Clean Water Act, provides structure for regulating pollutant discharge into this and all watersheds. Table 12 displays the Challis Creek watershed Clean Water Act water categories by stream segment.

Table 12. Challis Creek Watershed Clean Water Act Categories by Stream Segment.

<table>
<thead>
<tr>
<th>Act Category</th>
<th>Stream Segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 2-fully supporting the beneficial uses as assessed.</td>
<td>Challis Creek, from the source to the confluence of Bear Creek, approximately 4 miles downstream of the Project area, and all major tributaries of Challis Creek (Bear, Darling, Eddy, and Mill Creek).</td>
</tr>
<tr>
<td>Category 3-un-assessed waters, meant to be temporary until sufficient date and information are obtained to support a designated use attainment determination.</td>
<td>Lowest 3 miles of Challis Creek, from the confluence with Darling Creek to the confluence with the Salmon River</td>
</tr>
<tr>
<td>Category 4c-failure to meet a water quality standards but not due to a pollutant.</td>
<td>Lowest 9 miles of Challis Creek, from the confluence of Bear Creek to the confluence with the Salmon River. Note-Does not require a Total Maximum Daily Load (TMDL) which consists of the quantity of pollutants that may be delivered to a water body without violating water quality standards.</td>
</tr>
<tr>
<td>Category 5-This ranking is for water temperature that will require development of TMDL.</td>
<td>Lowest 3 miles of Challis Creek, from the confluence with Darling Creek to the confluence with the Salmon River.</td>
</tr>
</tbody>
</table>

(Moser, 2014)

Executive Order 11990, Protection of Wetlands, contains states that agencies shall minimize destruction, loss or degradation of wetlands and shall preserve and enhance their natural beneficial values. Agencies are to avoid construction in wetlands unless it is determined that there is not practicable measures are taken to minimize harm to wetlands.

PACFISH
The PACFISH amendment (USDA Forest Service 1995) applies to all anadromous-producing waters. The PACFISH Environment Assessment determined the Challis National Forest LRMP requirements be superseded by instituting Riparian Management Objectives (RMO’s) in order to “maintain or restore” watersheds. The PACFISH guidance contains Goals, RMO’s, Riparian Habitat Conservation Area’s (RHCA’s), Standards and Guidelines for riparian areas.
The purpose of an RHCA is to leave an adequate physical space around riparian areas to achieve goals and objectives.

Table 13. PACFISH RHCA Widths

<table>
<thead>
<tr>
<th>Stream Category</th>
<th>Description of Category</th>
<th>RCA Standard Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1</td>
<td>Fish-Bearing</td>
<td>Height of two site potential trees or 300 feet slope distance to either side of channel, whichever is greater</td>
</tr>
<tr>
<td>Category 2</td>
<td>Permanently flowing non-fish-bearing</td>
<td>Height of one site potential tree or 150 feet slope distance whichever is greater</td>
</tr>
<tr>
<td>Category 3</td>
<td>Ponds, lakes, reservoirs and wetlands &gt; 1 acre</td>
<td>Height of one site potential tree or 150 feet slope distance from edge</td>
</tr>
<tr>
<td>Category 4</td>
<td>Seasonally flowing or intermittent streams, wetlands &lt;1 acre, landslides or landslide-prone areas</td>
<td>a) Extent of landslide area, b) Intermittent channel to top of inner gorge, c) Intermittent channel or wetland to edge of riparian vegetation</td>
</tr>
</tbody>
</table>

(Moser, 2014)

Finally standards and guidelines for activities in or near RHCAs are outlined in the PACFISH amendment with those pertinent to this project listed below:

- Prohibit timber harvest including firewood cutting in an RHCA except in a catastrophic event (wildfire, flooding etc.) that may have resulted in degraded conditions, or when a silvicultural practice might achieve RMOs.
- Apply silvicultural practices for RHCAs to acquire desired vegetation characteristics where needed to attain RMOs.
- Out sloping of the roadway surface is preferred, except in cases where out sloping would increase sediment delivery to streams or where out sloping is unfeasible or unsafe.
- Design prescribed burn projects and prescriptions to contribute to the attainment of the Riparian Management Objectives


General Forest-wide goal is to manage riparian areas according to riparian standards and guidelines:

- Ensure that all management-induced activities meet State water quality standards, and all non-point source activities are in accordance with applicable BMPs.
- Impacts of activities may not increase fine sediment by depth (within critical reaches) of perennial streams by more than 2 percent over existing levels. Where existing levels are 3% or above new activities that would create additional stream sedimentation would not be allowed. If
these levels are reached or exceeded activities that are contributing sedimentation will be evaluated and appropriate action will be taken to bring fine sedimentation within threshold levels.

- Develop management options relevant to soil and water related improvements and/or problems. All soil and water planning will be coordinated with other resource element plans.

Project design features and Best Management Practices (BMP) that avoid or mitigate effects of temporary road construction, and logging or prescribed burning near riparian zones

The Design Features section of this document lists design features and Best Management Practices (BMP) that avoid or mitigates effects of temporary road construction, and logging or prescribed burning near riparian zones. BMPs are listed in the Idaho Administrative Code (IDAPA), Chapter 20, rules pertaining to the Idaho Forest Practices Act (Title 38, Chapter 13, Idaho Code), administered by the Idaho Department of Lands. The Design Features section also addresses the IDAPA Chapter 20 requirements and recommended temporary road construction, landing placement and design, skid trail water bar spacing (in feet), and prescribed burning specific to the MFFRD project.

Potential sediment produced by proposed project temporary roads

The Design Features section of this document lists design features and Best Management Practices (BMP) that avoid or mitigate effects of temporary road construction. BMPs are listed in the Idaho Administrative Code, Chapter 20, rules pertaining to the Idaho Forest Practices Act (Title 38, Chapter 13, Idaho Code), administered by the Idaho Department of Lands.

Logging within Riparian conservation Habitat Areas (RHCA).

As stated above PACFISH guidance for Riparian RHCA’s (Standards and Guidelines) riparian areas will be adhered to in project implementation and activities. The purpose of an RHCA is to leave an adequate physical space around riparian areas to achieve goals and objectives set forth for riparian areas action/activity implementation. The Design Features section of this document lists design features and Best Management Practices (BMP) that avoid or mitigate effects of temporary logging near riparian zones. BMPs are listed in the Idaho Administrative Code, Chapter 20, rules pertaining to the Idaho Forest Practices Act (Title 38, Chapter 13, Idaho Code), administered by the Idaho Department of Lands. In addition, the Challis National Forest LRMP and Silviculture treatment plans specific to MFFR project will provide additional direction for RHCAs.

3.6.2 Alternative 1 – No Action

Implementing the no action alternative would not result in any indirect or direct effects because there are no proposed actions associated with this alternative. Although there would be indirect and direct effects from not taking actions due to the following:

- It is fair to assume that canopy cover may even increase over time to a minor extent. The existing and/or increasing canopy cover, crown closure and fuel loading leads to an increased probability of wildfire.
- The watershed would remain vulnerable to a large fire conflagration (Although this would depict 100 percent lethal burn severity across the drainage, differing winds and weather conditions throughout any given 24-hour period would lessen the percent of lethal burn severity to an average of 43 to 61 percent.). The potential catastrophic loss of canopy and ground cover leaves potential for mass wasting by sheet flow over the surface, and in some certain cases by landslip on sufficiently steep slopes with moderately deep or deep soils.
- The portion of the Lodgepole Fire that burned within the project area (2,065 acres) eliminated about 48 percent of ground and canopy cover. The total coverage of the Lodgepole Fire within the proposed treatment area was about 20%, which presumably leaves the remainder in a vulnerable state.
Summary of Effects

Although an alternative with no activities associated does not, by definition, have any direct, indirect, or cumulative effects changes in forest structure in the project area have significantly increased the potential for uncharacteristic fire behavior. A landscape-scale wildland fire during summer drought and extreme weather conditions is a plausible event in the near-term as a consequence of not implementing hazardous fuels reduction activities. The catastrophic loss of canopy and ground cover leaves potential for mass wasting by sheet flow over the surface, and in some certain cases by landslip on sufficiently steep slopes with moderately deep or deep soils.

3.6.3 Alternatives 2 and 3 - Proposed Action and Winter Logging

Direct/Indirect

The direct effects of vegetation manipulation by mechanical means is loss of cover (either over story or forest floor, or both), and disturbance of the soils such that infiltration capacity of precipitation is adversely affected. This last effect is largely considered to be from compaction of the soil by heavy equipment. Table 14 below provides the approximate percentage of canopy reduction from the proposed treatments and the 2013 Lodgepole Fire.

Table 14. Canopy Reduction from Proposed Treatments.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Acres of treatment (alt. 2 and 3)</th>
<th>Initial canopy reduction (%)</th>
<th>Canopy reduction as % of Challis Creek watershed area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thinning</td>
<td>1,460</td>
<td>30</td>
<td>3.5</td>
</tr>
<tr>
<td>Aspen Restoration</td>
<td>224</td>
<td>100</td>
<td>3.2</td>
</tr>
<tr>
<td>Overstory Removal</td>
<td>48</td>
<td>100</td>
<td>0.4</td>
</tr>
<tr>
<td>Prescribed Burning</td>
<td>7,565*</td>
<td>15</td>
<td>5.0</td>
</tr>
<tr>
<td>Lodgepole Fire (2013)</td>
<td>2,065**</td>
<td>443</td>
<td>3.8</td>
</tr>
<tr>
<td>Roads, Existing and Temporary for project access</td>
<td>75</td>
<td>100</td>
<td>0.6</td>
</tr>
<tr>
<td>Total Canopy Reduction</td>
<td></td>
<td></td>
<td>16.1</td>
</tr>
</tbody>
</table>

*--Acres within burn unit outside of Lodgepole Fire perimeter
**--Total acres actually burned within Lodgepole Fire perimeter in all severities classes (Moser, 2014)

Evapotranspiration and Flow Response to Canopy Reduction

There is evidence that canopy reduction from uplands would lead to increase runoff, during snow melt, both in total yield and peak flow (Troendle & King, The effect of partial and clearcutting on streamflow at Deadhouse Creek, 1987) (Troendle, Wilcox, Bevenger, & Porth, 2001). Also the larger proportion of snow melt occurs while soil temperatures are cold enough to suppress plant activity. Recent and reoccurring studies indicate the following potential impacts on stream flow from canopy reduction (summary of studies, (Bosh & Hewlett, 1982) (Brown, Zhang, McMahon, Western, & Vertessy, 2005)):

- Reducing canopy virtually always increases runoff
- Canopy reduction of <20% does not have measurable effects
- Effects are greatest in the runoff months (for the project area the largest proportion of annual flow yield beginning in late April and ending in mid to late July).
The duration of effects depends on the nature of the treatment and site potential for re-growth. Depending on climate, recovery from effects is usually within five years. By the end of the term soil moisture flux studies show new vegetation largely uptakes available water and evapotranspiration may even exceed initial pre-cut stand condition (Simonin, Kolb, Montes-Helu, & Koch, 2006) (Simonin, Kolb, Montes-Helu, & Koch, 2007). For perennial conversion, however, it may take longer to ascertain long-term average.

Returning to Table 14 there would be a 12.1 percent reduction in the Challis Creek watershed canopy area from proposed treatments. Adding existing roads and proposed temporary roads for project access (approximately 75 acres) is another 0.6 percent of potential canopy loss. About 245 acres of the watershed has received harvest treatments in the past 25 years, but it may be assumed that by the time of implementation of an action alternative that sufficient time has passed for regrowth to mitigate effects to soil moisture. Table 14 also displays the portion of the watershed canopy reduced by the 2013 Lodgepole Fire. Measured from BARC7 imagery with assumptions on eventual mortality it is about 443 acres or 3.8 percent of the total watershed.

These calculations bring the total canopy reduction to about 16.5% after implementation of the proposed project, which is below the approximate threshold of 20% found in studies of harvested watershed for measurable effects from canopy reduction/loss.

Erosion Effects from Removal of Trees, and Prescribed Fire
Outside of a wildfire environment, surface erosion is rare in forested upper hill slopes even within heavily roaded areas. Generally, soil losses are considered more extreme on steep slopes when groundcover is lost from disturbance (Elliot, Hall, & Graves, 1998). Secondly, ground laid bare by harvest, or by burning on steep slopes around low order hillside draws may be susceptible to overland flow and debris flow initiation in draws. PACFISH guidelines for stream buffers will be strictly adhered during project implementation as research on the effect of streamside buffers has found consistent results in terms of maintaining water quality (Castelle, Johnson, & Conolly, 1994) (Castelle & Johnson, 2000) (Fischer & Fischenich, 2000). Buffers of any vegetative type of about 30 meters will remove 80-90% of nutrient and sediment load, widths of 100 feet will suffice in capturing 90%, unless dissected by pre-existing channels that concentrate flow.

Effects of Riparian Thinning on Temperature and Sediment
Harvesting of trees can increase solar radiation in the riparian zone as well as wind speed and exposure of air advection from clearings (Johnson & Jones, 2000) (Moore, Spittlehouse, & Story, 2005). Moore et al found through a comprehensive literature review that riparian buffers of about 1 tree height will largely mitigate these effects presumable depending on the potential height of trees in the area. Moore et al also found that rises in temperature were unlikely to produce substantial change in larger main stem channels unless the tributaries constituted a large proportion of total flow. Small increases in temperature gain in open conditions were lost soon after entering forest cover again.

Potential for Mass-wasting
Potential erosion is highest on steep slope gradients and where soils lack protective groundcover, largely within the Lodgepole Fire area. Storms in the realm of 1 to 5 year recurrence can produce erosive overland flow form the reduced ability of the soil to uptake rainwater, lack of canopy protection to intercept rainfall and lack of forest floor to regulate infiltration.

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7 A Burned Area Reflectance Classification (BARC) is a satellite-derived data layer of post-fire vegetation condition. The BARC has four classes: high, moderate, low, and unburned.
Cumulative Effects

The analysis for this project examined the cumulating impacts of past and future actions with the proposed action alternatives. The Salmon-Challis NF utilized the Equivalent Treatment Area Calculator (ETAC) computer program which is based on the Equivalent Clearcut Area (ECA) concept (Ager & Clifton, 2005). The EAC method standardizes management types of loss of leaf or basal area and assesses runoff response as peak flows and total water yields (an index type tool presenting relative results and not in absolute terms).

The cumulative effects area chosen for the analysis is the Challis Creek Watershed encompassing the project treatment area, with an outflow point about 2 miles below the Mosquito Flats reservoir (Figure 13). Temporary road construction would be 3.0 miles in the harvest/cutting section of the project treatment area and were determined to have a steady, unvarying, effect as they will be decommissioned which will include recontouring and seeding. All temporary roads and landings constructed for the project would be monitored for 3-5 years for invasive plants. None of the proposed routes for temporary roads are within perennial RHCA or cross perennial RHCA.

Table 15. Equivalent Clearcut Area (ECA) Results for MFFR Project Area.

<table>
<thead>
<tr>
<th>Event</th>
<th>2013, current</th>
<th>2014,1st yr. of project</th>
<th>2015, 2nd yr.</th>
<th>2016, last yr.</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lodgepole Fire</td>
<td>4.81</td>
<td>3.85</td>
<td>2.89</td>
<td>1.93</td>
<td>0.00</td>
</tr>
<tr>
<td>Project prescribed burn</td>
<td>0.00</td>
<td>1.21</td>
<td>2.17</td>
<td>2.89</td>
<td>0.240</td>
</tr>
<tr>
<td>Past harvest</td>
<td>0.00</td>
<td>0.07</td>
<td>0.04</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td>Proposed harvest</td>
<td>0.00</td>
<td>1.68</td>
<td>3.25</td>
<td>6.79</td>
<td>4.73</td>
</tr>
<tr>
<td>Permanent system roads</td>
<td>0.81</td>
<td>0.81</td>
<td>0.81</td>
<td>0.81</td>
<td>0.81</td>
</tr>
<tr>
<td>Temporary roads</td>
<td>0.00</td>
<td>0.09</td>
<td>0.09</td>
<td>0.09</td>
<td>0.00</td>
</tr>
<tr>
<td>Total ECA%</td>
<td>5.72</td>
<td>7.62</td>
<td>9.25</td>
<td>12.53</td>
<td>5.78</td>
</tr>
</tbody>
</table>

(Moser, 2014) The proposed action for harvest and prescribed burn was assumed here to occur over three years, which may be taken as a minimum term (project scoping notice). From the above table it can be seen that total ECA % rises for each year of implementation (2014-2016) until the full proposed acreage is managed, then declines thereafter reaching a level approximate to the current condition 4 years after implementation in 2020.

Various recovery rates are assumed, consistent with results of research in northwest region and personal observation. For example a prescribed fire was given a recovery rate of 10% per year that of a partial cut is 7% per year, with full recovery in 10 years.

Summary of Effects

The effect of the Lodgepole Fire probably offers the greatest risk of exacerbated flow peaks and yields or sediment delivery to channels and has been excluded from further treatment within the project area. The proposed harvest and prescribed burn do not constitute canopy or ground cover reduction in of themselves to expect measureable or observable increases of flow peaks and yields as can be determined from literature review of research of effects of harvesting. Results of the ECA modeling come to similar conclusions. While total effects, as percent ECA may approach the threshold values of 15% for one year
of implementation thresholds are based on averaged results of research similar to that for canopy reduction and water yields. Thresholds are not hard values but a level of activity for which it should serve as a warning that significant effects might be expected. By the same token should the project area not be treated and experience another wildfire of the same proportion of high intensity as the Lodgepole had over a portion of the project area, there would almost certainly be a very high probability of large measureable effects. RHCAs would be no treatment areas. Research has shown that riparian buffers similar to or less than the standard PACFISH RHCA prescribed in this project are adequate to remove/filter up to 90% of sediment and nutrients from activity area reaching the channels. The three miles of temporary roads proposed do not cross RHCA for perennial streams. These roads would be decommissioned at the completion of the project which would include re-contouring and seeding.

3.7 Non-Forested Vegetation, Noxious Weeds and Invasive Plants

3.7.1 Affected Environment - Rangelands

The action area for non-forested vegetation is the Upper Challis Creek HUC 6 watershed drainage extending from junction of Challis Creek with Bear Creek, west then north to the head waters of Challis Creek about 20,645 acres. (Figure 5). The action area for range (grazing) is the limited to the Challis Creek Cattle and Horse Allotment Boundary about 26,124 acres in size. Action area elevation ranges from 5,100 feet on the valley floor to 10,600 feet at Twin Peaks. The topography ranges from gentle slopes to benches and bottomland to near vertical headwalls in cirque basins. Much of the high country above 7,000 feet has been glaciated, with lakes form in those glacial cirques.

Non-forested vegetation consists of roughly 881 acres of the proposed 9,630 project area or 9.5%. The balance of proposed treatment area is forested covered communities with minor amounts represented by water, and barren rock. The Table 16 shows the acres of non-forested vegetation with the management area, action area, and proposed project area (USDA Forest Service, 2013). As is similar across the forest, fire suppression has allowed for denser conifer stands and conifer expansion into aspen and shrub steppe sites.

Of the 26,211 acres in the Challis Creek Horse and Cattle Allotment there is 4,737 acres of National Forest Service lands categorized as capable of producing sufficient forage for this allotment. Of the 4,737 acres 1,704 acres occur in the project area and may be altered or enhanced by the proposed actions, depending on treatment. These are displayed in Table 17.

Table 16. Acres of Non-Forested Vegetation Communities within the MFFR Project Action and Management Area #21.

<table>
<thead>
<tr>
<th>Vegetative Community</th>
<th>Acres with in Proposed Project</th>
<th>% of Proposed Project Area</th>
<th>Acres within Action Area</th>
<th>% of Action Area</th>
<th>Acres within Management Area #21</th>
<th>% of Management Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bunchgrass/Fescue</td>
<td>676.8</td>
<td>7.0</td>
<td>867.9</td>
<td>0</td>
<td>443.1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Bunchgrass Grassland</td>
<td>0</td>
<td>0.0</td>
<td>6.2</td>
<td>0</td>
<td>4010.7</td>
<td>3</td>
</tr>
<tr>
<td>Mountain Big Sage</td>
<td>34.2</td>
<td>0.4</td>
<td>723.6</td>
<td>0</td>
<td>16007.3</td>
<td>12</td>
</tr>
<tr>
<td>Mountain Mahogany</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>29.2</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>
Table 17. Capable Acres for Grazing in MFFR Project Treatment Areas and Challis Creek Cattle and Horse Allotment.

<table>
<thead>
<tr>
<th>Capable Vegetation Group</th>
<th>Capable Acres within Mechanical Treatment Area</th>
<th>Capable Acres within the RX Treatment Area</th>
<th>Percentage of Capable Acres for Proposed Project of Allotment Acres</th>
<th>Capable Acres within Challis Creek C&amp;H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspen/Conifer</td>
<td>0</td>
<td>1.01</td>
<td>3</td>
<td>34.02</td>
</tr>
<tr>
<td>Bunchgrass Grassland</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.04</td>
</tr>
<tr>
<td>Bunchgrass/Fescue</td>
<td>3.64</td>
<td>133.39</td>
<td>71</td>
<td>192.14</td>
</tr>
<tr>
<td>Cottonwood</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>83.73</td>
</tr>
<tr>
<td>DF/Lodgepole-Gentle</td>
<td>939.39</td>
<td>536.10</td>
<td>80</td>
<td>1,846.32</td>
</tr>
<tr>
<td>Mountain Big Sage</td>
<td>13.93</td>
<td>.31</td>
<td>1</td>
<td>1,092.31</td>
</tr>
<tr>
<td>Mtn. Big Sage w/conifer</td>
<td>77.82</td>
<td>29.77</td>
<td>9</td>
<td>1,186.35</td>
</tr>
<tr>
<td>Riparian Shrub</td>
<td>1.61</td>
<td>.86</td>
<td>23</td>
<td>10.96</td>
</tr>
<tr>
<td>Threetip Sage</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>23.36</td>
</tr>
<tr>
<td>Wyoming Big Sage</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>268.36</td>
</tr>
<tr>
<td>Total</td>
<td>1,036.40</td>
<td>701.37</td>
<td>N/A</td>
<td>4,737.60</td>
</tr>
</tbody>
</table>

3.7.2 Affected Environment - Noxious Weeds and Invasive Plants

The Forest Service defines *noxious weeds* as those plant species designated as noxious by the Secretary of Agriculture or by the responsible State official. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease and being native or new to or not common to the United States or parts thereof. The Forest Service policy defines *invasive plants* as those species meeting the following two criteria: It is nonnative to the ecosystem under consideration, and its introduction causes or is likely to cause economic or environmental harm or harm to human health.

Noxious weeds are known to occur within the project, watershed, and Management Area #21 and shown in
Table 18. (USDA Forest Service, 2013) There are eight known noxious weeds that currently are present in the Management Area #21. Those species are: butter and eggs (*Linaria vulgaris*), Canada thistle (*Cirsium arvense*), common tansy (*Tanacetum vulgare*), leafy spurge (*Euphorbia esula*), nodding plumeless thistle (*Carduus nutans*), oxeye daisy (*Leucanthemum vulgare*), rush skeletonweed (*Chondrilla juncea*), spotted knapweed (*Centaurea stoebe ssp. micranthos*), and sulphur cinquefoil (*Potentilla recta*). Of these eight species only spotted knapweed is currently present in the proposed treatment area (3.94 acres) and is recognized as a single know infestation around the boat launch and campground at Mosquito Reservoir.
Table 18. Areas of Noxious or Invasive Species within the MFFR Project Action Area and Management Area #21.

<table>
<thead>
<tr>
<th>Noxious or Invasive Species</th>
<th>Acres with in Proposed Project</th>
<th>% of Area in Proposed Project</th>
<th>Acres within Action Area</th>
<th>% of Action Area</th>
<th>Acres within Management Area #21</th>
<th>% of Management Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>butter and eggs</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.73</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Canada thistle</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>48.75</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>common tansy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.12</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>leafy spurge</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.10</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>nodding plumless thistle</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>17.75</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>oxeye daisy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>.008</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>spotted knapweed</td>
<td>3.94</td>
<td>&lt;.001%</td>
<td>6.43</td>
<td>&lt;.001%</td>
<td>874.89</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>sulphur cinquefoil</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.34</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3.94</strong></td>
<td><strong>&lt;.001%</strong></td>
<td><strong>6.43</strong></td>
<td><strong>&lt;.001%</strong></td>
<td><strong>945.81</strong></td>
<td><strong>&lt;.01%</strong></td>
</tr>
</tbody>
</table>

For non-native invasive plants or noxious weeds present in a proposed project area several factors need to be considered:

- Species of noxious weed or invasive plants, size and distribution of infestations, and location of infestations.
- The occurrence of new (introduced) noxious weed or invasive plants, their species, size, distribution and location of new infestations.
- The continuing challenge they represent to vegetation communities and recreation resources.
- Rangeland may be considered functional-at-risk due to the aggressive nature of these species in both pristine and disturbed landscapes.
- The use of an integrated pest management approach, which includes chemical, biological, and mechanical treatment, to control the spread of noxious weeds.

The Challis-Yankee Fork Ranger District has an active noxious weed and invasive treatment program. The Ranger District participates in a coordinated weed management program with Custer County, the State of Idaho, other federal agencies, and private landowners that manage to ensure Best Management Practices occur including:

1. Ensure noxious weed prevention and control on all Forest Service lands.
2. Minimize ground disturbance and bare soil
3. Enforces weed free hay special order to feed livestock on National Forest System lands.

The Challis-Yankee Fork Ranger District uses an integrated pest management approach, which includes chemical, biological, and mechanical treatment, to control the spread of noxious weeds.

**Affected Invasive Species**

The action area for noxious weeds and invasive species is the same as the non-forested vegetation listed above (Upper Challis Creek HUC 6) the Challis National Forest LRMP (Forest Plan) Management Area.
Table 16 shows the acres of non-forested vegetation with the management area, action area, and proposed project area (USDA Forest Service, 2013) to be considered for affected environment and environmental consequences for noxious weeds and invasive species for this project.

As noted spotted knapweed is currently the only invasive species present in proposed treatment area (3.94 acres) and is recognized as a single know infestation around the boat launch and campground are at Mosquito Reservoir. This single infestation is not a monoculture or dominated by the noxious weed, but interspersed with native vegetation. Its presence is consistent with findings that most weeds species are limited to or within close proximity to travel corridors or places of increase recreational activity which Mosquito Reservoir boat launch provides. Significance of keeping it to one infestation area is due to past treatment and continuing monitoring that has taken place to control the spread.

**Methodology**

The following measure for non-forested vegetation was developed from both internal input and public scoping to analyze the effects of No Action and Proposed Action Alternatives and mitigation measures that may be taken to reduce the potential effects. These include:

- Anticipated changes in non-forested vegetation - expressed in % change in acres of non-forested vegetation communities types
- Anticipated changes in noxious and invasive plants - expressed in % change in acres of noxious and invasive plants
- Anticipated changes in Capability grazing acres - expressed in % change in acres of capability acres.
- Before the project begins the one known weed infestation (spotted knapweed) will be treated to reduce the amount of seed that is present. This should occur prior to any entry of harvest machinery.
- Adherence to Executive Order 13112 (Invasive Species): The proposed action compiles with this order directing the Federal Agencies, whose actions may affect the status of invasive species to prevent the introduction of these species, and detect and respond rapidly to, and control populations of, such species in a cost-effective and environmentally-sound manner as appropriation allow.
- Adherence to -Challis NF Forest Plan Direction, Section B (IV-11), Subsection 3, 9, 11 of Part B, and Section C (IV-34), Subsection 3 for range and riparian management.
- Prior to the implementation of activities existing population of spotted knapweed should be treated, and annually for the life of the project, to minimize spread from this source.
- Reestablishing vegetation on disturbed areas after the project activities are completed will reduce the level of invasive plants for establishment and level of competition for site elements.
- The weed treatment program on the Challis-Yankee Fork Ranger District will continue to make high use recreation areas and travel routes a priority for treatment to control existing infestations and reduce the potential for any new ones.
- Weed treatment and monitoring within the project area will continue through the life of the project under the direction of the Salmon-Challis Noxious Weed Management Program.
- Continued monitoring of allowable levels of use (grazing) by livestock on rangelands will minimize the ground disturbance in these grazed areas.
3.7.3 Alternative 1 - No Action

Direct and Indirect Effects of No Action
Implementing the no action alternative would allow the existing non-forested vegetative conditions to continue naturally evolving across the project area until an agent of change disrupts the process. However the current and future potential for uncharacteristic fire behavior at the landscape level poses a high level of risk for the Mosquito Flat WUI, firefighters responding to Wildland fires and public recreationist and landowners in the Mosquito Flat area. This is the context for which the consequences of adopting Alternative 1 will be evaluated for this project.

- During a fire event non-forested communities would experience a range of fire intensities, with mixed effects to grass, forb, and shrub components of the upland communities.
- Non-forested communities and riparian zone associated with the forested ecosystem would likely experience high intensity, short duration burns as wildfire move quickly through these fine fuels.
- Initially upland non-forested communities will continue their current successional processes. Mountain Big sagebrush communities will continue to increase in shrub canopy lessening the herbaceous understory. (Rust, 2006)
- Mountain Big sagebrush communities with conifers present will continue to encroach further into the pure sagebrush stands and eventually shade out the sagebrush through normal competition.
- In the continued absence of fire, these landscapes are likely to become more homogeneous as trees dominate much of the landscape”.
- Riparian communities would experience similar effects with a minor difference in the ability for riparian shrubs to return to pre-fire conditions faster than other communities.
- Noxious weed treatment and monitoring within the project action area will continue to maintain current invasive populations with some reduction in weed densities under the direction of the Salmon Challis Noxious Weed Management Program.
- Spotted knapweed is not likely to survive very severe burns but moderate to low intensity burns will allow for this species to increase its population size on the landscape. (USDA Forest Service Rocky Mountain Reserach Station, Fire Sciences Laboratory, 2001)
- Increased acreages of noxious weeds would require more monitoring and treatment of these species within the action area.
- Community types that represent capable acres would transition from herbaceous to more dominated shrub or conifer shrub communities along their normal successional paths, decreasing current capable acres in the allotment.
- Post fire herbaceous communities would increase as they are the colonizers and shrub and/or conifer dominated vegetation types would be reduced.

Cumulative Effects of No Action
Past and present, ongoing, activities for the non-forested and riparian portions of the 20,246 acre project action area included livestock grazing, noxious weed control, motorized recreation, and camping. Past and present, ongoing, activities for the capable acres in the Challis Creek C&H Allotment action area  is limited to livestock grazing.

- Community types that represent capable acres would transition from herbaceous to more dominated shrub or conifer shrub communities along their normal successional paths, decreasing current capable acres in the allotment.
- Post fire herbaceous communities would increase as they are the colonizers and shrub and/or conifer dominated vegetation types would be reduced.
- Riparian vegetation would continue on their current successional path with grazing.
• Defer livestock grazing on range and wildlife habitat improvement project areas for a sufficient period of time, following treatment, to allow for proper vegetation response.
• Noxious weed control has kept noxious weeds from infesting large acreages of non-forested and riparian areas within the action area and will continue to keep infestations isolated to the current travel corridors while slowly reducing the size of the infestations.
• Post fire spotted knapweed (and other introduced species populations) could take advantage of burned areas and increase their infestation further onto the landscape beyond the travel corridors. Where these potentially new infestation occur in riparian areas waterways could provide a new vector of dispersal to other areas.
• Post fire motorized travel and dispersed camping within the project area will be difficult to control making areas that are now difficult to get to more accessible to these recreational uses.
• Unmonitored/excessive livestock grazing has the potential for creating ground disturbance and seed dispersal that would allow for noxious weeds to establish new populations or increase the size of existing infestations.
• With a potential increase in noxious weeds after recovery from a fire incident, seed transport by livestock could become a concern on this allotment requiring increased monitoring and treatment of the species.
• There are no known other activities expected to occur in the foreseeable future within the project action area.

Summary of Effects
Implementing the no action alternative would not result in any indirect or direct effects, as there are no proposed actions. Natural processes would allow the existing non-forested vegetative conditions to continue naturally evolving across the project area until an agent of change disrupts the process; although there would be indirect and direct effects from not taking action.

3.7.4 Alternatives 2 and 3 - Proposed Action and Winter Logging
These action alternatives implement a variety of management activities that meet the purpose and need of this project. This project targets forest vegetation communities that have significantly departed from their historical range of variation not sagebrush grassland. As shown in Table 16, only the Douglas-fir /Sagebrush vegetation type may be impacted by reducing encroachment of conifers which represents two percent of the proposed project area. Specifically, these alternatives would implement the following management actions:

• Implement a thinning cut across approximately 1,460 acres with chainsaws, additionally using mechanical ground-based equipment such as feller-bunchers or processors on up to 742 acres of the total 1,460 acres.
• Implement an aspen restoration cut across approximately 224 acres using chainsaws
• Implement an overstory removal cut on approximately 48 acres
• Implement a broadcast burn across 7,565 acres, which includes areas affected by the tree cutting activities described above

Figure 7 identifies specific treatments and their locations in the project area. In considering the effects of the alternatives the following effects were considered:

1. Effects to upland and riparian non-forested vegetation attributed to proposed vegetative treatments
2. Effect of noxious weeds attributed to proposed vegetative treatments
3. Effect of vegetative treatment in relationship to disruption of active grazing on the Challis Creek Cattle and Horse Grazing Allotment.

There are some minor changes to the action if the activities occur in the winter time (Alternative 3). Changes include:

- Slope limitation of 35% for feasible winter logging activities would result in a reduction in acres treated by mechanical harvest
- Increase in hand treated acres a reflection of slope limitation
- Snowplowing for access
- Access management of winter haul routes (may require full closure order)
- Potential soil disturbance is reduce due to operating on frozen ground

Actions that are not change between Alternative 2 and 3 include:

- Timing of Rx burning
- Need for temporary roads, but may be reduced based on slope consideration for winter logging
- Timing of construction of the temporary roads
- Timing to complete hand treated areas
- Reseeding of disturbed location and temporary roads would still be required post-harvest

**Direct and Indirect Effects**

The effects of the proposed treatments on non-forested vegetation within the project area will be minimal in scale. Project proposal would target forested vegetation to remove encroachment of Douglas-fir from sagebrush community through mechanical or prescribe fire and return communities to their historical range. The potential for direct and indirect effects includes the following:

- A decrease in forested vegetation acres and an increase in sagebrush community types across the project area. We anticipate that 107 acres of Douglas-fir sagebrush community will be converted to grass or forbs immediately after prescribe fire.
- Potential for increase in available capable acres for grazing across the allotment by opening up or removal of forested canopies either through prescribe fire or mechanical methods.
- Proposed prescribed fire treatments may result in natural backing of burn into riparian areas, increasing acres of this vegetation community type.
- Defer livestock grazing on range and wildlife habitat improvement project areas for a sufficient period of time, following treatment, to allow for proper vegetation response.
- Potential for the current level of spotted knapweed to increase across the project area.
- The potential for noxious weeds to spread along proposed project travel routes. To minimize the potential and level of affect the *USDA Forest Service Guide to Noxious Weeds Prevention Practices* (USDA Forest Service, 2001) will be implemented throughout the life of this project, therefore potential for spread of spotted knapweed will greatly decrease. In addition, all operational equipment will be thoroughly cleaned prior to entering the project area.
- In mechanical treatment units some level of soil disturbance will occur as landings, temporary roads, and skid trails are employed to remove forest product. The anticipated level of disturbance is roughly 6% or 75 acres. The duration of these activities may occur for period of up to eight years. For the hand treatment only units no soil disturbance is expected.
- In prescribe fire treatment areas a range of soil disturbance will occur based on intensity of the fire. Where high intensity fire occurs there would be more exposed bare soil, presenting a seed bed for propagation of noxious weed (if present). Where intensity of fire is less than high, exposed bare soil would be limited and may be covered by a duff layer in the forested communities.
Cumulative Effects of Proposed Action Alternatives
Past and present, and ongoing activities for the project area include motorized recreation and livestock grazing. The potential for cumulative effects includes the following:

Motorized travel beyond designated travel routes has the potential to spread noxious weeds and invasive plant species.

Noxious weed and invasive species infestations along travel corridors will continue to be an issue with the increased potential for noxious weed seed distribution from motorized vehicles. Livestock grazing has the potential for creating ground disturbance that would allow for noxious weeds to establish new populations or increase the size of existing infestations.

Summary of Effects
Effects to upland and riparian non-forested vegetation may range from decrease in forested vegetative acres, increase in available capable acres for grazing, potential increase in riparian acres, a sufficient rest period for grazing allotment areas that have prescribed fire treatment; with associated interruption for permittees and the need to find alternative ground to graze for the required rest period, which may affect them financially. Effects to noxious weeds may range from potential increase in current spotted knapweed infestation, potential for spread of noxious weed and invasive species (that are present in area) along travel routes and in areas of soil disturbance. Potential weed and invasive species effects will be minimized through adherence to USDA Forest Service Guide to Noxious Weeds Prevention Practices (USDA Forest Service, 2001), weed treatments and monitoring prior to, during and following project implementation.

3.8 Recreation and Roadless

3.8.1 Affected Environment

Methodology
This analysis was conducted using ArcMap and relevant Geographic Information System (GIS) data layers from the Salmon-Challis National Forest, including trails, roads, recreation sites, Idaho Roadless Area’s and ROS classes. On-line visitor information provided by the Salmon-Challis National Forest and other local organizations was used as an overview of the recreation opportunities and trends within the analysis area. A review of existing law, regulation and policy relevant to recreation resources within the project area was conducted and relevant sections of the Forest Plan and Forest Service Handbooks, Idaho Roadless Rule are referenced.

The analysis also used field visits and compared and contrasted the time of year the treatments would occur in space and time. The assessment has been established through professional judgement and subject matter experts.

Idaho Roadless Area Analysis
The purpose of the analysis on the roadless resource is to disclose potential effects to roadless characteristics and wilderness attributes and determine if, or to what extent it might affect future consideration for wilderness recommendations. This analysis focuses on the potential effects of project activities on roadless characteristics as defined in 36 CFR Part 294, Subpart C – Idaho Roadless Area Management and wilderness attributes as defined in the Forest Service Handbook (FSH) 1909.12 (72.1) by comparing the alternatives to the existing baseline.
Table 19 shows the crosswalk between the wilderness attributes identified in Forest Service Handbook 1909.12 and the 1964 Wilderness Act; and the roadless area characteristics. The wilderness attributes listed above and as displayed in the crosswalk table below are the sole evaluation criterion used in this analysis for disclosure of effects to roadless area characteristics in the project area.

### Table 19. Crosswalk between Wilderness Attributes and Roadless Area Characteristics.

<table>
<thead>
<tr>
<th>Wilderness Attributes</th>
<th>Roadless Area Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural</strong> (ecological systems are substantially free from the effects of modern civilization and generally appear to have been affected primarily by forces of nature)</td>
<td>High quality or undisturbed soil, water, and air; Sources of public drinking water; Diversity of plant and animal communities; Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land; Reference landscapes</td>
</tr>
<tr>
<td><strong>Undeveloped</strong> (degree to which the area is without permanent improvements or human habitation)</td>
<td>Natural appearing landscapes with high scenic quality</td>
</tr>
<tr>
<td><strong>Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation</strong></td>
<td>Primitive, semi-primitive non-motorized and semi-primitive motorized classes of dispersed recreation</td>
</tr>
<tr>
<td><strong>Solitude:</strong> opportunity to experience isolation from the sights, sounds, and presence of others from the developments and evidence of humans</td>
<td></td>
</tr>
<tr>
<td><strong>Primitive and unconfined recreation:</strong> opportunity to experience isolation from the evidence of humans, to feel a part of nature, to have a vastness of scale, and a degree of challenge and risk while using outdoor skills.</td>
<td></td>
</tr>
<tr>
<td><strong>Special Features and Values</strong> (capability of the area to provide other values such as those with geologic, scientific, educational, scenic, historic, or cultural significance)</td>
<td>Traditional cultural properties and sacred sites; and Other locally identified unique characteristics.</td>
</tr>
<tr>
<td><strong>Manageability</strong> (the ability of the Forest Service to manage an area to meet size criteria and the elements of wilderness)</td>
<td>No criteria</td>
</tr>
</tbody>
</table>

### 3.8.2 Alternative 1 - No Action

#### Direct and Indirect Effects

The no action alternative would have no direct effects to recreation opportunities. The long term indirect effects to recreation, roadless and wilderness resources would be related to ecosystem restoration and changes in environment within the project area that influence the recreation opportunities and setting. The indirect long term effect of no action could change recreational user experience and change the natural successional setting within the project area.
Alternative 1 long term effects may result in indirect effects to recreation and the Challis Creek Idaho RA as the risk of severe wildfire continues to increase, potentially resulting in changes to the recreation setting or scenic quality of the project area. Taking no action would not impact the wilderness potential of the Idaho RA.

There would be no direct effect to the outstanding opportunities for solitude from taking no action. If no action is taken, there is a possibility that unnaturally intense fire would occur that would have indirect impacts to the primitive and unconfined recreation opportunities that are dependent, in part, on the natural setting and scenic qualities of the area. Effects to natural, undeveloped, special features, and manageability would not change.

**Cumulative Effects**
There are no known cumulative effects to recreation from taking no action

**Summary of Effects**
Taking no action would have no direct effects to the recreation, roadless or wilderness attributes within the project area. The long-term indirect effect could change recreational user experience with the continued suppression of natural fire regimes.

### 3.8.3 Alternative 2 – Proposed Action

**Direct and Indirect Effects**
The proposed spring or fall prescribed burns over a three to five year period could directly impact recreation activities occurring in the project area. The prescribed burning and mechanical treatment activity may require temporary trail closures or limited access to the area to protect public safety. In addition, the recreating public may choose to avoid areas during the project. These effects would be both temporary and short term. Public notification at trailheads, on forest websites and in the local media would allow adequate notice for those planning trips into the area to adjust their plans accordingly. Commercial outfitting in the area during the prescribed burns and mechanical treatment may also be directly impacted by limited access or trail closures. Notifying the local outfitter prior to the project activity would reduce any potential impacts.

Smoke in the air during the prescribed burns and noise from heavy machinery may have a temporary direct impact to the quality of the recreation experience within and adjacent to the project area by temporarily reducing air quality and visibility.

There is a potential for prescribed fire to impact forest trails and roads by indirectly causing increased run-off and erosion or debris on the trails. There may be an increased incidence of burnt trees falling across the trails for several years following the prescribed burns. The trails within the project area would continue to be maintained by the Challis-Yankee Fork Ranger District. Trail 147 and 091 would be addressed as needed based on trail conditions.

The long term indirect effects of the proposed action, including ecosystem restoration and a reduction in the risk of negative impacts from severe wildfire have the potential to indirectly benefit recreation by maintaining the primitive and unconfined recreation opportunities that are dependent, in part, on the natural setting and scenic qualities of the area. Reducing the risk of severe wildfire would enhance the opportunities for a qualities within the project area.

The ROS classification within the proposed prescribed burning units includes Primitive, Semi-Primitive Non-Motorized and Semi-Primitive Motorized. Alternative B is consistent with these classifications,
although burning activities would have a short term impact to visitors during the burning operations themselves, there would be no long term negative effect on the access, settings, or recreational opportunities once the project is complete.

Effects to special features, and manageability would not change

Effects to Natural
Effects to the natural integrity would be noticeable and diminished temporarily (short term) and return to natural conditions (long term). There would be little to no evidence that the fires were initiated as a management tool versus natural ignition, therefore the proposed management actions would have minimal impact on the “untrammeled” characteristic of wilderness. This would enhance the characteristic of “naturalness”.

Effects to Undeveloped
Effects to undeveloped would not change. Since no ground disturbing activities are proposed, the project would not impact the characteristic of the area being “undeveloped.” Reintroducing fire into this fire adapted ecosystem would begin reversing the trends caused from past fire suppression and reduce the risk of large, severe wildfires.

Outstanding opportunities for solitude or a primitive and unconfined type of recreation
There would be no direct effect to the outstanding opportunities for solitude from the proposed action. The proposed action would have positive indirect impacts to the primitive and unconfined recreation opportunities that are dependent, in part, on the natural setting and scenic qualities of the area. There may be minor and short term impacts to “solitude” within the project area during hand or aerial ignitions. The proposed project would not impact opportunities for “primitive and unconfined type of recreation.”
Overall, the impacts to wilderness character within the IRA would be minor and short-term. The proposed action would not impact the suitability of the area for designation as Wilderness pursuant to the Wilderness Act of 1964. Decommissioning activities would include re-contouring all temporary road portions visible from open system roads and seeding with a grass seed mix recommended by resource specialists, with a preference for native grass species whenever feasible and appropriate for a given site. All temporary roads and constructed landings would be monitored for 3-5 years for invasive plants following completion, and invasive plants would be treated if present. These temporary roads would be outside backcountry restoration boundaries.

Cumulative Effects
There are few past, present and foreseeable activities within the project analysis area. The recreational uses would continue within the general area. Wildfire or other prescribed fire occurring within the region during the proposed prescribed burning activity could contribute to the cumulative effects to diminishing the recreation experience; these effects would be short term and temporary.

Summary of Effects
The proposed action would have short term direct impacts to recreation, roadless and wilderness resources during the prescribed fire activity and mechanical treatments. The long-term indirect effects of the proposed action include ecosystem restoration, a reduction in the risk of negative impacts from severe wildfire, long term benefits for recreational settings and opportunities.

3.8.4 Alternative 3 - Winter Logging
Alternative 3 proposed actions/activities would implement the same vegetative treatments (both cutting and broadcast burning) that provide merchantable timber, reduction in both surface and canopy fuels,
increases aspen occurrence and vigor within the project area, and facilitates development of more fire resistance tree stands as Alternative 2.

**Direct and Indirect Effects**
The direct and indirect effects to recreation would be similar to those described for Alternative B – Proposed Action. Effects to special features, and manageability would not change.

**Effects to Natural**
Effects to the natural integrity would be noticeable and diminished temporarily (short term) and return to natural conditions (long term). There would be little to no evidence that the fires were initiated as a management tool versus natural ignition, therefore the proposed management actions would have minimal impact on the “untrammeled” characteristic of wilderness. This would enhance the characteristic of “naturalness”.

**Effects to Undeveloped**
Effects to undeveloped would not change. Since no ground disturbing activities are proposed, the project would not impact the characteristic of the area being “undeveloped.” Reintroducing fire into this fire adapted ecosystem would begin reversing the trends caused from past fire suppression and reduce the risk of large, severe wildfires.

**Outstanding opportunities for solitude or a primitive and unconfined type of recreation:**
There would be no direct effect to the outstanding opportunities for solitude from the propped action. The propped action would have positive indirect impacts to the primitive and unconfined recreation opportunities that are dependent, in part, on the natural setting and scenic qualities of the area. There may be minor and short term impacts to “solitude” within the project area during hand or aerial ignitions. The proposed project would not impact opportunities for “primitive and unconfined type of recreation.” Overall, the impacts to wilderness character within the IRA would be minor and short-term. The proposed action would not impact the suitability of the area for designation as Wilderness pursuant to the Wilderness Act of 1964. Decommissioning activities would include re-contouring all temp road portions visible from open system roads and seeding with a grass seed mix recommended by resource specialists, with a preference for native grass species whenever feasible and appropriate for a given site. All temporary roads and constructed landings would be monitored according to USDA Forest Service Guide to Noxious Best Management Practices. These temporary roads would be outside backcountry restoration boundaries.

**Cumulative Effects**
There are few past, present and foreseeable activities within the project analysis area. The recreational uses would continue within the general area. Wildfire or other prescribed fire occurring within the region during the proposed prescribed burning activity could contribute to the cumulative effects to diminishing the recreation experience; these effects would be short term and temporary. The cumulative effects would be similar to those described in Alternative B–Proposed Action.

**Summary of Effects**
The long term indirect effects of the proposed action include ecosystem restoration and a reduction in the risk of negative impacts from severe wildfire. Alternative 3 would not be as effective as the proposed alternative 2 with weather and conditions contributing to adverse impacts to project access.
### Table 20. Summary of Effects of Alternatives to the Wilderness Attribute/Roadless Characteristic.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural</td>
<td>Continue degrading condition</td>
<td>Short term negative, long term benefit and improvement</td>
<td>Short term negative, long term benefit and improvement</td>
</tr>
<tr>
<td>Undeveloped</td>
<td>Long term negative</td>
<td>No Change</td>
<td>No Change</td>
</tr>
<tr>
<td>Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation</td>
<td>Diminished and changed from current condition</td>
<td>Short term negative during treatment implementation, long term improvement</td>
<td>Short term negative during treatment implementation, long term improvement</td>
</tr>
<tr>
<td>Special Features and Values</td>
<td>Long term negative</td>
<td>Maintained and long term improvement</td>
<td>Maintained and long term improvement</td>
</tr>
<tr>
<td>Manageability</td>
<td>No change</td>
<td>No change</td>
<td>No change</td>
</tr>
</tbody>
</table>

### 3.9 Visual and Scenery Quality

#### 3.9.1 Affected Environment

**Methodology**

The goal of “Providing for a pleasing visual landscape” is found on page IV-2 as Goal 6 under the Recreation heading. This is the only direction the Forest Plan provides in terms of addressing the visual resource or scenery. This analysis was conducted using ArcMap and relevant Geographic Information System (GIS) data layers from the Salmon Challis National Forest.

Visual Quality Objectives were established after the Forest Plan was implemented, and a GIS map that identifies these in relation to areas on the forest was provided. Inherently, meeting visual quality objectives serves the purpose of providing for a providing a pleasing visual landscape. Therefore, the effects analysis provided is based on answering the following questions:

- How closely the project meets the expectations of the visual quality objectives allocated throughout the project area. That is, do the proposed actions result in fire regimes that appear to be consistent with the visual quality objectives descriptions?
- Does the proposed actions strive to meet the forest goal of providing for visually appealing landscapes?

**Background**

To help resource specialists better meet stated goals and objectives for the scenery of a particular forest plan, the Forest Service developed and implemented the Visual Management System (VMS) in 1974. This long serving system is replaced by the newer (but similar) Scenery Management System (SMS); however, the Salmon – Challis National Forest is still operating under its 1987 Forest Plan so the VMS still applies.
The Visual Management System (VMS)
The Visual Management System provides measurable standards for general management prescriptions, and allows management activities or other uses to occur (or continue to occur) while safeguarding the scenic quality. There are five visual quality objectives (VQO’s) that can be used to give direction to fire management planning though only two apply to the project area (USDA, 1985)

Table 21. Visual Quality Objectives used to give Direction to Fire Management Planning.

<table>
<thead>
<tr>
<th>VQO Descriptions (as defined above)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preservation</td>
<td>Only ecological changes are permitted. Applies to the wilderness areas within the project area.</td>
</tr>
<tr>
<td>Retention</td>
<td>Management activities are not visually evident. Does not apply within the project area.</td>
</tr>
<tr>
<td>Partial Retention</td>
<td>Management activities remain visually subordinate. Does not apply within the project area.</td>
</tr>
<tr>
<td>Modification</td>
<td>Management activities are dominant, but appear natural.</td>
</tr>
<tr>
<td>Maximum Modification</td>
<td>Management activities are dominant, but appear natural when seen in the background. Does not apply within the project area.</td>
</tr>
</tbody>
</table>

Existing Condition

Access to the project area is from the Custer Motorway (FS-070) and FS-080 along Challis Creek Lakes following Challis Creek to Mosquito Flats Reservoir Campground. The project area includes Summit Rock continuing east outside of Greenwood Station. Visitors are drawn to the general area for hunting, fishing opportunities, and motorized access. The primary recreation activities occurring within the project area are big game hunting, hiking/backpacking, and motorized vehicle use on designated routes.

There is developed camping at the Mosquito Flats Reservoir Campground. The site contains nine designated camping areas and has three vault toilets and one pit toilet. There is one developed concrete boat ramp providing boat access to the reservoir. Fishing is a prominent activities for campers and recreationists. There is one Forest system trail within the project area, trail #114. Access to Challis Creek Lakes is designated jeep trail 091 traversing Challis Creek that is accessible by foot, horseback, or motorized travel.

There is one commercial outfitter operating within the project area who operates immediately adjacent to the project area. The outfitter provides a variety of services such as guided hunting and other backcountry trips. There are no outfitter camps located within the project area.
Figure 1. Typical views of the existing scenic condition of slopes along the boundary within the project area.

Figure 2. Typical middle-ground view of the existing scenic condition within the project area.
Environmental Assessment  Mosquito Flat Fuels Reduction Project

Figure 3. Typical foreground view of existing scenic condition within the project area.

Desired Condition

The goal of “Providing for a pleasing visual landscape” is found on page IV-2 as Goal 6 under the Recreation heading. The desired condition or character of a landscape is its appearance and will either be retained or created over time. The role of fire and mechanical treatments in achieving the desired scenery condition over may include:

- Creating or maintaining an open park-like foreground (an immediate condition)
- Perpetuating certain species (and immediate foreseeable and long term condition).
- Creating a mosaic of different plant species, age classes, or successional stages (a foreseeable long term condition).
- Rejuvenating plants that depend on fire for regeneration, are past their prime, or are presently nonexistent (foreseeable long term condition).

Environmental Consequences

Ecological components of a landscape such as vegetation characteristics (e.g., species, stand age, mosaic patterns, etc.), fuels composition, fire frequency, severity, pattern, and other associated disturbances (including beetle kill) give a landscape its visual characteristics and fire regimes (natural or manufactured) can alter these based on severity (Bacon, 1985). This section discloses the effects to the visual or scenery resource under each alternative.

Spatial and Temporal Context for Effects Analysis

The visual resource is affected by two different events that have different time frames. These are short and long terms effects associated with beetle kill, and short and long term effects associated with wildfires. The timeframes below also represent “re-generation timelines” or “normal or natural intervals” used in effects analysis.
Visual effects associated with beetle infested trees (McDaniel, 2008):

**Short Term:**
1 - 3 Years: Red Phase (dead trees with red needles as a result of attack and death).
10 – 20 Years: Grey Phase (dead standing trees with no needles)

**Long Term:**
20 + Years: Trees starting falling to the ground and building fuels.

Visual recovery rates associated with vegetation regeneration for a visually dominant lodgepole pine forests (Lodgepole Pine, 2007):

**Short Term**
1-30 years: Approximately 30 years are required for lodgepole pines to reach a height of 30 ft.

**Long Term**
30 + years to reach estimated mature height of 99 ft.

**Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis**

Historic grazing and past fire suppression have had a major influence on current vegetation. Condition of forested vegetation reflects effects of 80 years of fire suppression. Inventoried Roadless Areas on the National Forest will be protected from timber harvest and road construction with limited exceptions in the near term. Recreation uses of public land will continue to expand and demand for motorized uses will increase. These actions may overlap in space and time.

### 3.9.2 Alternative 1 – No Action

**Direct Effects and Indirect Effects**

This evaluation should allow an assessment of the short and long-term effects of failing to implement the project in the event the court is asked to consider requests for an injunction. With the implementation of a No Action Alternative (Alternative 1) the following actions would need to be assessed: 1) Wildfire effects on forests stands, 2) Restoration of the historic range of variability (HRV) to promote forest health and resistance to insects and disease. 3) Changes in forest structure in the project area and increased potential for uncharacteristic fire behavior.

A high severity landscape-scale wildland fire (during summer drought and extreme weather conditions) is a plausible event in the near-term as a consequence of not implementing hazardous fuels reduction activities. This is the context for which the consequences of adopting Alternative 1 would be evaluated for this project.

If or when a wildfire does occur, the existing condition of the project area (as a result of avoiding treatment) is expected to promote a fire of unnaturally high severity, proportion, or intensity. There is a high risk of destroying key ecosystems and substantially altering vegetation attributes from their natural historic range – preserving few if any species – and this can have a significant effect on the short and long term implications of scenery. That is, with vegetative regeneration timelines delayed as a result of such damage, the landscape will be seen in a context of having lower scenic integrity or visual quality over longer spans of time. Visual conditions under the no action alternative could result in landscapes that
appear in an unacceptable preservation, retention, modification or maximum modification VQO state for the short and long term. This exceeds the current VQO of preservation, retention, and modification.

**Cumulative Effects**
Visual impacts or changes due to increased fuel loading are noticeable throughout the project area. Under the no action alternative there would be no change to the current stand structure. No planned past, present, or foreseeable future projects would change this effect either. The occurrence of mechanical fuels reductions and prescribed fire practices or wildfires would increase the visual effect as opposed to beetle kill scenes, but estimating the extent is speculative. The wildfire scenes would represent those of large, high burn severity levels which do little to promote timely or effective regeneration and improves scenery.

**Summary of Effects**
Alternative 1 promotes an existing vegetative condition that is outside of its natural fire regime. As a result, the areas within the project boundary will most likely fail meeting prescribed Visual Quality Objectives in the likely event a wildfire occurs.

### 3.9.3 Alternative 2 – Proposed Action

**Direct Effects and Indirect Effects**
Under Alternative 2, treated sections within the project area boundary would be restored closer to or within their natural historic fire regimes – and serve both visually and functionally as a fire adapted ecosystem. The appearance of the landscape under this alternative will be one that reflects a forest that has been subjected to fire events of mixed severity. Evidence of crown fires may be apparent but such occurrences are expected to infrequent since treatment will occur when weather conditions keep fire severity in check and closer to the ground. Scenes associated with bug killed lodgepole pines and other large dead fuels will be reduced, giving the forest a more positive park like appearance. Producing a mosaic of thinned out appearing holes within the landscape, also contributes to creating this a more open, thinned, and cleaned up effect, and brings the landscape closer to its natural historic regime. “Green up” or vegetation regeneration that will occur within a natural timeframe and will serve to only enhances scenic quality.

When treated as prescribed, the area within the project boundary will have a higher fire effects absorption capability. The risk of destroying key ecosystems and altering vegetation attributes from their natural historic range is much lower, more species are preserved, and this can have significant effect on the short and long term implications to scenery. That is, vegetative regeneration timelines continue at normal intervals and the landscape will be seen in a context of having higher scenic integrity or visual quality. In the long term, visual conditions under this alternative will likely result in landscapes that appear to meet the Retention, Partial Retention, and Modification (non-Wilderness) visual quality objectives, and comply with Forest Plan standards and guidelines and depict the desired condition.

**Cumulative Effects**
The project or activity types that could have cumulative effects under this proposed action involve other wildfires or mechanical treatments in nearby or adjacent areas. Wildfires starting in untreated areas have the potential to add more negative scenery effects to what already exists along the project area boundary or the project area. Prescribed fire treatments can help restore areas to more natural regimes and improve the overall quality of scenery and help protect scenic quality from natural fire events in the future. No other project types from the past that are occurring now, or proposed in the future are expected to have significant effects on the visual resource aside from an activity being seen.
Summary of Effects
Alternative 2 promotes a desired vegetative condition that is closer to or within its natural fire regime. As a result, the areas within the project boundary will most likely meet or exceed prescribed Visual Quality Objectives in the likely event a wildfire occurs.

3.9.4 Alternatives 3 - Winter Logging

Although the same acres would be considered in Alternative 2 and 3, ground visits and resource concerns will most likely eliminate some of the area not logistically capable of supporting winter ground based logging operations due to project area features such as percent slope, frozen ground requirements, spring breakup, and other site/season specific factors. Winter logging implementation activities would continue during the frozen ground layer period and cease on March 15th, or when the Great Grey Owls begin their mating season/rituals. As in Alternative 2 winter logging landing piles would be burned in the fall the following year after acceptance of timber sale closure by the Forest Service. Impacted soils from the heat of burning at the landings would then be scarified, fertilized, and seed with the same native seed mixes at the roads, the same as Alternative 2. Alternative 3 proposes the same invasive plants monitoring period (3-5 years) for temporary roads, skid trails and constructed landings as Alternative 2.

Direct and Indirect Effects
The direct and indirect effects to recreation would be similar to those described for Alternative 2 – Proposed Action.

Cumulative Effects
The cumulative effects would be similar to those described in Alternative 2 – Proposed Action.

Summary of Effects
The long term indirect effects of the proposed action include ecosystem restoration and a reduction in the risk of negative impacts from severe wildfire. Alternative 3 would not be as effective as the proposed alternative with weather and conditions contributing to adverse impacts to access.

3.10 Silviculture – Forested Vegetation

3.10.1 Affected Environment

With fire suppression activities and livestock grazing beginning in the early 1900’s, the Forests of the Intermountain Region began to develop a complex character with a wider variety of tree species with more shrub and down-woody debris. Stand replacing fires are less frequent in lodgepole pine forests, which naturally depend on fire to help regenerate the species. High elevation forests are losing their diverse mosaic character, creating stands with high fuel loads and insect and disease susceptible trees. These stand conditions, historically seldom occurred naturally and today are producing a situation where high intensity catastrophic fires will occur (Hamilton R. C., 1993).

The forested vegetation in the project area is composed of Interior Douglas-fir (Pseudotsuga menziesii), lodgepole pine (Pinus contorta), subalpine fir (Abies lasiocarpa), whitebark pine (Pinus albicaulis), Engelmann spruce (Picea engelmannii), and quaking aspen (Populus tremuloides). For purpose of this report Interior Douglas-fir and quaking aspen will be referred to as Douglas-fir and aspen. This is typical conifer stand composition for this portion of the Rocky Mountains.

Subalpine fir and Engelmann spruce populations are increasing throughout the project area, with multi-layering and heavy stocking levels. Historically subalpine fir and Engelmann spruce were minor
components in mixed conifer stands. With lack of natural disturbance such as fire, or management activities subalpine fir will continue to increase in population and become a heavier stand component. Engelmann spruce will be restricted to wetter soil types.

Pure whitebark pine stands exist and are a major component at upper elevation ranges in the project area. Small individual populations are found throughout the Action Area in mixed conifer stands. Fire often provided the competitive advantage to whitebark pine trees by removing less fire resistant subalpine fir from a given area. But with fire suppression and an increase in conifer encroachment, whitebark pine tree numbers have steadily declined.

Aspen stands are present in wetter soil conditions, but historically occupied a larger area then today. Aspen succeeding to conifers are responding to natural forces. Aspen is considered a disturbance species perpetuated on site by fire, disease, or other such occurrences. Some of these forces (primarily fire) have been altered by human intervention, which has given shade-tolerant conifers a marked advantage (Bartos 20011).

Historically Douglas-fir stands were open grown with low stocking densities and single story large (18 inches diameter at breast height (d.b.h) or larger) diameter tree stands. Some multi-layered old forest stands existed, but densely stocked multi-layered younger forests were not common (USDA 1997).

Currently, the area is experiencing heavy infestations of western spruce budworm (Choristoneura occidentalis), causing Douglas-fir trees to defoliate from the crown down and characterized by dead or brown tops. The Douglas-fir beetle activity has killed approximately 800 Douglas-fir trees in the Mosquito Flats Fuels Reduction Project area over the last ten years (Aerial Detection Records 2002-2012).

The mountain pine beetle (Dendroctonus ponderosae) epidemic has caused high mortality to lodgepole pine trees resulting in 267,894 deaths (Lazarus, 2012) and left remaining lodgepole pine trees stressed and susceptible to disease. Fuelwood cutting within the 300’ corridor of established road systems and firewood cutting units have significantly reduced the amount of dead standing lodgepole pine and opened the canopy allowing shade intolerant species (lodgepole pine) to successfully regenerate. Consequently in mixed conifer stands the dead lodgepole overstory has opened the canopy and released the Douglas-fir understory, creating thick highly dense thickets.

Table 22. Estimated vegetative conditions within the seven stand structures for warm/dry and cool/dry Douglas-fir habitat types for the Challis Creek Watershed. (USDA 1997)

<table>
<thead>
<tr>
<th>Stand Structural Stages</th>
<th>HRV ac.</th>
<th>Exist ac.</th>
<th>Within HRV ac.</th>
<th>Outside HRV ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stand Initiation</td>
<td>1,687</td>
<td>1,687 – 7%</td>
<td>1,687</td>
<td>0</td>
</tr>
<tr>
<td>Stem Exclusion: open Canopy</td>
<td>8,673</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Stem Exclusion: Closed Canopy</td>
<td>8,673</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Understory Reinitiating</td>
<td>0</td>
<td>8,914 – 37%</td>
<td>0</td>
<td>8,914</td>
</tr>
<tr>
<td>Young Forest Multi-Stratum</td>
<td>0</td>
<td>1,205 – 5%</td>
<td>0</td>
<td>1,205</td>
</tr>
<tr>
<td>Old Forest Multi-Stratum</td>
<td>2,650</td>
<td>10,842 – 45%</td>
<td>2,650</td>
<td>8,192</td>
</tr>
<tr>
<td>Old Forest Single Stratum</td>
<td>2,650</td>
<td>1,446 – 6%</td>
<td>1,446</td>
<td>0</td>
</tr>
<tr>
<td>Total Acres</td>
<td>5,783</td>
<td>18,311</td>
<td>24%</td>
<td>76%</td>
</tr>
<tr>
<td>Percent of Douglas-fir H.T.</td>
<td></td>
<td>24%</td>
<td>76%</td>
<td></td>
</tr>
</tbody>
</table>
Overall stand structure is predominantly multiple structural layers (Table 22) with high tree densities. This multi-layered conifer structure is replacing the Historical Range of Variation (HRV) that used to consist of open canopy like conditions. This has caused an increase in tree competition, additional fuel accumulation with high fuel loading, and a decrease in understory plant diversity and biomass.

### 3.10.2 Alternative 1 - No Action

**Thinning Cut**

Implementing Alternative 1 (no action) in the proposed thinning treatment areas have many direct consequences including high risk of insect and disease susceptibility, large fuel accumulation, and a high probability of catastrophic fire.

Douglas-fir is a wide-ranging species with very broad ecological amplitude. In the dry parts of its range, it grows in an uneven-aged fire-dominated subclimax. Interior Douglas-fir tends to regenerate naturally in very dense thickets that establish in canopy gaps after disturbance. Thickets at very high densities tend to stagnate. Tree and stand vigor is reduced, growth declines, and risk of insect or disease attack increases. With the lack of disturbance in the proposed thinning units, high tree densities will persist until sites can no longer support further tree establishment. Taking no action will result in continued increase in conifer densities and lower tree vigor as numerous individual trees compete for limited resources. With high densities and low stand health, thinning units may be highly susceptibility to catastrophic fire and/or insect and disease outbreak.

The Douglas-fir beetle outbreak in Mosquito Flat is now in decline based on (1) the current abundant defensive pitch streaming of Douglas-fir in response to 2012 Douglas-fir beetle attacks; (2) unsuccessful 2011 brood development; (3) Douglas-fir beetle traps in Mosquito Flats caught more Thanasimus predator beetles than Douglas-fir beetles, indicating natural enemies are reducing populations (Lazarus, 2012). Douglas-fir beetle populations may increase in the event of extensive windthrow, after large fires, or after consecutive years of drought and defoliations. The project area has been in consecutive years of drought and defoliation by the western spruce budworm. The western spruce budworm outbreak is currently at a moderate level. The Moderate level defined as 1/3 to 2/3 of tree crown being defoliated (Lazarus, 2012).

The Lodgepole fire of 2013 consumed 2200 acres of the project area and 22,754 acres of the management area making Douglas-fir more susceptible to Douglas-fir beetle attacks. Stand basal area is the most significant indicator of mortality during a Douglas-fir beetle outbreak. Stands highly susceptible to Douglas-fir beetle attacks have a stand basal area >250 feet, a larger plurality of Douglas-fir (>50 percent), are >120 years old, and have an average DBH >14 inches (Lazarus, 2012). Availability of large trees is important in the development of an outbreak. No Action will result in larger diameter dominant and co-dominate Douglas-fir trees. High populations of Douglas-fir beetle can result in large areas of infested trees but will typically subside after a few years (Lazarus, 2012).

By implementing alternative 1 (no action) there are indirect effects. Douglas-fir levels of defoliation are predicted to rise from moderate to heavy in larger trees over the next several years; heavy defoliation being over 66% of crown (Lazarus, 2012). Mortality will be common in Douglas-fir regeneration classes that are less than 5 inches DBH as western spruce budworm larvae migrate downward off larger Douglas-fir due to hunger or physical disturbance. The Mountain pine beetle epidemic will cease and as lodgepole pine tree mortality continues, there should be fewer concerns about snag recruitment and retention in the project area for the next decade (Lazarus, 2012). The accumulation of insect and disease infested trees will increase hazardous fuel loading making the project area susceptible to stand replacing fires.
Aspen Restoration

Using an aspen loss risk rating system (Campbell & Bartos, 2001), aspen stands in the project area are at a high risk of aspen stand loss. Aspen is considered a shade-intolerant species and conifers will continue to encroach and out compete aspen, resulting in loss of aspen clones and regeneration. By implanting Alternative 1 (no action) conifers growing in the understory of aspen stands will eventually overtop the aspen canopy in the absence of fire or some other disturbance. In time, aspen will disappear from that location on the landscape (Shirley & Erickson, 2001).

The indirect effect of alternative 1 (no action) is continued loss of aspen diversity, regeneration and populations across the landscape as conifers continue to encroach and increase in population. Loss of stands will affect aspen dependent wildlife species and continue to diverge from HRV.

Overstory Removal

Taking no action in the OSR units will continue the two layer stand structure, where the understory has high tree densities and will eventually become stagnant due to limited resource availability. Stagnant stands of timber have high mortality, grow slowly, and have low production. Overstory will continue to suppress seedling and saplings until a major natural disturbance removes the lodgepole overstory.

Broadcast Burn Units

White bark pine is an endangered candidate species listed under the U.S. Department of the Interior, Fish and Wildlife Service Endangered Species Program. Whitebark pine is increasingly becoming displaced by later-successional species due to lack of disturbance (Keane & Arno, 2001). No action alternative will result in a decrease of whitebark pine populations of all size classes throughout the project area as conifers continue to encroach and outcompete for nutrients and sunlight.

An abundance of fuel loading from lack of fire, along with insect and disease weakened trees, high stand densities, continued fuel continuity and low tree vigor make the project area highly susceptible to catastrophic fire.

Indirect effect of no action will be a continued decrease in populations of whitebark pine trees across the landscape. In time, small populations of limited diversity will remain until some form of natural disturbance is displayed across the landscape, at which time populations may be too low to successfully regenerate, and genetic diversity will be limited.

Fuel loading will continue to increase from individual or group tree mortality. Insect and disease susceptibility will continue making those individuals or stands highly susceptible to fire. The project area will have a low fire resiliency due to fuel accumulation, high tree densities, and low stand health.

Summary of Effects

There are no direct or indirect effects implementing Alternative 1, thus no cumulative effects. If no action is taken in the proposed project area tree densities will continue to increase to the point of stagnation. High tree densities and thick canopy structure will lower tree vigor and leave trees susceptible to insect and disease. Large diameter Douglas-fir will be susceptible to Douglas-fir beetle attacks. Tree mortality will increase fuel loading, leaving more fuelwood for wood cutters where readily available and also increasing availability of fuel for wildfires. No action could affect recreational areas, and visual quality may decrease. Recreation areas including, camping areas and trails may close due to snag hazards.
Historically reoccurrence of fire limited and controlled the amount of Douglas-fir on sites. With fire suppression efforts, stands will continue to diverge from HRV until a stand replacing fire or other major disturbance returns the stand back to early seral stages.

### 3.10.3 Alternative 2- Proposed Action

A tentative summary of the method of treatment for the Thinning Cut, Aspen Restoration Cut and Overstory Removal Cut activities are listed in Table 23. Treatments in the Mosquito Flat Fuel Reduction Project. Current stand conditions will be used to determine whether or not the stand conditions goals, identified in Table 23, have been met. Applicable treatment method(s) will then be implemented to meet desired goals. A total of 742 acres exist that could potentially be commercially thinned, such as through a timber harvest, based on stand conditions and site suitability.

**Thinning cut**

Implementing Alternative 2, large live trees and legacy trees would be retained in all areas affected by cutting activities. The proposed actions will reduce stands basal area and lower large diameter trees susceptibility to Douglas-fir beetle attacks by (1) increasing individual tree vigor because of reduced competition for light, moisture and minerals; (2) increase ability of trees to pitchout beetle attacks because of enhanced tree vigor; (3) decrease success of bark beetle aggregant pheromone plumes in open stands of trees; and (4) change site microclimate that is suitable for attracting colonizing beetles (Lazarus, 2012).

In fully stocked, even aged and two-aged stands large fire resistant Douglas-fir will be favored and cuttings will be loped and scattered away from large Douglas-fir trees. The retention of large trees at low to moderate density is compatible with creating and maintaining fire-resilient stands. With larger tree spacing, wider crown distances and a reduction in fuel accumulation, fire intensity will likely remain moderate to low and less likely to produce stand replacing fires. With lower intensity fires, strategic suppression efforts can be readily implemented.

Indirect effects of implementing Alternative 2 increases individual tree vigor throughout cutting area by reducing tree densities. Reducing variations in canopy height classes will lower the stands susceptibility to the western spruce budworm and return the stands to one which resembles an HRV. Mechanical treatments may increase Douglas-fir beetle activity by damaging mature Douglas-fir during processing, especially during peak Douglas-fir beetle flight from May through August. Harvesting treatments can release volatile Douglas-fir semiochemicals that can lure beetles into units (Lazarus, 2012).

**Aspen Restoration**

Proposed prescriptions include restoration cuts on aspen stands, creating a multi-aged regeneration of predominantly aspen. Conifers will be cut out of mixed stands, converting them to an aspen cover type. Prescribed fire with moderate to high severity where aspen is present will create favorable regeneration conditions. After the proposed action of Alternative B the aspen stand loss risk will have a standard risk rating of low.

Once aspen restoration units have been treated the lack of canopy cover from conifers will allow more sunlight to reach the forests floor, producing more forage. In complex vegetation, such as the aspen type, many species are eaten by grazing animals. When implementing fire, it may consume both the conifer and aspen overstory; the aspen root system will often survive. Upon release from the apical dominance of the overstory trees, the root system responds by sending up thousands of suckers to reoccupy the site. The
rapid initial growth rate of aspen, along with a fully established root system, allows it to outcompete other colonizing tree species for light, moisture, and nutrients. In this manner, a particular stand of aspen can maintain its position upon the landscape (Shirley & Erickson, 2001).

**Overstory Removal Cut**

Direct effects of Alternative 2 in the overstory removal (OSR) units will remove live and dead trees constituting the upper canopy layer. Directly removing the upper canopy will allow advanced understory regeneration to be released and convert the stands multistory structure class to a single story. Returning the stand to a single story structure will resemble the HRV and enhance stands fire resiliency.

The indirect effects of implementing the proposed action will increase overall stand health. The thinning prescription will lower basal area, release the existing suppressed understory trees, and promote a younger structure class. Once the understory is released and stand vigor increases, trees will be more defensible against insects, disease, and wildfires.

**Table 23. Treatments in the Mosquito Flat Fuel Reduction Project.**

<table>
<thead>
<tr>
<th>Cover</th>
<th>Treatment</th>
<th>Method</th>
<th>Acres</th>
<th>Prior Harvest</th>
<th>Commercial Harvest or Non-commercial Thin</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
<td>Thin</td>
<td>Mechanical</td>
<td>324</td>
<td>Yes</td>
<td>Commercial</td>
<td>Re-entry into prior treated areas</td>
</tr>
<tr>
<td>DF</td>
<td>Thin</td>
<td>Mechanical</td>
<td>370</td>
<td>No</td>
<td>Commercial</td>
<td>Initial Entry</td>
</tr>
<tr>
<td>DF/LP</td>
<td>Thin</td>
<td>Mechanical</td>
<td>48</td>
<td>Yes</td>
<td>Commercial and Non-Commercial</td>
<td>Re-entry into prior treated areas</td>
</tr>
<tr>
<td>DF</td>
<td>Thin</td>
<td>Hand</td>
<td>494</td>
<td>No</td>
<td>Non-Commercial</td>
<td>Initial Entry</td>
</tr>
<tr>
<td>DF/AS</td>
<td>Thin</td>
<td>Hand</td>
<td>224</td>
<td>Yes &amp; No</td>
<td>Non-Commercial</td>
<td>Aspen Restorations</td>
</tr>
<tr>
<td>DF/AS</td>
<td>Burn</td>
<td>Broadcast Burn</td>
<td>7,565</td>
<td>Yes &amp; No</td>
<td>N/A</td>
<td>Prescribed burning may or may not be implemented throughout entire project area, based on stand conditions</td>
</tr>
</tbody>
</table>

**Broadcast Burn Units**

Prescribed broadcast burns will directly consume ground fuel and reduce the access accumulation. Burns will be patchy and mosaic like with a range of severities from low (<25% canopy mortality) to high (>75% mortality). Depending on burn severity, prescribed burns will directly remove a variety of tree species of all size classes across the landscape. When reintroducing fire to the landscape mature whitebark pine trees will usually survive low and sometimes moderate-severity surface fires due to bark thickness. Bark-thickness in whitebark pine is moderate: thinner than ponderosa pine but thicker than lodgepole pine. Pole and smaller-sized whitebark pines usually do not survive surface fires but a patchy
fire resulting from fuel-limited whitebark pine habitats reduces whitebark pine mortality (Keane & Arno, 2001).

Indirect effect of prescribed burning will encourage and create conditions suitable for whitebark pine regeneration. Regeneration of whitebark pine is aided by the Clarks nut cracker (Nucifraga columbiana). Clark's nutcrackers prefer open sites with mineral soil for caching, and readily cache seed on large openings created by stand-replacement fire and in smaller openings created by mixed-severity fire. Cone-bearing trees close to burns are usually the parent trees, but some Clark's nutcrackers collect and transport seed from distant trees (Keane & Arno, 2001).

Prescribe fire will stimulate growth in the aspen units by killing less fire resistant fir, preparing seed beds and stimulating aspen shoots. In the foreseeable future more prescribed burning will likely be needed. Conifer reproduction generally enters seral aspen communities about 15 to 20 years after a fire. Forage production peaks about this time and then rapidly declines in both quantity and quality when conifer basal area approached 50 square feet per acre (Mueggler, In: DeByle, & Winokur, 1985).

Summary of Effects

Implementing alternative 2 has multiple thinning prescriptions that will mitigate for the cumulative effects by reducing stands susceptibility to insects and disease and catastrophic fire. Prescriptions will reduce stand density to appropriate levels and reduce canopy layering, retaining the most vigorous trees and create greater crown spacing. In the reasonable foreseeable future fire suppression will continue along with cattle grazing activities. After all proposed activities have been implemented and densities have been reduced, natural processes will continue and regeneration will persist, gradually increasing stand densities overtime.

3.10.4 Alternative 3- Winter Logging

Thinning Cut
Alternative 3 involves the same proposed thinning treatments as Alternative B with similar effects as listed in Alternative 2. Variation in effects occurs because Douglas-fir beetle are in their dormant (larvae) stage and inactive during the winter months.

Implementing Alternative 3 will also reduce stand densities and increase tree vigor during the growing period throughout the project area. Mechanical treatments implemented during winter logging operations do not increase Douglas-fir beetle activity by damaging mature Douglas-fir during processing in the winter months; but increased activity may occur when the Douglas-fir beetle becomes active in the spring and during peak Douglas-fir beetle flight from May through August. Winter harvesting treatments can release volatile Douglas-fir semiochemicals but the release will not result in beetles being lured into the units as the Douglas-fir beetle are in their dormant stage during winter months.

Direct and indirect effects of Alternative 3 is the same as the direct and indirect effects of Alternative 2 as the same thinning activity would occur resulting in the same, or very similar, effects.

Aspen Restoration
In alternative 3 the same aspen stand restoration cuts will be implemented, creating the same multi-aged regeneration of predominantly aspen as in alternative 2. Conifers will be cut out of mixed stands, converting them to an aspen cover type as in alternative 2. Both alternative 2 and 3 will incorporate understory broadcast burning when time of season, fuels and burn prescriptions are favorable. Therefore,
alternative 3 would result in the same effects on aspen as Alternative B when implementing prescribed fire in the aspen stands.

**Overstory Removal**

Alternative 3 has the same implementation actions in the OSR stands as alternative 2, removing upper canopy and releasing the understory. Mechanical treatments will be conducted during the winter months and thus soil disturbance will be minimal, as equipment is able to travel over frozen soil. Mechanized equipment may cause additional incidental mortality to seedling and sapling understory vegetation depending on snow depth. Since the proposed actions are the same as Alternative 2 the indirect effects results are the same.

**Broadcast Burn Units**

Alternative 2 and 3 treatment areas and proposed cutting activities are the same. The same delegation for retention of whitebark pine for all treatment prescription apply to both alternatives and will result in approximately the same increase in whitebark populations when canopy is removed and conifer densities are reduced.

Alternative 2 and 3 treatment effects will be the same due to similarities in proposed cutting treatments followed by prescribed fire implementation.

**Summary of Effects**

In alternative 3 the same implementation of multiple prescriptions will take place as alternative 2, with the same direct and indirect effects for past and present resulting in mitigation of cumulative effects that will result in reduction of susceptibility of trees to insects and disease. As in alternative 2 future wildland fire suppression efforts will continue in the project area, along with cattle/horse grazing activities. Following alternative 2 and 3 project implementation stand densities will be reduced and regeneration will persist, gradually increasing project area stand densities.

3.11 Wildlife

**3.11.1 Affected Wildlife Species**

The action area for wildlife is the project area boundary, inclusive of all proposed treatment units; however, the analysis may consider a larger area for direct, indirect, and cumulative effects, depending on the species and if appropriate.

**Methodology**

National Forest Management Act (NFMA) regulations, adopted in 1982, require that habitat be managed to support viable populations of native and desired non-native vertebrates within the planning area (36 CFR 219.19). USDA regulation 9500-004, adopted in 1983, re-enforces the NFMA viability regulation by requiring that habitats on national forests be managed to support viable populations of native and desired non-native plants, fish, and wildlife. For this project a four-step process was used in this analysis to assess changes in species or their habitat:

**Step 1: Pre-field Assessment**

The analysis process related to wildlife species started prior to identification of proposed activities. Unique habitats such as critical habitat, or uncommon habitats, were identified. Once the proposed actions
were identified, information was collected and reviewed to identify species’ present conditions or affected environment.

Step 2: Field Assessment
The wildlife analysis was done using a multi-scale assessment that included the following straightforward strategies; 1) a coarse filter approach (described below) which is used to identify wildlife communities across a wide area; 2) the second strategy is to assess habitat and effects to those species considered most at risk and/or those species with potential viability concerns.

Step 3: Determination of changes in habitat
Using information from the steps above, anticipated changes in habitat and the associated communities were predicted under the activities considered and associated effects to wildlife and wildlife habitat evaluated.

Step 4: Proposed Action Effects Assessment
Site-specific data was used to assess specific project level changes in habitat and ensure that unique vegetative and physical habitat conditions were maintained and/or protected, as needed, and if available.

In 2014 Idaho Department of Fish and Game released a Management Plan for the Conservation of Wolverines (IDFG, Management plan for the conservation of wolverines in Idaho., 2014) and they developed Priority Conservation Areas (PCAs) based on potential wolverine use and threats, with ranking of low scores to high, categorized Tier III to Tier I respectively.

The “environmental baseline” as defined under the Endangered Species Act (ESA) includes past and present impacts of all federal, state or private actions and other human activities in the action area, and anticipated effects of all proposed federal projects in the action area that have undergone consultation, and state or private actions that are contemporaneous with the consultation. The appropriate methodology and level of analysis needed to determine effects are influenced by a number of variables including the presence of species or habitat, the scope and nature of activities associated with the proposed actions and the potential risks that could ultimately result in adverse effects. Project level analysis was used to identify habitat features that may need to be protected or enhanced and is used to identify site-specific mitigation measures for project design criteria.

This section address the effects of the no action and proposed action on federally listed endangered, threatened, proposed, and candidate terrestrial wildlife species, US Forest Service Region 4 Regional Forester’s Sensitive species, and Challis NF management indicator species and other species of concern as indicated by the Challis NF LRMP and project development. This section does not address disclosure of effects to the following wildlife species and their habitats as populations of the game species listed are managed by the Idaho Department of Fish and Game and no species were identified as issues during the scoping process: large ungulates such as elk, mule deer, and moose; large predators such as mountain lion, black bear, and coyote. The project area also provides habitat for a variety of smaller mammals, including several species of hares, mice, and voles. Blue grouse and spruce grouse utilize suitable habitat within the project area.

The interdisciplinary team (IDT) developed a list of issues to address during the initial phase of project development. The following wildlife-related issues will be considered. Table 24 contains the measures or indicators that will be used to assess the effects on wildlife and habitats from the no action and proposed action alternatives.
### Table 24. Wildlife Related Issues Developed for the MFFR Project.

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Issue</th>
<th>Issue role in project analysis</th>
<th>Indicates possible significance of effects</th>
<th>Indicates consistency with applicable laws, regulations/policy</th>
<th>Indicates opportunities to reduce adverse effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildlife</td>
<td>Adversely affect an ESA-listed Threatened or Endangered species, or its habitat</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Contribute toward a trend of ESA-listing for a Region 4 Sensitive wildlife species</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Adversely Impact Migratory Birds</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Adversely affect a Management Indicator Species or its habitat</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Reduce the number of acres of old growth habitat for dependent wildlife species</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Table prepared by (Hill, 2014)

Interagency cooperation between the Forest Service and the United States Fish Wildlife Service (USFWS), regarding proposed, threatened, or endangered species, is described in Section 7 of the Endangered Species Act. Definitions relating to "consultation" and "conference" are given in FSM Supplement 2600-90-6. The USFWS, Idaho Field Office, publishes a general reference use list of Threatened, Endangered, Candidate, and Proposed Species by county on their website (USFWS, Endangered and Threatened Wildlife and Plants, 2014). The USFWS species Threatened, Endangered, or Candidate list for Custer County (revised on August 14, 2014), SCNF, and project area are:

- Grey Wolf – *Canis lupus*, Status-Recovery, recovery efforts in progress
- Canada lynx – *Lynx Canadensis*, Status-Threatened, recovery efforts in progress
- Yellow-billed cuckoo – *Coccyzus americanus*, Status-Threatened listing status
- Greater sage-grouse- *Centrocercus urophasianus*, Status-Candidate

The USFWS Sensitive status species for Custer County, SCNF, and project area are:

- North American Wolverine - *Gulo luscus*
- Townsend’s Western Big-eared Bat - *Corynorhinus townsendii*
- Boreal Owl - *Aegolius funereus*
- Flammulated Owl - *Psiloscops flammeolus*
- Three-toed Woodpecker - *Picoides dorsalis*
- Great Grey Owl - *Strix nebulosa*
- Northern Goshawk - *Accipiter gentilis*
- Bighorn Sheep - *Ovis canadensis*
- Columbia Spotted Frog - *Rana luteiventris*
- Pileated Woodpecker - *Dryocopus pileatus*
- Migratory Bird(s) – *Varies by specific bird*
3.11.2 Alternative 1- No Action

General, Direct, and Indirect Effects for Threatened and Sensitive Species

A “No Action” Alternative was analyzed for this project. Although an alternative with no activities associated does not, by definition, have any direct, indirect, or cumulative effects on the quality of the environment, an assessment will be made of the consequences of not implementing the action alternative. The assessment of the no action alternative complements the discussion of the existing conditions within the project area; however, the existing condition and expected biological changes provide insight to the long term habitat under this alternative.

Existing management would continue, as would biological processes, and these may influence threatened and sensitive species habitat suitability, and therefore specie use of the project area. Vegetative conditions will change over time. Currently, beetles and diseases are at moderate and above levels as a result of stand density and age, and drought. Under the no action alternative, we may expect an increase in insect-related defoliation. The existing very dense stands have reduced vigor, which further makes them more susceptible to disease and insects. Aspen and whitebark pine stands and individual trees will continue to be encroached by other conifers, and eventually these species may become much reduced or absent on the landscape.

Changes in forest structure in the project area have significantly increased the potential for uncharacteristic fire behavior. A landscape-scale wildland fire during summer drought and extreme weather conditions is a plausible event in the near-term as a consequence of not implementing hazardous fuels reduction activities in the project area identified for treatment. This is the context for which the consequence of adopting Alternative 1 was evaluated for this project.

Summary of Effects

Alternative 1, no action alternative would not affect the threatened and sensitive species based on the assessment of no activities would occur, and thus there cannot be any direct, indirect, or cumulative effects.

3.11.3 Alternatives 2 and 3 - Proposed Action and Winter Logging

General Direct and Indirect to Threatened, Candidate, and Recovery Species

For the three threatened, candidate, or one recovery species there is very minimal recent and verified observation of presence of the species in, or adjacent to, the project area. There are numerous unverified observations on, or adjacent to, the project area by people with reported experience in identifying these species.

For this project the Canada Lynx (Threatened) and the Gray Wolf (Recovery) were considered in detail for this project/EA. The Salmon-Challis NF and project area are considered unoccupied, secondary lynx habitat and Canada Lynx are not believed to occupy the project area. The Gray Wolf uses a variety of habitats and is known to occur on the Salmon-Challis NF and the project area.

The Yellow-billed cuckoo (T-Listing) and Greater Sage grouse (Candidate) were not considered in detail for this project/EA. The USFWS species list does not list the Yellow-billed cuckoo as present in or near
the project area and there is no habitat for Greater sage grouse in or near the project area. In addition, there were no observations of either species in the project area.

Table 25 displays the Canada Lynx and Gray Wolf general direct and indirect effects, their project specific effected area, and a summary of the potential general direct and indirect effects for the proposed action alternatives (2, 3).

Table 25. USFWS Specie Status with Potential Direct/Indirect Effects with Affected Area.

<table>
<thead>
<tr>
<th>Specie</th>
<th>USFWS Status</th>
<th>Potential Direct and Indirect effects</th>
<th>Affected Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada Lynx</td>
<td>Threatened, Recovery efforts in progress</td>
<td>Should a lynx enter project area during project implementation, the primary potential effect would be disturbance associated with project activities.</td>
<td>The project area occurs almost exclusively in the Head of Yankee Fork lynx analysis unit (LAU), approximately 27,690 acres in size.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mechanical thinning activities (reduction in canopy cover) would affect about 16 acres of lynx habitat in the lower elevation, the less suitable habitat area for the project area.</td>
<td>Adjacent LAU’s include Squaw/Mill on the south, Trapper and Camas on the north.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The greatest potential effect on lynx habitat is from prescribed fire treatments on approximately 2,890 acres of more suitable habitat, in general under both action alternatives.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>a) A minor reduction in canopy cover in suitable foraging habitat.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) A minor reduction in snowshoe hare foraging habitat, however, foraging habitat in the form of hardwood shrubs is likely to vigorously resprout following burn treatments and be more abundant within five years.</td>
<td></td>
</tr>
<tr>
<td>SUMMARY OF EFFECTS</td>
<td>Far less than one percent of the Forest lynx habitat would be treated by prescribed fire, the primary source of effects, and given the mosaic pattern of prescribed fire even less would be consumed and changed to a stand initiation structure. The low likelihood of occupation, lynx mobility, and negligible effects are expected to make project disturbance effects inconsequential.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gray Wolf</td>
<td>Recovery, Recovery efforts in progress</td>
<td>Vegetation changes resulting from the proposed actions/activities/treatments would not cause the affected area to become unsuitable habitat.</td>
<td>Gray wolves use a variety of habitats. Because any habitat types are suitable so long as primary prey is present, the whole project area may be considered suitable habitat and affected area.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wolves are unlikely to be disturbed because they are unlikely to be active or near project activities while machinery is operating or people are in the field.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>There are no known wolf rendezvous sites that would be affected by the action alternatives.</td>
<td></td>
</tr>
</tbody>
</table>
The project area is on the edge of the only known pack’s home range; therefore most of the pack’s activity is not in the project and affected area.

It is reasonable to believe that wolf prey habitat will be affected by the proposed activities.

a) Deer and elk habitat will be altered in treatment units.
b) Reduction in the dense conifer stands will result in increase in suitable prey forage habitat and preferred browse species.
c) Short term decrease in cover in lower elevation Douglas-fir stands as a result of thinning and fuel reduction treatments.
d) Short term increase in forage cover in treated stands due to increased light and precipitation available to understory shrubs.
e) Opening of the canopy will allow tree limbs to fill in the holes in the canopy, and along the edges of thinning units, thereby increasing hiding cover over time.
f) Increased habitat value for deer and elk, and thus for wolves, in the long term.
g) The decreased threat of stand replacement wildfire or broad insect infestation would benefit wolf prey populations, and thus benefits wolves.

**SUMMARY OF EFFECTS**

The propose action alternatives may affect individuals, but it not likely to result in a trend toward federal listing or loss of viability for the gray wolf in the planning area. Wolves are wide ranging and move through forested and unforested country frequently. There would be a decreased threat of immediate habitat loss for wolf prey under the action alternatives because fire and insect risk would be reduced. There would be no increase in road access, so security would remain the same. The larger part of the local pack’s primary range is north of the project area.

**Cumulative Effects to Threatened, Candidate, and Recovery Species**

*Cumulative effects* of past, present and future activities that could affect wildlife components include two known federal, state, tribal, and/or private ongoing or considered actions in wolf habitat in the project area, cattle grazing and firewood cutting. The Forest manages the Challis Creek Grazing Allotment in the project area and firewood harvesting is limited by large inaccessible areas and steep terrain in the project area. The following are potential cumulative effects from grazing and firewood cutting:

- Defer livestock grazing on range and wildlife habitat improvement project areas for a sufficient period of time, following treatment, to allow for proper vegetation response
- Where deferred grazing and fencing may occur, the removal of livestock grazing would provide forage habitat area for wolf prey.
- Firewood cutting is unlikely to affect wolves as they are adept to avoiding people and noise associated with firewood cutting activities.
Summary of Effects to Threatened, Candidate, and Recovery Species

As the direct and indirect effects to wolves are primarily beneficial because habitat for their primary prey would improve and because other activities would not substantially affect wolves, there would be no cumulative effects from the action alternatives.

General Direct and Indirect to Sensitive Species

There is eleven species categorized as sensitive for the Salmon-Challis NF. There is a wide range of habitat needs and documented presence/absence for these species on the Forest/project area. The following is a brief summary by species.

Bighorn Sheep

Bighorn sheep are large ungulates found from southwestern Canada to northern Mexico (Beechum et al., 2007). Bighorn habitat is typically steep mountains with rock outcrops, canyons and cliffs (Beecham et al. 2007). Forage is typically grass-dominated with some shrub cover and sparse tree cover. Preferred habitat contains foraging, escape cover, escape terrain, and lambing habitat.

There is suitable sheep habitat in and near the project area, although it is discontinuous and the presence of timber compromises security. The project area is the Middle Main Salmon population management unit. The last survey year, 2010, found 215 bighorn sheep (129 ewes, 36 lambs, 29 young rams and 21 large, mature rams). The local herd nearest the project is located in Warm Springs and Camas Creek drainages, just over the ridge separating Mosquito Creek from Warm Springs Creek. More than likely, there may be an occasional individual or small band that wanders in the project area, then return to more suitable and extensive habitat over the hill in the Warm Springs drainage.

Boreal Owl

Boreal owls occupy boreal forests of North America. On the Salmon-Challis NF and within the project area Boreal owls preferred habitat is spruce/fir, and aspen, followed by lesser degrees by Douglas-fir, lodgepole pine and other mixed conifer (IDFG, 2005). Preferred nest sites are cavities excavated by large woodpeckers (IDFG, 2005) in mature and old forests with large trees and snags. Boreal owls feed primarily on small mammals such as voles, pocket gophers and mice with favored breeding sites above 5,100 feet in elevation.

Boreal owls have been documented in suitable habitat across the Salmon-Challis NF. Although there are no boreal owl observation records in the project area (specific boreal own surveys have not been conducted in the project area for this project) it is expected that this species occurs within, or nearby the project area in suitable habitat.

Columbia Spotted Frog

Columbia spotted frogs live in springs and seeps, meadows, marches, ponds, streams where there is abundant vegetation and they use riparian corridors for migration routes. A murky substrate appears necessary for hibernation.

Spotted frogs are widespread in suitable habitats in their range and appear to be well-distributed and the most abundant amphibian on the Forest (USDA-FS, Status of the Amended Salmon-Challis National Forest Plans Management Indicator Species Spotted Frog and Pileated Woodpecker., 2004). There are two seasonal/permanent ponds in the project area that have suitable Columbia spotted frog habitat; one pond is on the east side of the project area, section 23, near Forest Road 080. The other is an ephemeral pond near Pine Summit. Numerous ponds are in the project area may provide more habitats for spotted frogs. Available habitat appears stable and is well protected through riparian and fisheries conservation.
measures (USDA-FS, Status of the Amended Salmon-Challis National Forest Plans Management Indicator Species Spotted Frog and Pileated Woodpecker., 2004) Columbia spotted frogs was chosen as management indicator species (MIS) to monitor management effects on water quality and riparian areas.

**Flammulated Owl**

Flammulated owl typical habitat includes ponderosa pine and Douglas-fir stands that are open and generally on a southern/western aspect. The project area contains about 2,900 acres of flammulated owl Douglas-fir habitat, the majority of which is immediately upslope of the Mosquito Flat Reservoir and Challis Creek on gently rolling terrain. Nest cavities are those formed by northern flickers or pileated woodpeckers (ibid) and they prey on insects, in particular moths and beetles (Samson, 2005).

There are no records of this species in or near the project area. Little information is available on regional or range-wide populations, but they appear to be stable (NatureServe, 2014).

**Great Gray Owl**

The great gray owl is a circumpolar species that is strongly associated with lodgepole pine, Douglas-fir, and aspen forest types in Idaho, on the Salmon-Challis and project area. Mature multistory Douglas-fir stands are suitable habitat and are found primarily on the eastern end of the project area near Mosquito Flat reservoir and lodgepole pine on the southern part of the project area. Primary food source is small rodents and similarly sized mammals, but occasionally will include small weasels, hares, small birds and even grogs (Bull & Duncan, 1993).

The great gray owl is found on the Salmon-Challis NF, but none have been observed in or near the project area. Nearest observations are 30-40 miles southwest and west and 30-40 miles northeast of the project area.

**Migratory Bird Assessment**

The Forest has 247 bird species, and 172 are migratory in their habits. The analysis area is predominantly conifer forest (about 8,300 acres of 9,630 proposed project acres) and documentation in the Forest LRMP Environmental Impact Statement (EIS) indicate there are 36 species that use conifer forest, 31 use grass and sagebrush, and 65 use riparian communities. The riparian vegetation thus has a disproportionate influence on bird distribution, but is very limited in the project area and will not be affected by project activities; no further analysis is warranted. The same for grass and sagebrush cover types, therefore, only the conifer habitat was analyzed.

**North American Wolverine**

Wolverines are not associated with specific vegetation types or geological features; rather it has been shown they select habitat that is cold and gets enough snow such that there is deep persistent snow cover late into the spring (USFWS, 2014). Only one area in the head of Challis Creek where snow persist to late May is categorized as suitable habitat (Region 1 Wolverine Habitat modeling that extended to the SCF and project area); although a local Forest model indicated half the project area is potential habitat. The project area is in Game Management Unit 3B and is categorized as Tier II, good potential for wolverine use, but unprotected habitat and climate vulnerability.

They are categorized as opportunistic scavengers; prey includes small mammals, fruits, berries, insects, with elk and deer documented in a study as 12-27%, respectively, of the winter diet (Pasitschniak-Arts & Lariviere, 1995). Wolverines are relatively intolerant of human disturbance, although they do appear to be somewhat tolerant of winter recreational activities that are the most likely to result in human-wolverines encounters.
Northern Goshawk
The northern goshawk is a large forest raptor found in the Arctic, Canada and the United States. In the western US, it is associated most often with mature coniferous forests for nesting, and a wide variety of habitats for hunting prey. They prefer nesting in mature, unmanaged or lightly managed forest habitats with relatively closed canopies and within 600 feet of water (Bull & Hohmann, 1992). Goshawks use a variety of habitats for foraging but seem to prefer mid-to-late successional forest and rarely use openings (Reynolds et al., 1992). There are about 560 acres of nesting habitat and about 1,150 acres of foraging habitat in the project area. There is ample space within the project area for multiple nesting pairs. Stands of suitable habitat are mostly not contiguous in the project area, and this decreases the probability of use as suitable habitat has to be contiguous over a wide area (from 1,400 acres to over 8,500 acres (USDA-FS, 2007). As such, it is highly unlikely that northern goshawks are nesting in the project area, so that nesting habitat is functionally foraging habitat.

Pileated Woodpecker
Pileated woodpeckers commonly occur in the ponderosa pine, Douglas-fir and mixed pine/fir stand where most forested vegetative management occurs on this forest, and are affected by changes in habitats they provide. Pileated woodpeckers were selected as MIS to monitor the effects of management actions on coniferous forests.

All forested conifer habitat in the project area can be considered suitable for pileated woodpeckers. As such, there are about 8,300 acres of habitat cover type with a tree component in the project area. The Forest trend is slightly downward (USDA-FS, 2013), but there had been a regional upward trend in abundance of this species in the past (USDA-FS, 2004).

Three-toed Woodpecker
Three-toed woodpeckers are wide ranging, heavy billed woodpeckers with preference for spruce forests, although they are found in other forest types within its range (Leonard, 2001). The project area provides an area for up to 39 pairs at low density. They specialize in foraging on bark beetles, but will consume wood-boring beetles in lightly or moderately burned trees and unburned trees. Due to the current level of bark beetles, and DFB activity in the project area there is ample food supply for this species.

There is one recorded observation of three-toed woodpeckers about three miles east of the project area, near Twin Creek. The observation is from 1995 and includes at least one adult and one immature bird.

Townsend’s Western Big-eared Bat
Townsend’s big-eared bats are associated with a wide range of vegetative types and require habitat that contains areas for roosting (hide, rest, save energy, digest food, seek shelter/safety, maternity and nursery) and winter hibernation (well-ventilated, cold caves and mine tunnels that allow hanging from the ceiling) (Woodruff & Ferguson, 2005). Moths are the primary prey of Townsend’s big-eared bats (Piaggio, 2005) making up about 90% of their diet with consumption of other invertebrate orders in small amounts. This bat will forage above and within the canopy (Pierson, et al., 1999), often along forest edges and riparian areas (Piaggio, 2005) and is known to drink water.

There are no known big-eared bat roosts in the project area; there are no mine audits. There are no bat species recorded in or near the project area (USDA Forest Service, 2014) however there may be individuals present. Suitable foraging habitat exists across the project area, and there is open water access at the reservoir.

Table 26 displays the above sensitive species general direct and indirect effects, their project specific effected area, and a summary of the potential general direct and indirect effects for the proposed action alternatives (2, 3).
Table 26. USFWS Species with Potential Direct/Indirect Effects with Affected Area.

<table>
<thead>
<tr>
<th>Species</th>
<th>Potential Direct and Indirect effects</th>
<th>Affected Area</th>
</tr>
</thead>
</table>
| **Bighorn Sheep**| It is unlikely there would be direct impacts to bighorn sheep from the action alternatives. Bighorn sheep have not been documented in the project area. There is little in the way of human activity to cause repeated disturbances; no roads access high elevation sheep habitat.  
*Cumulative Impacts* – The only activity ongoing in the project area that may affect bighorn sheep is the grazing which overlaps sheep habitat on forest lands. The overlap would be in preferred habitat for sheep (very steep, at the head of drainages) which is not preferred grazing areas for cattle. The project is likely to have minor beneficial impact of increased habitat quality for bighorn sheep, even when considering the existing impact of grazing activity in the project area. | Typically steep mountains with rock outcrops, canyons and cliffs (Beechum et al., 2007). The only treatment type in this landscape would probably be prescribed fire.  
Cumulative effects analysis area is the project area, with an emphasis on the Challis Creek Allotment. |
| **Boreal Owl**   | Although boreal owls have been documented in suitable habitat across the Salmon-Challis NF there are no documented boreal observation records in the project area. *Note*—project specific boreal surveys have not been conducted. There would be *direct and indirect* short term effects and long term effects to suitable nesting and foraging habitat.  
- Treatment activities may disturb individuals, and possibly injure juveniles that have not fledged. However, the burn windows for applying prescribed fire are likely to be after the birds have fledged. Adults would be able to escape burning operations easily.  
- Mechanical treatments would occur in less preferred habitat (Douglas-fir and lodgepole pine), and those stands are less likely to have nesting owls.  
- The exception is aspen regeneration (1,540 acres) where nesting owls may occur.  
- Nearly all the spruce/fir habitat (preferred) may be impacted by prescribed fire. However, spruce/fir are generally cool, moist soil conditions and are unlikely to be consumed by application of prescribed fire under normal prescribed fire conditions.  
*Cumulative Effects* – Grazing activities would not affect the boreal owls. Firewood cutting may remove some dead Douglas-fir and lodgepole pine, but not to an extent to reduce the availability of the many nesting trees in secondary habitat (spruce and fir). Private land adjacent to the project area is not suitable boreal owl habitat. | In Idaho (and project area) Boreal owls preferred habitat is spruce/fir, and aspen where available  
Preferred acres:  
Prescribed fire only 208 acres  
Aspen Restoration 21 acres  
Other acres:  
Overstory Removal 112 acres  
Thinning 1,460  
Prescribed fire only 4,511 acres  
Cumulative effects analysis area is the entire project area, for a period of 200 years. |
**Columbia Spotted Frog**

There is unlikely to be any direct impacts to spotted frogs as the two observation records in the project area (pond habitat) and project area riparian areas have few trees and riparian buffers are practiced. Only two ponds with records in or near the project area.

Upland habitat may have *indirect effects* through thinning and prescribed fire treatment/activities.

a) First year or two, after treatment, there will be a decrease in ground cover as grass, forbs, and shrub cover will be reduced.

b) After two years, these features will increase in abundance and provide moist microsite characteristics more suitable for frogs in upland areas.

c) Treatments would reduce the risk that a stand replacement fire would occur that could lead to increased sedimentation delivery to streams. This decrease in fire risk decreases the likelihood that fine sediment would compromise reproduction habitat.

**Cumulative Effects** – Grazing is the only measurable cumulative impact to spotted frogs and their habitat. There is two ponds in the project area with spotted from records and presence; which overlaps with the water needs for grazing cattle. It is unlikely that the effects from the Mosquito Flat project will add to the effects from grazing such that, when combined, spotted frogs would be adversely affected.

**Flammulated Owl**

There would be *direct and indirect* short term effects and long term effects to suitable nesting and foraging habitat.

- The primary effects of implementing the proposed actions are to flammulated owl habitat. As a byproduct of proposed treatments a decrease in canopy cover will increase flammulated owl habitat quality. This treatment will be most apparent in the stands dominated by Douglas-fir.
- The overstory removal cut will affect very little flammulated owl habitat. The aspen restoration cut will affect about 180 acres of flammulated owl habitat by decreasing available nesting habitat, but along the margins of treatment areas forage quality will improve.
- Prescribed burning treatment will occur on the largest amount of owl habitat resulting in overall canopy opening, which may increase suitable habitat; without consuming it to the extent where habitat would be lost on a large scale.

**Cumulative Effects** – The private inholdings near the reservoir have no effect on flammulated owls or their habitat as there is no suitable habitat present. Initially grazing may be beneficial because livestock can keep woody shrubs from becoming very dense, thereby maintaining

<table>
<thead>
<tr>
<th>Cumulative Effects – Grazing is the only measurable cumulative impact to spotted frogs and their habitat. There is two ponds in the project area with spotted from records and presence; which overlaps with the water needs for grazing cattle. It is unlikely that the effects from the Mosquito Flat project will add to the effects from grazing such that, when combined, spotted frogs would be adversely affected.</th>
<th>Cumulative effects analysis area is the entire project area, for the duration of the project.</th>
<th>Cumulative effects analysis area is the entire project area, for the duration of the project.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two observation records for presence in suitable habitat in the project area. One pond is on the east side of the project area, section 23, near Forest Road 080. The other is an ephemeral pond near Pine Summit.</td>
<td></td>
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</tbody>
</table>
open habitat for the owl. Firewood cutting does not affect enough Douglas-fir habitats in the project area because there is limited access and ample dead trees for nesting habitat.

**Great Gray Owl**

It is unlikely there would be *direct and indirect* short term effects and long term effects to suitable nesting and foraging habitat.

- Alternative 2-activities would not occur until after the owl young have fledged.
- Alternative 3-all owls will be either adults or independent juveniles and is unlikely to be disturbed, injured, or killed (if present in the project area) because they are very mobile.
- Thinning treatments immediately reduce forest density and the following season will increase great gray own prey habitat and forage specie.
- Retention of large diameter snags and greater spacing of large diameter retention trees will provide large diameter future snags for nesting structures.

**Cumulative Effects** – Private inholdings near the reservoir will have no effect on the owls as there is not habitat present for owls there. Livestock grazing may increase (short-term) suitable owl foraging success because vegetation is kept low, making prey more visible. Firewood cutting has the potential to remove large diameter snags that are suitable for nesting habitat. This is mitigated by the fact firewood cutting generally occurs along the roadways and there is no shortage of snags in the project area.

**Migratory Bird**

There would be potential *direct and indirect* short term or long term effects to migratory birds and nesting habitat:

- In general, forested stand will improve resilience, increase tree stand vigor, resulting in less susceptibility to insects, disease and catastrophic fire.
- Aspen and riparian communities would experience short term disturbance during project implementation but long term benefits due to increase acreage and reduced potential for catastrophic fire in riparian habitats.
- Alternative 2 may have minor adverse effects during project implementation because of the summer migratory period. Alternative 3 winter logging operations would not have this effect.
- Any potential effects to migratory birds are restricted to the project area, and would not extend to the Forest scale.
- Forest Plan adherence and project design criteria considerations may benefit migratory birds by adherence to riparian buffer requirements, woody debris retention guidelines, adherence to prescribed fire plans and prescriptions and proposed implementation periods which allow many nestlings to fledge prior to project activities.

| Prescribed fire treatment only-35 acres of Douglas-fir habitat and about 475 acres of lodgepole pine. |
| Cutting treatments- about 315 acres of Douglas-fir and less than 10 acres of lodgepole pine would be thinned and less than 20 acres would be overstory removal. |
| Cumulative effects analysis area is the entire project area, for a period of 20 years. |
| Overstory removal changes existing forested habitat for 120 acres for Alternative 2 and 50 acres for Alternative 3. |
| Broadcast burning over 7,565 acres occurs late season and would not likely affect migratory birds. Variation of effects would occur between prescribed fire only acres and cutting treatments followed up by prescribed fire treatments. |
| Aspen treatments would increase aspen habitat by 224 acres for Alternatives 2 and 3. |
Cumulative Effects – The only other action occurring within the project area that would affect migratory birds are grazing and firewood cutting. The two year rest treatment of the allotment area would benefit ground nesting birds, immediately. After two years, there may be adverse impacts to some ground nesting species; it will vary by timing of cattle returned to grazing and if young birds have fledged yet. Firewood cutting affects very little migratory bird habitat because road access is very limited in the project area and firewood cutting generally occurs along roads.

<table>
<thead>
<tr>
<th>North American Wolverine</th>
<th>Cumulative effects analysis area is the entire project area, for a period of 10 years beyond project implementation period.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct effects to wolverines were found to be discountable because of the following:</td>
<td>On the Salmon-Challis NF and project area suitable wolverine habitat and observations are found at high elevations; but only one area in the head of Challis Creek has snow that persists to late May (preferred habitat feature).</td>
</tr>
<tr>
<td>Action alternatives activities are not expected to greatly increase human presence beyond the existing and apparently tolerable level for wolverines.</td>
<td>Cumulative effects analysis area is the entire project area, for the duration of the project.</td>
</tr>
<tr>
<td>Due to the extremely low-density of wolverine populations, it is very unlikely any wolverines would be encountered.</td>
<td></td>
</tr>
<tr>
<td>Indirect effects to wolverines were found to potentially offset each other in the long term:</td>
<td></td>
</tr>
<tr>
<td>Project activities would alter vegetation in suitable wolverine habitat that may result in affects to wolverine prey. In the long-term, following action alternative activities, vegetative diversity increases and there may be more prey forage and cover.</td>
<td></td>
</tr>
<tr>
<td>Cumulative effects –on forest lands some of the grazing allotments and firewood overlaps with wolverine habitat. Potential resource conflict with livestock and firewood gathering are low due to the wide-ranging, low density, non-specific vegetative type and structure requirements of the wolverine. Effects of livestock grazing and firewood harvesting are discountable.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Northern Goshawk</th>
<th>There are about 560 acres of nesting habitat in the project area. Stands of suitable habitat are mostly discontinuous, which decreases the probability of use.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct and indirect effects to goshawks are unlikely as there are no known birds (observed/surveyed) or active territories (breeding, nesting, and preferred habitat area) in the project area.</td>
<td></td>
</tr>
<tr>
<td>Indirect impacts/affects:</td>
<td></td>
</tr>
<tr>
<td>• Disturbance to individuals and changes to habitat, but since there is so little habitat in the project area disturbance is very unlikely.</td>
<td></td>
</tr>
<tr>
<td>• Mechanical treatments will affect about 115 acres of project area goshawk habitat by implementing thinning treatments resulting in reduced canopy cover and understory vegetation density; which in turn results in reduced quality of foraging habitat for approximately ten years.</td>
<td></td>
</tr>
<tr>
<td>• As understory vegetation returns and remaining crown closure increases in mechanical treatments units, quality of foraging habitat will increase until 20 – 40 years after treatment when underburning may be reapplied.</td>
<td></td>
</tr>
<tr>
<td>a) 115 thinning acres</td>
<td></td>
</tr>
<tr>
<td>b) 1,020 burning acres</td>
<td></td>
</tr>
</tbody>
</table>
- Prescribed burning only treatments will affect 1,020 acres of project area goshawk habitat by reducing understory and canopy vegetation density; which in turn results in reduced quality of foraging habitat and may reduce habitat quality for about ten years. Potential for multiple affects as planned prescribed burning treatments will occur every 20 to 40 years.
- In general, prescribed burning and mechanical treatments will have only a minor effect on goshawk habitat because the existing habitat is discontinuous and composed of many fire-resistant trees.
- In the long-term proposed treatments will create more fire resistant habitat and increase vegetation diversity, which will benefit goshawk prey habitat.

*Cumulative effects* – Activities on the private inholdings have no cumulative effect on the goshawk. Firewood removal reduces primarily dead snags and in particular along forest roads. The effect on goshawk or their habitat is not measureable and is inconsequential.

Cumulative effects analysis area is the entire project area, for a period of 40 years.

### Pileated Woodpecker

<table>
<thead>
<tr>
<th>There would be <em>direct and indirect</em> short term effects and long term effects to suitable nesting and foraging habitat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- There may be disturbance from project activities, but it is unlikely to affect reproductive activities or nesting success, especially at the Forest wide scale.</td>
</tr>
<tr>
<td>- The action alternatives may increase forest health by increasing residual tree spacing, thereby decreasing insect-susceptibility and reducing foraging habitat quality.</td>
</tr>
<tr>
<td>- Fuel reduction activities would subsequently reduce fire risk, which would increase stand resiliency for the long term.</td>
</tr>
<tr>
<td>- Prescribed fire activities may result in an increase in snags in treatment areas; retention of existing and new snags would maintain this important habitat attribute.</td>
</tr>
</tbody>
</table>

*Cumulative Effects* – The only ongoing activity that could affect pileated woodpeckers and their habitat is firewood cutting. However, firewood cutting has a limited impact because it occurs mostly along forest roads, which are sparse in the project area. Therefore, this project will not add significant cumulative effects to those occurring from other activities.

There are about 8,300 acres of conifer habitat cover type (suitable habitat) with a tree component in the project area.

The analysis area for cumulative effects is the entire project area for 30 years.

### Three-toed Woodpecker

<table>
<thead>
<tr>
<th>There would be short term and long term <em>direct and indirect effects</em> to suitable nesting and foraging habitat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Thinned stands (mechanical and mechanical with burning treatment) will be more resilient to beetles attack, and therefore less suitable for foraging habitat and sites.</td>
</tr>
<tr>
<td>- In the prescribed fire only treatment areas there may be an increase in dead and injured trees, and thus an increase in habitat and foraging quality.</td>
</tr>
</tbody>
</table>

8,100 acres of potential habitat would be affected. Alternative 2 would treat slightly more acres than Alternative 3 due to seasonality of operations.
• In the long term retained trees will grow larger with greater spacing, increasing suitable, potential nesting sites.
• In the distant future stands of very large trees may be more susceptible to beetles and become suitable foraging sites.
• Potential impacts to three-toed population are low because they have not been recently observed in the project area.
• Adjacent areas with very recent fire activity are very large and provide much habitat for three-toed woodpeckers; combined with proposed prescribed burning treatments in the project area even more suitable habitat will be available in the project area and on the Forest.

*Cumulative effects* – Firewood cutting may have a minor cumulative effect for three-toed woodpeckers as it may decrease potential nesting and foraging habitat along the road-accessible area of the project boundary. Activities on private land and grazing allotment would not affect the woodpecker.

| Townsend’s Western Big-eared Bat | It is unlikely the action alternatives would have *direct or indirect* impacts for Townsend’s big-eared bats because they do not appear to be present in the project area.
• There may be minor indirect impacts to big-eared bats habitat in the short term, as there is the potential for less foraging vegetative diversity and lowered fire and insect infestation risk in the long term.
• Thinning and burning treatments would in effect open Douglas-fir, ponderosa pine and lodgepole habitat, which would be more suitable than the existing dense conditions and may potentially increase prey habitat.

*Cumulative effects* – firewood cutting and grazing do not contribute substantial effects to big-eared bat use of their habitat in the project area currently. Neither grazing nor cutting of dead trees would alter their activity. | Alternative 2 - 1,732 total acres of thinning treatments that would be a reduction in habitat quality and potential nesting sites; 5,833 acres of prescribed fire only treatments would increase habitat quality in burn only units.

Alternative 3-same acres but slightly less in total acres due to treatments areas that will be unavailable for winter operations due to percent slope, frozen ground and inaccessibility.

Cumulative effects analysis area is the entire project area, for the duration of the project.

Suitable foraging habitat exists across the 9,630 proposed project areas.

Habitat affected is the sum of all treatments units, approximately 9,630 acres.
Summary of Effects

It was the specialists (Hill, 2014) determination that either action alternatives may affect individuals, but is not likely to result in a trend toward federal listing or loss of viability for all sensitive species listed above in Table 26. This determination is based on the following rationale that is summarized and generalized to all the sensitive species:

- Mechanical and prescribed burning treatments unlikely to adversely affect specie(s).
- Mechanical and prescribed burning treatment design features, operational periods, adherence to plans, rules and regulations mitigate potential impacts.
- Short term negative affects often offset by long term positive affects to habitats.
- Preferred habitats not likely present in project area, or are available in adjacent areas and availability of secondary suitable habitat in the Mosquito Flat area.
- Habitat areas and conditions very broad and include entire forest.
- Increase in, and retention of, snags and large trees increase and decrease differing species habitat and nesting requirements, but is generally unlikely to adversely affect them.
- Specie(s), species habitat and/or species nesting/territory not observed in or near project area.

3.12 Summary of Findings Required Applicable Laws

**National Environmental Policy Act:** The EA and Decision Notice/Finding of No Significant Impact document are in compliance with NEPA and the Council on Environmental Quality regulations (40 CFR 1500-1508) for Implementing NEPA.

**Clean Water Act, Executive Order 11990 (wetlands) and 11988 (floodplains):** This decision is consistent with the Clean Water Act and amendments. There are no anticipated impacts to wetlands and floodplains from project implementation. Application of design criteria for soil and water protection and provisions of the Idaho Forest Practices Act are expected to achieve compliance with the Idaho Water Quality Standards and Wastewater Treatment Requirements. Beneficial uses will be maintained in the MFFR project area.

**Executive Order 12898, “Environmental Justice”:** This decision was assessed to determine whether it will disproportionately impact minority or low-income populations. No minority or low-income populations were identified during public involvement activities. The decision will not amend or preclude any existing private or treaty rights in the project area.

**National Historic Preservation Act:** The project area has been surveyed for heritage resources. Based on designed criteria and avoidance mitigation and consultation concurrence on April 12, 2016 from the State Historic Preservation Office, no effects to National Register eligible or listed heritage resources will occur (see Item 8 of the FONSI for more detail on this finding).
Clean Air Act: Prescribed burning activities are designed to comply with provisions of the Montana/Idaho State Airshed Group Operating Guide to minimize the chances for air quality parameters to exceed regulatory limits defined in the Clean Air Act.

Migratory Bird Treaty Act, Executive Order 13443 “Facilitation of Hunting Heritage and Wildlife Conservation”: Project treatment activities are anticipated to promote habitat conditions that will favor neotropical migratory and resident birds. Although hunting opportunity may be enhanced in the short term as a result of thinning activities, the maintenance of existing travel closures, especially during hunting season, and fire prescriptions anticipated to maintain hiding cover values, will likely provide maintenance of habitat conditions suitable for big game and long-term future hunting opportunities.

Endangered Species Act (ESA): This decision is consistent with the Endangered Species Act. A Fisheries Biological Assessment and Evaluation was completed on May 21, 2016. A Wildlife Biological Assessment of Endangered, Threatened Species and Biological Evaluation Forest Service Sensitive Species was completed on December 17, 2014 and revised on September 7, 2016. A Biological Assessment and Evaluation for Sensitive, Threatened and Endangered Plant Species was prepared on August 14, 2103. Determinations for these Biological Assessments and Evaluations are outline in Item 9 of the attached FONSI. Under Joint Counterpart ESA Section 7 Consultation Regulations these determinations did not require concurrence from US Fish & Wildlife Service and NOAA National Marine Fisheries Service.

National Forest Management Act: The National Forest Management Act and accompanying regulations require several evaluations and specific findings be documented at the project level:

Forest Management Indicator Species (MIS): Consistent with regulations at 36 CFR 219.19, the action alternative was evaluated for potential impacts (direct, indirect and cumulative) to habitats for pileated woodpecker, Columbia spotted frog, and bull trout, which are the Management Indicator Species known to occur in the project area. This evaluation, as documented in chapter 3, sections 3.5 and 3.11, of this document determined that viable populations of MIS will be maintained in the project area. This determination is consistent with forest-wide trends for populations and habitat conditions for these MIS.

Forest Plan Consistency: The decision to implement Alternative 2 with changes is consistent with the Challis National Forest Land and Resource Management Plan, its goals, objectives, standards, and guidelines as outlined in the EA on pages 3, 9 & 45-49. The project objectives parallel management area direction for Management Prescriptions 3A, 4A & 5A which is prescribed for the project area. This consistency also includes the Forest Travel Plan, PACFISH Amendment (Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon, Washington and Idaho and portions of California), Old Growth, Biological Evaluations and Surveys, and Detrimental Soil Disturbance.

Idaho Roadless Rule (2008): Only broadcast burn activities would occur in the Challis Creek Inventoried Roadless Area, in a total of 5,276 acres. No timber cutting, sale, and removal nor road construction, reconstruction or maintenance is planned in the IRA. This is consistent with the permissions and prohibitions governing the type of activities that can occur in IRA’s as specified in the final rule (36 CFR Part 294).
## 4.0 List of Primary Preparers

<table>
<thead>
<tr>
<th>Name, Position Title</th>
<th>Resource Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christine Droske, Fire Ecologist</td>
<td>ID Team Leader, Air Quality Report, Lodgepole Fire Addendum</td>
</tr>
<tr>
<td>Salmon-Challis National Forest</td>
<td></td>
</tr>
<tr>
<td>Vicki Van Sickle, Botanist</td>
<td>Botany BA/BE</td>
</tr>
<tr>
<td>Ecosystem Management, Inc.</td>
<td></td>
</tr>
<tr>
<td>John Rose, Archaeologist</td>
<td>Cultural Resource Report, SHPO Concurrence</td>
</tr>
<tr>
<td>Salmon-Challis National Forest</td>
<td></td>
</tr>
<tr>
<td>John Fowler, Fuels Specialist</td>
<td>Fire and Fuels Specialist Report</td>
</tr>
<tr>
<td>Salmon-Challis National Forest</td>
<td></td>
</tr>
<tr>
<td>Bart Gamett, Fish Biologist</td>
<td>Fisheries Specialist Report, BA/BE and Consultation</td>
</tr>
<tr>
<td>Salmon-Challis National Forest</td>
<td></td>
</tr>
<tr>
<td>Eric Moser, Hydrologist</td>
<td>Hydrology Report</td>
</tr>
<tr>
<td>USFS A&amp;B Enterprise unit</td>
<td></td>
</tr>
<tr>
<td>David Morris, TMA</td>
<td>Non-Forested Vegetation Report and HRFA / Old Growth consultation</td>
</tr>
<tr>
<td>Salmon-Challis National Forest</td>
<td></td>
</tr>
<tr>
<td>Rory Glueckert, Recreation Planner</td>
<td>Recreation and Visual Quality Specialist Reports</td>
</tr>
<tr>
<td>Salmon-Challis National Forest</td>
<td></td>
</tr>
<tr>
<td>Erin Pierson, Presale Forester</td>
<td>Silvicultural Report</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Sean Hill, Wildlife Biologist</td>
<td>Wildlife Specialist Report and BA/BE</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Ken Rodgers, NEPA Team Leader</td>
<td>Idaho Roadless compliance and overall project guidance in NEPA policy requirements and direction</td>
</tr>
<tr>
<td>Salmon-Challis National Forest</td>
<td></td>
</tr>
</tbody>
</table>
References


Beechum et al. (2007). Rocky Mountain Bighorn Sheep. USDA Forest Service, Rocky Mountain Region.


Samson. (2005). *A Conservation assessment of the northern goshawk, blacked-backed woodpecker, flammulated owl, and piledated woodpecker in the Northern Region.* USDA, Northern Region.


USDA-FS. (2007). *Northern Goshawk Northern Region Overview: Key Findings and Project Considerations*. Missoula, MT: USDA Forest Service Northern Region.


Van Sickle, V. (2013). *Biological Assessment/Evaluation for Sensitive, Threatened, and Endangered Plants of the Salmon-Challis NF*


Appendix A: Maps

Figure 4. MFFR Project Challis Creek Management Area #21 Map.
Figure 5. MFFR Project Fuels Reduction Action Area Map.
Figure 6. MFFR Project Vicinity Map
Figure 7. MFFR Project Fuel Reduction Project Area and Treatment Units Map.
Figure 8. MFFR Proposed Temporary Roads Map.
Figure 9. MFFR Project Lodgepole Fire Map.
Figure 10. MFFR Project Area Wildland Urban Interface as Identified by the Custer County Community Wildfire Protection Plan.
Figure 11. Fire Condition Class Rating (FRCC) for the MFRR Project Area.
Figure 12. MFFR Project Challis Creek C&H Allotment Acres Map.
Figure 13. Hydrology Map for the MFFR Project.
Appendix B: Project Catalog of Activities and Actions for Cumulative Effects Analysis

Table 27. Catalog of Activities.

*This table represents past, present, and reasonably-foreseeable future activities for which direct and indirect effects that may overlap in space and time for the MFFR No-Action, Proposed Action and Winter Logging Alternatives (Alternatives 1, 2, and 3, respectively).*

<table>
<thead>
<tr>
<th>ACTIVITIES &amp; ACTIONS</th>
<th>PAST</th>
<th>PRESENT (ONGOING)</th>
<th>REASONABLY FORESEEABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Timber Harvest</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Project: Year, silvicultural activity name % basal area removal, HUC 5 watershed)</td>
<td>See Table 28 below</td>
<td>Periodic and fuelwood collections for personal use, limited to areas within 300 feet of open system roads, but not within PACFISH RHCA's.</td>
<td>Follow-up fuels reduction thinning approximately 30-40 years in the future in some stands with cutting activities proposed under Alternative 2. Future periodic and fuelwood collections for personal use, limited to areas within 300 feet of open system roads, but not within PACFISH RHCA's.</td>
</tr>
<tr>
<td><strong>Mining &amp; Mineral Materials</strong></td>
<td>Late 1800’s- early 1990’s exploration for locatable; very limited extraction and very minor/ephemeral impacts.</td>
<td>No current plans of operation (POO) for locatable or for existing mineral material pit expansion or new mineral material pit development.</td>
<td>No (POO) anticipated; mineral potential low; No additional material pit expansion or large quantity uses planned.</td>
</tr>
<tr>
<td><strong>Grazing</strong></td>
<td>Unregulated and regulated (since 1906) grazing of horses, cattle and sheep since early settlement of area in 1870’s. Regulated use of federal cattle grazing allotments since ~1906</td>
<td>Challis Creek Cattle and Horse grazing allotment authorizing two Permittee’s to run 256 Cow/calf pairs during the period from 06/15- 09/14.</td>
<td>Continued grazing of cattle; maintenance of limited developments.</td>
</tr>
<tr>
<td>Resource Inventory &amp; Monitoring</td>
<td>Plant communities, wildlife &amp; fish habitat/populations, soil/water/air resources, human uses, etc.</td>
<td>Ongoing by federal, state management or regulatory agencies; non-governmental individuals/organizations</td>
<td>Continued activity based on information needs and/or requirements</td>
</tr>
<tr>
<td>Transportation System-Road/Trail Construction, Maintenance, Use</td>
<td>Roads to historic mining districts, private property logging areas and recreation sites/trailheads/backcountry areas</td>
<td>Currently there are 36.4 total miles of system and unauthorized roads in the Upper Challis Creek Subwatershed with road density of 0.9357 mi/mi². System trails total 5.4 miles. Routine maintenance of main arterial roads, trails as needed.</td>
<td>Continued management of existing road/trail system. Routine maintenance of main arterial roads, trails as needed or as funded.</td>
</tr>
<tr>
<td>Special Uses</td>
<td>Similar to present activities in recent decades.</td>
<td>Maintenance of Mosquito Flat Dam, ditch and diversions, and commercial outfitting</td>
<td>Continued use under permits</td>
</tr>
<tr>
<td>Dispersed Recreation</td>
<td>Backcountry use, horseback riding, fishing, hunting, backpacking, camping, sightseeing, mountain biking, rock-hounding, sledding, ski touring &amp; telemark, snow machining, mushroom harvesting.</td>
<td>Activities ongoing, current use considered light.</td>
<td>Activities would continue</td>
</tr>
<tr>
<td>OHV Use and Management</td>
<td>Limited regulation prior to 1987 Challis NF Travel Plan except for road closures and other use restrictions controlled by gates and/or physical road closures.</td>
<td>Motorcycling, ATV, snow-machining and 4WD use on Forest lands according to current Travel Plan which allows unrestricted access except for limited routes closed to vehicles over 50” width or motorized use.</td>
<td>New Travel Plan, completed in 2009, emphasizes closure of public lands to motorized use except for designated routes.</td>
</tr>
<tr>
<td>Fuelwood Gathering</td>
<td>National Forest lands where accessible by transportation system</td>
<td>Continued use dependent on seasonal access and other available fuelwood sources in proximity to communities.</td>
<td>Continued use in accessible areas.</td>
</tr>
</tbody>
</table>

6/15 to 09/14. Rangeland development maintenance on water and fences across the allotment.
| Fire Suppression | USFS has primary responsibility on public and private lands for fire suppression. | During the summer of 2013 the Lodgepole Fire covered over 20,000 acres in the watershed with 2,065 acres of the proposed project area. Of the 21,000 acres only 7% was impacted by high soil severity damage. Current fires would be managed according to strategies determined through application of Appropriate Management Response. | Wildland fires will continue to occur in the area and suppression efforts, as appropriate, will be made to control those fires. Suppression related activities will continue to be rehabbed. |
| Prescribed Burning and Fuels Reduction | Records of past burning activities are unavailable. Common practices and on-site evidence indicates that jackpot and pile burning of logging and thinning slash likely occurred | Pile and jackpot burning of slash from thinning, fuels reduction and fuelwood gathering activities. | Continued pile and jackpot burning of slash from thinning, fuels reduction and fuelwood gathering activities. Prescribed broadcast burning not planned at this time. |
| Noxious Weed Management | Limited hand, mechanical, chemical treatment since 1960’s | Hand, mechanical, chemical, control methods | Continued integrated management with emphasis on preventative measures, actions. |
Table 28. Past Timber Harvest Activities.
This table displays past timber harvest activities in the Mosquito Flat Fuels Reduction Project Area.

<table>
<thead>
<tr>
<th>Location_Site</th>
<th>Cover Type</th>
<th>Current percent canopy closure</th>
<th>Harvest types</th>
<th>Harvest year</th>
<th>Sale Name</th>
<th>Second Harvest year</th>
<th>Second Sale name</th>
<th>Total Percent Canopy Removal</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>20020112</td>
<td>DF</td>
<td>10</td>
<td>ST</td>
<td>2000</td>
<td>Pine Mill</td>
<td>0</td>
<td></td>
<td>90</td>
<td>30.6</td>
</tr>
<tr>
<td>20020110</td>
<td>DF</td>
<td>20</td>
<td>CC</td>
<td>2000</td>
<td>Pine Mill</td>
<td>0</td>
<td></td>
<td>100</td>
<td>5.2</td>
</tr>
<tr>
<td>20020101</td>
<td>DF</td>
<td>30</td>
<td>SW</td>
<td>1990</td>
<td>Pine Mosquito</td>
<td>1993</td>
<td>Pine</td>
<td>70</td>
<td>17.3</td>
</tr>
<tr>
<td>20020107</td>
<td>DF</td>
<td>10</td>
<td>CC</td>
<td>2003</td>
<td>Mosquito Flat Hazard</td>
<td>0</td>
<td></td>
<td>100</td>
<td>11.7</td>
</tr>
<tr>
<td>20020103</td>
<td>DF</td>
<td>30</td>
<td>SW</td>
<td>1990</td>
<td>Pine Mosquito</td>
<td>1993</td>
<td>Pine</td>
<td>70</td>
<td>27.0</td>
</tr>
<tr>
<td>20010003</td>
<td>DF</td>
<td>50</td>
<td>ITM</td>
<td>1978</td>
<td>Pine Summit</td>
<td>2004</td>
<td>Corkscrew Mtn.</td>
<td>50</td>
<td>36.0</td>
</tr>
<tr>
<td>20020114</td>
<td>DF</td>
<td>10</td>
<td>ST</td>
<td>2000</td>
<td>Pine Mill</td>
<td>0</td>
<td></td>
<td>70</td>
<td>5.3</td>
</tr>
<tr>
<td>20280111</td>
<td>DF</td>
<td>30</td>
<td>ST</td>
<td>1990</td>
<td>Pine Mosquito</td>
<td>0</td>
<td></td>
<td>70</td>
<td>10.7</td>
</tr>
<tr>
<td>20020115</td>
<td>DF</td>
<td>30</td>
<td>SW</td>
<td>2000</td>
<td>Pine Mill</td>
<td>1993</td>
<td>Pine</td>
<td>70</td>
<td>5.1</td>
</tr>
<tr>
<td>20020102</td>
<td>DF</td>
<td>30</td>
<td>ST</td>
<td>1990</td>
<td>Pine Mosquito</td>
<td>1993</td>
<td>Pine</td>
<td>70</td>
<td>12.4</td>
</tr>
<tr>
<td>20280109</td>
<td>DF</td>
<td>20</td>
<td>ST</td>
<td>1990</td>
<td>Pine Mosquito</td>
<td>0</td>
<td></td>
<td>70</td>
<td>33.3</td>
</tr>
<tr>
<td>20020105</td>
<td>DF</td>
<td>30</td>
<td>ST</td>
<td>1990</td>
<td>Pine Mosquito</td>
<td>1993</td>
<td>Pine</td>
<td>70</td>
<td>94.8</td>
</tr>
<tr>
<td>20020104</td>
<td>DF</td>
<td>40</td>
<td>SW</td>
<td>1990</td>
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Appendix C: Threatened and Sensitive Species of the Salmon-Challis National Forest

Threatened Species:
1. Utah lady tress (*Spiranthes diluvialis*)

Sensitive Species:
1. Lost River milkvetch (*Astragalus amnis-amissi*)
2. Lemhi milvetch (*Astragalus aquilonius*)
3. Mesic (meadow) milkvetch (*Astragalus diversifolius*)
4. White Clouds milkvetch (*Astragalus vexilliflexus var. nubilus*)
5. Maritime sedge (*Carex incurviformis*)
6. Douglas’ biscuitroot (*Cunopterus douglassii*)
7. Rockcress draba (*Draba densifolia var. apiculate syn. Draba globosa*)
8. Stanley whitlow-grass (*Draba trichocarpa*)
9. Guardian buckwheat (*Eriogonum meledonum*)
10. Welsh buckwheat (*Eriogonum capistratum var. welshii*)
11. Challis crazyweed (*Oxypotrichis besseyi var. salmonensis*)
12. Lemhi penstemon (*Penstemon lemhiensis*)
13. Marsh’s bluegrass (*Poa abbreviate spp. Marshii*)
14. Wavy-leaf thelypodium (*Thelypodium rapandum*)
15. Idaho pennycress (Aka Stanley thlaspi) (*Thlaspi idahoensis var. aileeniae syn. Noccaea idahoensis var. aileeniae*)
16. Sacajawea’s bitterroot (*Lewisia scagawean*)
17. Pink agoseris (*Agoseris lackschewitzii*)
18. Flexible alpine collomia (*Collomia debilis var. camporum*)
19. Salmon twin bladdedpod (*Physaria didyomcarpa var. lyrata*)
20. Idaho range lichen (*Xanthoparmelia idahoensis*)
21. Whitebark pine (*Pinus albicaulis*)

The pre-field review determined several of the sensitive plants range or appropriate habitats are not present in the project area and were eliminated from further ground based surveys

1. Lemhi milvetch (*Astragalus aquilonius*)
2. Maritime sedge (*Carex incurviformis*)
3. Douglas’ biscuitroot (*Cumopterus douglassii*)
4. Rockcress draba (*Draba densifolia var. apiculate syn. Draba globosa*)
5. Stanley whitlow-grass (*Draba trichocarpa*)
6. Guardian buckwheat (*Eriogonum meledonum*)
7. Lemhi penstemon (*Penstemon lemhiensis*)
8. Marsh’s bluegrass (*Poa abbreviate spp. Marshii*)
9. Pink agoseris (*Agoseris lackschewitzii*)
10. Flexible alpine collomia (*Collomia debilis var. camporum*)
11. Salmon twin bladdedpod (*Physaria didyomcarpa var. lyrata*)
12. Idaho range lichen (*Xanthoparmelia idahoensis*)