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Clackamas Fires Roadside Danger Tree Environmental Assessment

Clackamas River Ranger District
Mt. Hood National Forest
Clackamas, Marion, and Jefferson Counties, Oregon

The project is located in T.4 S., R.5 E.; T.4 S., R.6 E.; T.5 S., R.4 E.;
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Cover Page Photos: USDA, 2020

Top Photo: National Forest System Road 5400000 near Fish Creek Campground.

Bottom Photo: National Forest System Road 4500000.

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1.0 Introduction

A large portion of the Clackamas River Ranger District (the District), in the Mt. Hood National Forest (the Forest), was affected by wildfires and is currently closed to public access due to the presence of dangerous conditions (i.e., unstable slopes prone to rock fall; fire affected trees prone to failure and falling; and infrastructure damaged by the fires) on and immediately adjacent to National Forest System (NFS) roads. This environmental assessment defines the planning area as the areas within the fire burn perimeters of the Riverside and Lionshead fires of 2020, and the Bull Complex fire of 2021. The proposed action map is attached as a separate document to this environmental assessment (EA) as Appendix C. Maps for this project are available on the project website.

The proposed action is informed by the areas associated with roads where danger tree cutting, and travel management-related actions are proposed. This assessment addresses the following elements of the proposed action:

- Striking distance: Determine and describe the distance from roads to cut danger trees.
- Danger tree criteria: Describe how danger trees would be assessed and identified.
- Disposition of cut trees: Evaluate whether cut danger trees would be left on-site or removed.
- Travel management: Identify which roads to include for danger tree mitigation work, closure, or decommissioning.

The proposed action is designed to achieve and be consistent with the goals of the Mt. Hood National Forest Land and Resource Management Plan, as amended. Based on a review of field conditions and available data, there are needs and opportunities to provide safe access to the burned portion of the District. The Forest Service has heard clearly from our local communities that there is strong desire to access areas on the District that have been closed since 2020. This project would result in the opportunity to implement a thoughtful phased approach to re-opening the District and ensuring a safer return to the fire-affected portions of the District. An interdisciplinary team of agency resource specialists has developed the proposed action to address reentry needs and travel management opportunities.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project record. Specialist reports documenting analyses are incorporated by reference and summaries of each are included by resource topic in section Environmental Consequences. All mileage and acreage calculations provided in this assessment are considered approximate. The term “approximate[ly]” is not present preceding a description of miles, acres, quantities, or other numerical data but should be understood as such unless otherwise noted. Data is derived from a number of different systems including (but not limited to) geographic information systems (GIS) and the infrastructure application (INFRA).

1.1 Background

In 2021, two decision memos were signed for post-fire recreation-related needs. One decision memo titled, [Clackamas Fires Danger Tree Abatement - Developed Recreation and Administrative Sites](#),¹ authorized the cutting of danger and hazard trees in developed

¹ https://www.fs.usda.gov/nfs/11558/www/nepa/115185_FSPLT3_5658936.pdf

recreation areas and at administrative sites affected by the fires. The other decision memo titled, [Clackamas Post-fire Recreation Site and Trail Repair Project](https://www.fs.usda.gov/nfs/11558/www/nepa/116390_FSPLT3_5685201.pdf),² authorized recreation site and trail repairs. This environmental assessment does not supersede or change anything associated with either of those recreation-related decisions. A third decision memo titled, [Clackamas Fires Danger Tree Abatement - Roads](https://www.fs.usda.gov/nfs/11558/www/nepa/115185_FSPLT3_5658328.pdf)³ (also referred to as the 2021 Danger Tree Decision Memo), was also signed. This environmental assessment may replace that decision memo upon completion of a finding of no significant impact and signing of the decision notice.

Striking Distance

The 2021 Danger Tree Decision Memo authorized the cutting of danger trees within a striking distance of one tree-height of roads identified as high and very high priorities for danger tree treatment. The decision to only address danger trees within one tree-height was, in part, due to some public interest to restrict treatment areas. Also, it was generally expected that one tree-height would minimally represent the most urgent zone where falling trees are very likely to strike the road and endanger road users. The one tree-height restriction, while authorizing the cutting of some danger trees, would not have satisfactorily addressed roadside danger tree risks, and therefore, would not have resulted in fully restoring access to NFS roads within the burned areas.

This environmental assessment reevaluates the striking distance of danger trees along roads for the purpose of reducing risks and restoring access to roads on the District that are currently closed due to the fires. Consideration for whether a tree would be within striking distance involves several factors. The [Field Guide for Danger Tree Identification and Response along Forest Roads and Work Sites in Oregon and Washington](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd512960.pdf) (Filip et al. 2016)⁴ indicates that trees may be within the striking distance of a road if the road is within the potential-failure zone of the danger tree. The potential-failure zone is described as 1.5 times the total tree-height of the road plus the slide or roll area. This is because when trees fail, they can come down with substantial force and parts of the tree may slide or roll a considerable distance. When large trees fall, they can also knock down other trees in their path or cause boulders to loosen and roll.

To determine an analysis area of consideration (AOC), the striking distance is being conceptually defined in this environmental assessment as 1.5 to 2 tree-heights. In some cases, where trees are uphill from a road on steep slopes where rolling and sliding risks are greater, the distance may be expanded to include the appropriate slide or roll area (Filip et al. 2016). This expanded area would be entirely dependent on case-by-case and site-specific circumstances. Conversely, where danger trees are located downslope of roads, the distance may be far less than 1.5 tree-height. While cutting danger trees within one tree-height, as described in the 2021 Danger Tree Decision Memo, could mitigate some risks, it would not mitigate enough risk for the Forest Service to reopen all treated roads to public and administrative access. Section 3.0.2 Area of Consideration provides additional information on the development of the AOC for effects analyses.

Roads to Include

² https://www.fs.usda.gov/nfs/11558/www/nepa/116390_FSPLT3_5685201.pdf

³ https://www.fs.usda.gov/nfs/11558/www/nepa/115185_FSPLT3_5658328.pdf

⁴ https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd512960.pdf

Roads within the perimeters of the Riverside, Lionshead, and Bull Complex fires were included in this assessment. An interdisciplinary team of specialists conducted a road-by-road review of the open and closed roads within these areas. The District wanted to ensure that danger tree cutting would not unnecessarily occur along low-use roads, roads that do not have a high management or public need, or that may otherwise be closed in the short-term. The road-by-road review resulted in a site-specific analysis, and ultimately would result in an efficient application of resources and funding spent on both analysis and implementation.

The proposed action for roads includes travel management objectives in addition to identifying danger tree mitigation priorities. The recommendations in the [Mt. Hood Travel Analysis Report](#)⁵ were used to inform the proposed action to close and decommission roads (USDA Forest Service 2015). A description of the proposed action is discussed below and describes whether the road (or portion of the road) should be closed, decommissioned, or danger tree mitigation.

In 2021, the Bull Complex fire occurred. Most of that fire burned within wilderness. Areas outside of wilderness but within the fire perimeter include 13 miles of road. Therefore, the proposed action includes danger tree cutting along those roads and closes others. Road decommissioning is not proposed for roads within the perimeter of the Bull Complex fire.

Oregon Highway 224 is not included in this project. The Oregon Department of Transportation is managing the hazardous conditions along this state highway. Similarly, danger trees adjacent to powerlines are being addressed by the appropriate utility agency, such as Portland General Electric or Bonneville Power Administration through agreements, memorandum of understandings, or special use authorizations. Other danger trees on non-National Forest Service lands are being handled by the Bureau of Land Management, private landowners, or other landowners.

Overall, 377 miles of NFS roads within the burn perimeters in the District have been assessed for this project.

2.0 Project Development and Description

2.1 Purpose and Need for Action

The primary purpose of this project is to evaluate fire-affected roads so that risks to travelers associated with fire-damaged trees can be minimized and access can be restored. There is a need to improve the safety of the public, partners, permittees, Forest Service employees, and Tribes that use and depend on NFS roads for reliable access to their treasured landscapes. There is also a secondary need to implement mitigations to reduce risk in an efficient and responsible way. Therefore, an evaluation of roads is needed to determine where cutting danger trees should be prioritized, and where roads could be closed or decommissioned instead.

The proposal to cut danger trees along fire-affected roads is rooted in our agency's core value of safety. The Riverside, Lionshead, and Bull Complex fires resulted in the temporary closure (by forest order) of 555 miles of roads⁶. Most of the roads within the

⁵ https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd486512.pdf

⁶ The road mileage is derived from GIS and/or the agency's INFRA Database. The road mileage does not include maintenance level 1 roads.

fire perimeters have been temporarily closed to the public under a [Forest Order](#)⁷ (originally issued in September 2020 and updated in December 2021). This project addresses the need to ensure access to the road system by way of cutting identified danger trees that would be determined to be within the striking distance of a road. This proposal also evaluates closing or decommissioning other roads and not cutting danger trees along them unless necessary to safely implement the action. The need for this proposal is two-fold: 1) to minimize risks to travelers on forest roads; and 2) to move closer to the forests minimum road system⁸.

2.2 Proposed Action

2.2.1 Danger Tree Management

The proposed action includes cutting some of the fire-affected trees that are within striking distance of roads. Of the 1,000 miles of road⁶ on the District, 377 miles (including maintenance level 1 and higher) within the fire perimeters were reviewed by the interdisciplinary team, and only 232 miles are proposed for danger tree cutting along them. However, because of the mosaic nature of the burned areas, not every mile proposed for danger tree cutting is likely to have trees cut along it. A summary of the proposed action and associated miles of road is provided in Table 4. Proposed action maps that illustrate elements of the proposed action are available as separate documents and accompany this environmental assessment.

2.2.1.1 Criteria for Danger Tree Selection

For the proposed action, all danger trees within striking distance of the roads would be cut. Also, some dying trees that are expected to become a danger tree in the near future would be cut. For the purposes of this environmental assessment, the definition of a danger tree would be any dead tree (i.e. trees with imminent, likely, and low failure potential) within the striking distance of the road and any dying tree determined to have an imminent or likely failure potential that is within striking distance of the road (Filip et al. 2016 and Hood et al. 2020).

Danger tree identification criterion includes a determination for whether a tree is dead. The proposed action would cut dead and dying trees that are identified as danger trees, and are within striking distance of the road. As stated above, the proposed action includes cutting trees that are classified as dying (i.e., may have green foliage) that are *also* identified as having an imminent or likely failure. This includes live trees that have defects rendering them structurally unstable, as well as those that have some level of predictable delayed mortality due to the fires. Although most of the danger trees within the striking distance of the road would be identified as dead, there are some trees that have green foliage even though they are dead or dying.

The guidelines included in Filip et al. (2016) would be used to determine how much bole or root damage a tree has incurred and whether or not a tree meets the criteria that would

⁷ Forest Orders and current closure information can at: <https://www.fs.usda.gov/alerts/mthood/alerts-notices>.

⁸ The Travel Management Rule (36 CFR part 212) required the Forest Service to conduct a roads analysis for a safe and efficient minimum road system, which included documentation of the Mt. Hood Travel Analysis Report (USDA Forest Service 2015).

qualify it as a danger tree. Additionally, an in-field assessment of dying trees would apply the guidelines in Hood et al. (2020) to determine the probability of mortality within three years. In the absence of other risk factors fire-impacted trees with green foliage that are within striking distance of roads would be retained if the crown scorch or bark char are below the thresholds referenced in Hood et al. (2020).

As outlined in the project design criteria (PDC) section of this assessment (Appendix A), there are some site-specific conditions that would address danger trees differently than described above. For instance, along NFS Road 5400000, for the portion of road which runs immediately adjacent and parallel to Fish Creek, only danger trees that are imminent or likely would be cut (PDC B1.i). The reason in doing so would be to further protect the stream temperature in Fish Creek, which is listed under the Clean Water Act as impaired for temperature. Fish Creek is also designated as a Wild and Scenic River. Therefore, protecting stream temperature in this specific location of the creek would further protect the Wild and Scenic River's outstandingly remarkable values for water quality and fisheries.

2.2.1.2 Striking Distance

The *Field Guide for Danger Tree Identification and Response along Forest Roads and Work Sites in Oregon and Washington* (Filip et al. 2016) indicates that trees may be considered within striking distance if they are within 1.5 times the total tree-height of the road, depending on slope, lean of the tree, and other factors. This is because when trees fail, they can come down with substantial force and parts of the tree may slide or roll a considerable distance. When large trees fall, they can also knock down other trees in their path or cause boulders to roll. In some cases, where trees are uphill from a road on steep slopes where rolling and sliding risks are greater, the distance may be expanded depending on site-specific circumstances. Therefore, the analysis area for the striking distance is conceptually defined in this proposed action as 1.5 to 2 tree-heights plus the roll and slide area depending on slope. Conversely, where danger trees are located downslope of roads, the distance may be considerably less than 1.5 tree-height. Even though the proposed action considers a striking distance of up to two tree-heights, site-specific conditions during field assessment would determine actual striking distance.

2.2.1.3 Operational Efficiency

Due to the magnitude of danger trees along the road system, imminent, likely and low category danger trees would be cut to achieve operational feasibility, management efficiency, and assured access. This does not imply that *all* danger trees would be treated at the "same time". Rather, this suggests that the fire-affected road system being evaluated at one time in this environmental assessment, would allow implementation to occur in a phased manner, over several years. Once danger trees (as described in this assessment) have been cut, there would be no need to conduct additional analysis and additional site assessments to address future fire-affected danger trees along the road. This approach would minimize the need to periodically return for an undetermined number of years to reassess each fire-affected road. The rationale for this methodology is outlined below.

- Fire-damaged trees can change very quickly from appearing to be alive to being obviously dead. And similarly, dead trees can deteriorate very quickly from one that appears stable to one where tops break out in a wind event.

- Further delaying treatment of dead trees could lead to increasingly dangerous conditions for fallers due to increased decay. Tops or large branches could more easily break out and strike a faller. As trees decay, they become increasingly difficult to fall in the desired direction. For the Riverside and Lionshead fires, nearly two years (or more) would have lapsed by the time in-field danger tree assessments and cutting would occur. For the Bull Complex fire, nearly one year (or more) would have lapsed.
- The burned area is vast. There are not sufficient resources and personnel to regularly review all the miles of fire-affected roads so that danger trees can be mitigated on them each year ensuring access on NFS roads.
- There are not sufficient resources available to regularly assemble contracts to complete danger tree mitigation work. Also, the process of assessing danger trees, assembling contracts, and implementing the work on a large landscape would take more than one year, making periodic or annual operations impractical, inefficient, and repetitive. The Forest does not have sufficient funding to pay for the extra cost of multiple, repeat efforts when the work could be completed on each road at one time.
- If not addressed in an operationally efficient manner, work areas would likely be temporarily closed each year so that the work could be safely implemented without endangering the public. Assurance of access on NFS roads would be uncertain and difficult to predict.
- Multiple, repetitive operations would make decisions about the need for fuel cleanup difficult since debris would continue to accumulate. Also, the potential value of danger trees would continue to decline, making contract work to remove remaining danger trees increasingly difficult.

For these reasons, it makes sense to accomplish as much of the danger tree work on any single road as possible at one time, rather than conducting multiple trips over many years to the same road. For example, a road may have danger trees within striking distance with the potential to fail within so many years as defined by Filip et al. It is operationally and economically efficient to cut danger trees that have an out-year failure potential compared to treating only imminent trees, and then returning several times to the same road over future years. As stated above, it would be inefficient and impractical for the District to conduct redundant operations when there is opportunity to gain efficiencies. This supports the concept of implementing projects in an economically viable manner.

Because it is impractical to cut danger trees on all roads identified for danger tree cutting within one year there may be some instances where danger trees are not cut for several years. In these cases, many roads could be reopened prior to danger tree cutting but with signs warning the public of the presence of danger trees. Over the long term, the intent is to minimize risk to road users by cutting down the danger trees alongside all normally open roads, however, due to the likelihood that this effort will take many years to implement, many relatively lower traffic volume roads could be reopened with the danger to users mitigated by posting informative signage. Professional judgement of relative risk will be used to determine where route closures are necessary to mitigate hazards. These determinations shall be made by the District Ranger based on input from local resources and may include (but not be limited to) the following considerations: vegetative burn

severity, presence of basal area mortality, recent tree fall observations, and anticipated traffic volume.

Using signs to mitigate risk, gain operational efficiencies, and improve public access was largely developed based on public comments. During the public scoping period, the District received letters requesting that *all* roads be reopened with signs warning the public of post-fire-related hazards, and that *no* danger trees be cut. While we considered this as an alternative, it was not analyzed in detail (2.6 Alternatives Considered but not Fully Developed). However, based on this concept, the District is incorporating the consideration of mitigating risk by posting informative signs on open routes that the District intends to cut danger trees along but may not have the resources to implement immediately.

2.2.1.4 Guidance Used for Danger Tree Selection

In addition to professional experience and expertise of the interdisciplinary team, the following documents were used to develop the proposed action and would be used to inform the selection of which fire-affected trees to cut.

1. The Pacific Northwest Region has guidelines for identifying danger trees using the *Field Guide for Danger Tree Identification and Response along Forest Roads and Work Sites in Oregon and Washington* (Filip et al. 2016). This guide sets out a step-by-step process for determining if a tree is a danger. This guide, among others, would be used in the field during danger tree assessments. Also, this guide will be used to inform the striking distance of a danger tree on a road (i.e., the potential-failure zone and slide or roll area of a danger tree).
2. *The Post-fire Assessment of Tree Status and Marking Guidelines for Conifers of Oregon and Washington* (Hood et al. 2020) represents recent science and information directly associated with predicting post-fire tree mortality in Oregon and Washington. This guide would be used in the development of silvicultural prescriptions towards determining the likelihood of tree death. This would be directly related to the element of the proposed action that includes cutting dying trees that may have green foliage and have been identified as a danger tree. This guide would be used to determine likelihood of mortality for potentially dying trees.
3. The Pacific Northwest Region has authored a document titled, “Guidance on Danger Tree Assessments and Post-fire Tree Mortality,” which provides guidance on how to address post-fire conditions (USDA Forest Service 2020b). The interdisciplinary team considered a variety of factors when prioritizing which roads should have danger tree cut along them. For example, the interdisciplinary team considered the duration of exposure to danger trees alongside roads, and the values associated with the access a road provides, such as recreation and administrative access.
4. Forest Service Handbook, 7709.59 – Road System Operations and Maintenance Handbook Chapter 40 – Highway Safety Program (February 17, 2011) addresses highways and forest roads. The proposed action includes changing existing open roads (maintenance level 2 roads) to closed status (maintenance level 1) or decommissioning instead of cutting danger trees. This environmental assessment also discusses operational efficiencies (section 2.2.1.3 Operational Efficiency) and

how signs could be used on lower-risk, less time-critical roads allowing access while the road awaits danger tree cutting (see sections 2.2.1.3 Operational Efficiency 2.6.1 Signing All Roads in lieu of Treating Danger Trees). This project is consistent with agency policy for roadside danger tree management because danger trees will be managed (cut) in support of safe use of the transportation system by all road users.

2.2.2 Travel Management

To address the project's secondary purpose of managing an efficient road system, the proposed action includes road closures and decommissioning. Miles of road proposed for closure and decommissioning are listed in Table 1 through Table 4 below. The proposed action includes reversing a previous decision⁹ to decommission NFS Roads 6370000 (4.7 miles), 6380120 (0.76 miles), 6380130 (1.91 miles). Reversing the decision to decommission the roads within the Bull Complex Fire area and maintain them as ML 1 closed status would strategically benefit future wildland firefighting efforts.

Table 1. Proposed action elements by road miles within the Riverside Fire area.

Proposed Action Within Riverside Fire Area	Miles
Danger trees would be cut. There would be no change to the operational maintenance level (ML) ¹⁰ .	168
Close roads changing the operational ML to 1.	24
Decommission roads.	9
Change from an operational ML 1 to ML 2.	3.5
Change from Decommission to ML 1.	0

Table 2. Proposed action elements by road miles within the Lionshead Fire area.

Proposed Action Within Lionshead Fire Area	Miles
Danger trees would be cut. There would be no change to the operational maintenance level (ML).	46
Close roads changing the operational ML to 1.	0.5
Decommission roads.	0
Change from an operational ML 1 to ML 2.	0
Change from Decommission to ML 1.	0

Table 3. Proposed action elements by road miles within the Bull Complex Fire area.

Proposed Action Within Bull Complex Fire Area	Miles
Danger trees would be cut. There would be no change to the operational maintenance level (ML).	18
Close roads changing the operational ML to 1.	7
Decommission roads.	0
Change from an operational ML 1 to ML 2.	0
Change from Decommission to ML 1 (this total is already included above).	7

⁹ Clackamas Road Decommissioning for Habitat Restoration Increment II (2011).

¹⁰ ML 1 – Roads that remain on the transportation system in a closed status. ML 2 – Roads that are maintained for high clearance vehicles. ML 3, 4, 5 – Roads that are maintained for passenger cars with consideration for varying levels of comfort and speed.

Table 4. Summary of proposed action elements by road miles for the planning area.

Proposed Action	Total Miles
Danger trees would be cut. There would be no change to the operational maintenance level (ML).	232
Close roads changing the operational ML to 1.	31.5
Decommission roads.	9
Change from an operational ML 1 to ML 2.	3.5
Change from Decommission to ML 1 (this total is already included in the 31.5 miles changing to ML 1)	7

2.2.2.1 Guidance Used for Travel Management

The Mt. Hood Travel Analysis Report¹¹ (USDA Forest Service, 2015) (TAR), which provides a synthesis of previous transportation planning efforts and recommendations for achieving a minimum road system, was used to inform the proposed action. Based on a review of the TAR, and given the changed conditions created by the fires, the District is proposing to make additional adjustments to the transportation system that would reduce risks to resources, including fire-affected roads. Proposed changes to the transportation system would also reduce maintenance costs and increase the opportunity for an efficient danger tree mitigation response. Section 3.2 Transportation provides additional travel management information.

Roads affected by the fires have various uses and needs. Therefore, the interdisciplinary team considered the site-specific access needs for public and administrative use. The TAR explains that “administrative use of the road system is critical to the operations and management of the Forest” and it provides a list of examples for which administrative use of a road may occur. In addition to the many ways the public uses the road system (mainly for accessing a diversity of recreation sites and exploring nature), roads provide important access for our partners. For example, some roads provide access to communication towers, radio repeaters, weather stations, powerlines, pipelines, hydroelectric facilities, administrative sites, and other facilities operated by special use permits. Some roads provide access to other land ownerships, such as the Bureau of Land Management. Roads are also needed by agency employees to conduct a variety of land management tasks, which currently includes ongoing post-fire work to stabilize slopes, plant trees, and monitor culvert blockages.

2.2.3 Fuel Treatments

Slash that results from implementation could be disposed of in several different ways including but not limited to being piled for later burning, turned into biochar, removed and used to block roads proposed for closure, removed for restoration use, chipped, scattered, or sold.

2.2.4 Other Opportunities

While achieving the primary goals of this project, there are additional opportunities that can be achieved.

¹¹ This report considers the requirements of 36 CFR 212-Travel Management, Subpart A-Administration of the Forest Transportation System.

- **Special Forest Products:** Personal use and commercial firewood gathering opportunities would be available.
- **Restoration:** Many stream enhancement projects require logs that are placed into streams to create pools and provide cover for fish; these are referred to as aquatic restoration logs or fish logs. There is a vast amount of danger trees that are readily accessible and can be cut and stockpiled for this use. In addition to aquatic restoration, cut trees could be used for some infrastructure restoration where appropriate.
- **Commercial sale:** There is an opportunity to provide timber products to local mills. It is estimated that 15-25% of the danger trees would be viable to incorporate into timber sale contracts. The value of the trees would help pay for their removal, road maintenance, and fuel treatments. However, the commercial value of the trees has diminished since the initial burn of the fires and continues to diminish as time goes on.

2.2.5 Project Design Criteria

Project design criteria (PDC) minimize or reduce effects to resources but do not necessarily eliminate all impact. PDC are part of the proposed action and are described in Appendix A. PDC have been incorporated into resource analyses and effects determinations described in section 3.0 Environmental Consequences.

2.3 Management Direction

This environmental assessment is tiered to the Record of Decision and Final Environmental Impact Statement for the Mt. Hood National Forest Land and Resource Management Plan (USDA Forest Service 1990a), as amended (hereafter referred to as the Forest Plan). The Forest Plan guides all natural resource management activities and establishes management standards and guidelines for the national forest. It describes resource management practices, levels of resource production and management, and the availability and suitability of lands for resource management. Additional management direction for the area is also provided in the following notable Forest Plan amendments:

- **The Northwest Forest Plan – Record of Decision for Amendments to Forest Service and Bureau Land Management Planning Documents within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl** (USDA Forest Service and USDI BLM 1994). Consistency with the Northwest Forest Plan is addressed in certain resource topics of section 3.0.
- **Survey and Manage – Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines** (USDA Forest Service et al. 2001). Consistency with Survey and Manage is addressed in sections 3.10 Botany and 3.5 Wildlife.
- **Invasive Plants – Record of Decisions for the Pacific Northwest Invasive Plant Program Preventing and Managing Invasive Plants** (USDA Forest Service 2005) and the **Site-Specific Invasive Plant Treatments for Mt. Hood National Forest and Columbia Gorge Scenic Area in Oregon** (USDA Forest Service 2008).

Standards and guidelines from these amendments are addressed in section 3.10 Botany.

- Wild and Scenic Rivers – Decision Notice and Finding of No Significant Impact for Wild and Scenic River Comprehensive River Management Plan for Nine Wild and Scenic Rivers, 2022 and the Clackamas National Wild and Scenic River and State Scenic Waterway Environmental Assessment and Management Plan, 1993. Actions overlapping designated Wild and Scenic River corridors are discussed in sections 3.3 Recreation, 3.4 Visuals, 3.10 Botany, and 4.2 Wild and Scenic Rivers. There are no actions proposed within the bed or banks of the rivers.

2.3.1. Forest Plan

The Forest Plan provides goals and direction regarding the management of the District's roads to ensure safe access is provided. The following elements from the Forest Plan directly support the purpose and need for this project.

- *Goal 16: Manage Forest recreational access to protect natural resources, provide for public safety, and minimize conflicts among various users of the Forest* (p. Four-3). The project's purpose to mitigate danger trees along roads to restore safe access supports this goal.
- *Goal 17: Provide safe, efficient access for the movement of people and materials involved in the use and management of the Forest. Provide for construction and maintenance of roads, at a level that will minimize environmental damage* (p. Four-3). The project's purpose to mitigate danger trees along roads to restore safe access, while also closing and decommissioning unneeded roads supports this goal.
- *Forestwide Standard-275: All Forest Service management activities shall provide for public safety* (p. Four-78). The project's purpose to mitigate danger trees along roads to restore safe access is consistent with this standard.
- *Forestwide Standard-419: Construction, reconstruction, maintenance and operation of roads shall be based on Road Management Objectives* (p. Four-96). The interdisciplinary team reviewed all the roads within each fire perimeter to assess the need to mitigate danger trees along roads and whether to close or decommission roads instead. These elements of the proposed action were informed by the TAR, as well as known land management, public, and partner access needs.
- *Forestwide Standard-422: All roads shall be maintained to minimize soil erosion and water quality degradation* (p. Four-96). Project design criteria and best management practices have been developed as part of the proposed action to minimize impacts to soil and water from danger tree cutting and/or removal, closing roads, and decommissioning roads.
- *Forestwide Standard-432: Decisions to close or obliterate roads shall be based upon economics, resource objectives, and/or ability to achieve Management Area management direction* (p. Four-96). These elements of the proposal to close or decommission roads were informed by the TAR, as well as known land management, public, and partner access needs.

- *Land Use Allocations:* Roads included in this project are in many Forest Plan land use allocations. Table 5 provides a summary of management areas that are overlapping or adjacent to the AOC. The Forest Plan “A” management areas prohibit regulated timber harvest.

Table 5. Acres of dominant Forest Plan management areas that overlap *or are adjacent* to the AOC.

Management Area	Riverside	Lionshead	Bull Complex	Total
A1 – Wild and Scenic River (Wild) ¹²	403	63	0	466
A13 -Bald Eagle Habitat Area	41	0	0	41
A2 - Wilderness	168	47	4	219
A4 -Special Interest Area	38	563	0	601
A9 -Key Site Riparian Area	0	19	0	19
B1 – Wild and Scenic River (Rec/Scenic)	103	18	22	143
B11 - Deer and Elk Summer Range	0	94	78	172
B12 – Backcountry Lakes	21	59	2	82
B2 – Scenic Viewsheds	802	146	0	948
B3 – Roaded recreation	0	89	0	89
B6 – Special Emphasis Watersheds	662	59	235	956
B8 – Earthflow	1,274	0	0	1,274
C1 – Timber Emphasis	2,307	219	0	2,526

Consistency with the Forest Plan is further addressed in each resource topic in section 3.0 Environmental Consequences and in respective specialist reports.

2.3.2 Northwest Forest Plan

The roads addressed in this project and the associated area of consideration (defined in section 3.0.2 Area of Consideration (AOC)) overlap or weave through the following Northwest Forest Plan land use allocations shown in Table 6.

Table 6. Miles of road (with AOC) that overlap with or weave through the Northwest Forest Plan land use allocations (AW: Administratively Withdrawn, CR: Congressionally Reserved).

Proposed Action Element	LSR	LSR4	AW	CR	Matrix	Riparian Reserve ¹³
Cutting Danger Trees	48	2	11	<1	131	62
Change to ML 1	17	<1	<1	0	18	8
Decommission	<1	0	0	9	<1	2
Change to ML 2	2	0	0	0	0	<1

North Willamette Late Successional Reserve Assessment

27% of the AOC overlaps or weaves through the North Willamette Late Successional Reserve. The North Willamette Late Successional Reserve Assessment (the LSRA)

¹² The 466 acres of “wild” river designation within the AOC is associated with the Clackamas River which has portions designated as scenic and recreational. The 1993 Comprehensive River Management Plan (CRMP) for the Clackamas River removed all lands from “regulated” timber harvest, therefore it was assigned the “A” management area allocation. The CRMP describes that timber harvest may only occur within the corridor if designed to protect or enhance river values and/or ensure visitor safety.

¹³ Riparian Reserve data overlaps AW, CR, LSR, and LSR 4, therefore a portion of these miles is double counted in the respective columns.

provides sideboards for management activities in the Late Successional Reserve to meet late-successional objectives in the Northwest Forest Plan (USDA Forest Service 1998). Regarding roadside danger trees, the Assessment states that trees presenting a safety hazard along roads within the Late Successional Reserve “may be cut” (p. 6-33). The Assessment also provides the following specific recommendations (p. 6-33):

- Felled hazard trees should be left on site to the extent practicable.
- Material should be left in areas where down wood amounts are furthest from desired goals.
- Topping trees should be considered as an alternative to felling.

The proposed action includes a project design criterion (PDC H2) for leaving at least 14 down logs that are greater than nine feet in length and greater than 20 inches in diameter within nesting, roosting and green foraging habitat. Also, there are several project design criteria (PDC H3.a through H3.g) that specifically address protections for the northern spotted owl. The proposed action does not include topping trees that have been identified as a danger tree because there the fire resulted in an abundance of snags; therefore, there is not a need to top trees.

Regarding the project’s need to address travel management-related decisions, the Assessment provides recommendations for road decommissioning and closure (p. 6-32). The Assessment states, “Reduction in road mileage...to reduce habitat fragmentation, barriers to connectivity, and wildlife harassment is recommended for consistency with LSR objectives” (p. 6-32). Since this project aims to further address the need for implementing a minimum road system, the project adheres to the recommendations included in the Assessment.

2.4 No Action Alternative

Consideration for not taking action is included in this environmental assessment. No action would generally result in a continuation of the existing condition and is used for comparison to the proposed action. Taking no action is not reasonably foreseeable because it is not wholly consistent with agency guidance on danger tree management. Also, taking no action would not meet Forest Plan management direction to provide safe roads for public use. In a scenario where the post-fire road system would not be actively managed additional analysis may be necessary to address long term closures.

With no action, roads would not have danger trees cut along them and traditional access to areas on the District that would be opened under the proposed action, may continue to be restricted. There would be no changes to the existing road system, including closures and decommissioning. The potential to contribute towards achieving the minimum road system would not occur.

In certain locations, road infrastructure (e.g., culverts, ditches, and road surface) would not be maintained because conditions would be too unsafe for employees to access. As such, the road would degrade over time. Trees would fall along and across the road making it difficult for vehicle or foot traffic. The current condition of the road system would continue to persist in the absence of other large-scale disturbance such as windthrow events, wildfires, and insect and disease spread. Road closures for roads with known danger trees along them would remain in place until other administrative management actions are determined necessary. Recreation sites (trails, campground,

dispersed sites), hunting areas, traditional and cultural sites, and other locations that are valued by visitors would remain inaccessible due to continued closures or fallen trees.

The District would have less opportunity to retrieve down trees for use in restoration projects (i.e., on-forest aquatic restoration, partner restoration, or recreation and administrative restoration) and visitors would have less opportunity for roadside firewood and special-forest-product gathering, and fewer places for dispersed recreation.

Within the striking distance of the road natural processes for post-fire recovery would continue, much like the remaining post-fire landscape. Fire-stressed trees may live and continue to grow along with grasses and shrubs. Other trees may die and become standing snags and down wood. As trees die, opportunities for insect infestation and disease could increase. Fuels along the road systems would continue to build. In the absence of a safe and accessible road system, there would be less opportunity in the future to initiate fire suppression and fire management actions in some areas.

2.5 Public Involvement

On August 10, 2021, the Clackamas River District Ranger signed a decision memo for removing danger trees along roads that were affected by the Riverside and Lionshead Fires of 2020. In that decision memo, the Ranger decided to begin an analysis for access and travel management to evaluate the need for roads within the fire perimeters that were deferred from that decision. Therefore, the District started the subsequent planning effort and first published this project on the Forest's website in November 2021. The Acting District Ranger verbally shared at meetings in December 2021 and January 2022 with the Clackamas Stewardship Partners, a local collaborative group, that the planning effort for this project was underway.

The Forest publishes a schedule of proposed actions (SOPA) quarterly. This project first appeared in the SOPA on January 1, 2022. Shortly thereafter, an official scoping process to request public input for this project was conducted. A letter requesting comments and describing the proposed project was sent out on January 11, 2022. Scoping comments were due by February 1. However, due to a nation-wide outage with the agency's comment filing system at the end of January, the Acting District Ranger decided to extend the scoping filing period to February 6, 2022. The public was notified of this extension via GovDelivery on January 31, 2022.

This project is subject to the project-level pre-decisional administrative review process (objection process) as identified in 36 CFR 218, Subparts A and B. Eligibility requirements and other aspects of the objection process can be found on the Forest Service website.

2.5.1 Results of Public Involvement

As a result of the scoping effort, over 150 letters were received by individuals and organizations. Many comments were form letters primarily stating that danger tree removal would not make sense on closed or decommissioned roads; striking distance should be based on site-specific circumstances; and a full analysis should be done for Wild and Scenic Rivers, Late Successional Reserves, and designated critical habitat for northern spotted owls. The form letters also expressed the importance of maintaining access to cultural resources and honoring treaty rights. Additionally, these letters expressed support for completing an environmental analysis and support for providing access to the Clackamas River while road work is ongoing.

We received a wide range of unique comments, and several letters came from various organizations including the following: American Forest Resources Council, American Whitewater, Associated Oregon Loggers, Bark, Blue Ribbon Coalition, Cascadia Wildlands, Forest Service Employees for Environmental Ethics, Friends of Living Oregon Waters, Oregon Hunters Association, Oregon Wild, and Portland Books to Prisoners. Overall, some commenters expressed general support for the project while others did not support danger tree work or certain aspects associated with it.

All scoping letters are available on the Forest's website. Key topics raised during scoping and how the District considered specific concerns raised during the scoping period are discussed in more detail in the following sections.

2.5.2 Issues and Concerns

Issues serve to highlight effects or unintended consequences that may occur from the proposed action, giving opportunities during the analysis to reduce adverse effects and compare trade-offs for the responsible official and public to understand. Issues are statements of cause and effect, linking environmental effects to actions, including the proposed action (Forest Service Handbook 1909.15, 12.4). Issues are used to generate additional action alternatives to the proposed action.

Several concerns and recommendations were raised during the scoping period. Most of them were addressed through the project design criteria developed as part of the proposed action. The following information highlights some of the primary concerns raised by the public and how those concerns are addressed in this project. While concerns were expressed from the public, none were identified as issues for the purpose of formulating fully developed alternatives. However, some comments provided suggestions for alternative methods for achieving the purpose and need, which are discussed in the following section.

2.5.2.1 Acceptable Levels of Risk

The District received comments about public safety when visiting the National Forest, and how it is not reasonable to mitigate all risks associated with danger trees. Comments focused on the recommendation that human risk must be balanced with ecological objectives. For example, it was shared that the Forest Service should be more risk tolerant so that more trees could be retained in sensitive areas. Another commenter stated that they believe dead trees are not a danger to public safety. Some commenters requested the Forest Service quantify expected fatalities on NFS roads associated with taking no action compared to the proposed action.

As previously stated in this document, the Forest Service is tasked with providing safe travel-ways for National Forest visitors. Therefore, a desired condition of this project is to ensure safe NFS roads for travelers. Although we recognize it is not possible to mitigate all risks, the agency is still obligated to ensure, to the extent practicable, that known and identified risks are assessed and appropriately mitigated. For this reason, the District plans to follow the agency's guidance outlined in the *Field Guide for Danger Tree Identification and Response along Forest Roads and Work Sites in Washington and Oregon* (Filip et al. 2016) and *Post-fire Assessment of Tree Status and Marking Guidelines for Conifers in Oregon and Washington* (Hood et al. 2020). By utilizing a consistent approach to danger tree and tree mortality identification, the District will be able to lessen, but not eliminate, risks associated with roadside danger trees.

This project aims to *reduce* risks, but some risk will still be inherently present. Any preventable human fatality is one too many. Therefore, as described in the proposed action discussion above, this project proposes to cut dead danger trees that have a low-to-high probability of failure and are within the striking distance of the road. Also, the proposed action would cut dying danger trees that have a high probability of failure within five years (i.e., likely and imminent-failure potential) (Filip et al. 2016, p. 25) that are also within striking distance of the road. The mortality rate of a dying tree would be determined with the use of (Hood et al. 2020) and in coordination with Forest Service entomologist and pathologist.

We also agree with commenters' perspectives on achieving a balanced approach of acceptable levels of risk and ecological restoration. The proposed closures and decommissioning would reduce the amount of danger tree treatment necessary within certain locations of the fire perimeters. Danger trees would only be cut along roads proposed for decommissioning and closure to the extent that is necessary to provide for safe implementation of the action.

Project design criteria (PDC) have been developed as part of the proposed action to lessen the project's ecological impacts, and also aid in restoration. The full list of project design criteria can be found in Appendix A. Some examples of project design criteria that are intended to minimize project impacts include:

- Along NFS Road 5400000 where the road parallels the Fish Creek Wild and Scenic River (PDC B1.i.), only “imminent or likely” trees would be felled. Also, a Section 7 review, per the Wild and Scenic Rivers Act, would be required prior to falling or moving any trees into the bed and banks of the river. The scenery project design criteria (PDC K) define Fish Creek viewer positions.
- Within riparian reserves many project design criteria have been developed to ensure protections of riparian area characteristics and values, including those associated with Endangered Species Act-listed fish habitat. They are described in PDC B, which incorporates elements from the programmatic Routine Actions and Maintenance Biological Opinion (RAMBO) from the National Marine Fisheries Service and US Fish and Wildlife Service (2018). Several other project design criteria include consideration for riparian reserve protections such as: C5 and C10 for ground-based operations; D1 and D2 for the use or reuse of landings; E2 for managing activity generated waste material resulting from road work; and G2 and G7 which address fuels management within riparian reserves. In addition, PDC L were developed to include aquatic protections through the incorporation of the programmatic Aquatic Restoration Biological Opinion (ARBO II) from the National Marine Fisheries Service and US Fish and Wildlife Service (2013). Also, the resource protections from the Army Corps of Engineers Regional General Permit are incorporated.
- Design criteria have been included regarding the northern spotted owl in PDC H3.a-g. This section, for example, includes operational timing restrictions as well as cutting only the “imminent or likely” failure potential trees and leaving them on the ground within known viable nest patch areas. Also, the proposed action includes coordination with a wildlife biologist during project implementation if northern spotted owl concerns are identified in the field.

Although defining acceptable levels of risk is not included in this analysis, the District considered three alternatives based on public comments that treat fewer danger trees. In one alternative, signs would be used to warn the public of hazards and, therefore, danger trees would not be treated. In another alternative, only trees with imminent failure potential on high priority roads are considered. Lastly, the District considered an alternative in which the striking distance is reduced, therefore, resulting in fewer danger trees being treated. Please see the following section for descriptions of how these alternatives were considered.

2.5.2.2 Travel Analysis, including Not Treating Low Use Roads

We received comments encouraging the consideration of the Forest's TAR. Many comments suggested that danger trees should not be cut along 'not likely needed' roads, as well as lower use roads. The interdisciplinary team conducted a road-by-road review to ensure danger tree cutting would only occur along road systems that were necessary for the action. The result of that review was the identification of 9 miles of roads for decommissioning, and 27 miles of roads for closure. Danger tree cutting would not occur on those roads in the same way it would occur along roads proposed to keep open for general public or administrative use. Danger trees would only be cut along roads proposed for closure and decommissioning to the extent necessary to safely implement the action. Appendix B lists the actions associated with each road within the fire perimeters and includes information regarding the TAR recommendations for roads that are 'likely needed' or 'likely not needed.'

We considered not treating danger trees on *all* lower use roads. However, in our review of the transportation system, we identified several roads and segments of roads that are identified as objective maintenance level 1 that would be treated for danger trees (see Appendix B and section 3.0.2 Area of Consideration). The table in Appendix B displays a road-by-road description of which roads would have danger trees cut along them, and which roads would have travel management changes associated with them under the proposed action. Roads within the fire burn perimeters that would be maintained (i.e., maintenance level 2 and higher) were determined to be important for several reasons. Primarily those roads are frequently used by the public to access special areas, and/or they are used by partners to access infrastructure, and/or they are used by the Forest Service to access administrative sites or conduct land management work.

We also considered how to best address danger trees along roads identified for closure or decommissioning from previous projects, but have not yet been implemented. The proposed action does not focus on treating danger trees on these roads, however, there may be some instances where danger trees may need to be addressed to safely implement effective road closures and decommissioning. In either scenario, felled trees would be left on site except where fuel loading or insect infestation would be a concern. Two scenarios are provided below as examples but are not intended to limit the possibility around needs associated with danger tree removal for roads proposed to be closed or decommissioned.

Scenario 1: Some road closures or decommissioning requires very little action, primarily entrance management. In this instance, danger trees would not likely be felled along the length of the road because there would be no compelling resource concern to address for implementing the closure. Entrance management may be the objective, and as such, only the danger trees within striking distance of the road (and/or operators) around the

entrance of the road would be cut (following Occupational Safety and Health Administration regulations to ensure a safe work environment under contract).

Scenario 2: Some road closures or decommissioning would require a considerable amount of work to install water bars, pull culverts, or re-contour for drainage. In this instance only the danger trees within striking distance of the road (and/or operators) would be cut (following Occupational Safety and Health Administration regulations to ensure a safe work environment under contract). It is likely that more danger trees would be cut along the road compared to Scenario 1 due to the increased amount of work necessary to implement the closure or decommissioning.

2.5.2.3 Impacts to Local Communities

Commenters expressed concern and disappointment regarding the economic impacts resulting from the long-term closure of Highway 224. It was suggested that we consider allowing river access along Highway 224 even if this project has not yet been completed. As the District completes restoration at recreation sites, they would be reopened. If hazards (i.e., trees or hazardous materials or conditions) exist at a recreation site, or if restoration work has not been completed to a level that would sustain use, then the site would not be reopened. The District has been implementing recreation restoration actions since a [decision memo](#) was signed in 2021, which authorized the repair of recreation site facilities and trail infrastructure destroyed or affected by the Riverside and Lionshead fires. There are many recreation sites to be repaired, and the District is aware of the desires and needs of the local community and the local whitewater community to prioritize river-related recreation sites in the Clackamas River corridor first. The District intends to re-open roads and developed recreation sites as soon as restoration is completed, and safe access can be provided.

2.5.2.4 Specific Roads

We received several comments which addressed specific roads. Our consideration of these roads is discussed below.

- NFS Roads 4620130, 4620170, and 4621000 at the junction with 4621150: Comments stated that the closures on these roads have been breached. Comments requested this road be closed again to prevent unauthorized access. The District appreciates being notified of breached road closures. Although there is no need to further analyze existing closures in this process, the information has been shared with our engineering staff to address the need to strengthen barriers and closure methods in these locations.
- NFS Road 4621000: There is concern that a French drain on this road should be replaced with a larger culvert. Although there is no need to analyze replacing the drainage at this location, the information has been shared with our aquatics and engineering staff to address any needs to improve the drainage at this location. Drainage improvements can be accomplished through the implementation of the Forest-wide Aquatic Organism Passage Restoration Decision Memo (2018).
- NFS Road 5412000: A commenter suggested redundant access to the unnamed quarry along NFS Road 5412000 should be minimized so that it is only accessible from NFS Road 5410000 or NFS Road 5411000. The suggestion to close or decommission at least half of the existing and open NFS Road 5412000 was so that open road density could be reduced, and road maintenance efficiency

could be enhanced. After a review of this road recommendation with the interdisciplinary team it was decided that the maintenance level to the road would not be changed at this time. The redundant access is necessary to support future timber management objectives as well as assured access to the Whalehead communication infrastructure.

- Roads that access trails and other areas: Comments were received concerning access to existing trails and other areas on the Forest. Specifically, we received comments about access to the west end of the Rimrock Trail (#704), and access to the Cripple Creek (#703) and Cache Meadow (#702) trail systems. The proposed closure of NFS Road 4635146 would not affect access to the west end of the Rimrock Trail. The proposed action does not include the closure or decommissioning of NFS Road 4635140, which is a primary route for access to these trails.
- The District also received questions about NFS Road 4672160, which is not included in or connected to a fire perimeter, and therefore not included in the proposed action.
- Comments were received regarding the difficulty to interpret the proposed actions for NFS Road 5400000 as illustrated on the scoping map. The updated map and tables accompanying this document are expected to clarify actions related to this road.
- An inquiry regarding management responsibility for NFS Road 4545130 was received. NFS Road 4545130 is a Forest Service-managed road and is proposed to be closed as part of the project. The road that accesses the LaDee Flats area (NFS Road 4610000) was recently reopened. The Riverside Fire closure order was updated in December 2021 to reflect this change. Lastly, NFS Road 4610000 is still included in the proposed action description for this project as a road to keep open for access.

2.5.2.5 Avoid Cutting Alive and Green Trees and Consider Topping Danger Trees

Commenters requested the agency avoid cutting any alive and green trees. Commenters shared that trees presumed to be dying should be considered as live until they are dead so that ecological benefits of those trees are not lost. The proposed action includes cutting trees with green foliage that have an imminent and likely probability for failure potential (Filip et al. 2016). In addition, a species dependent probability of mortality would be determined for fire-affected trees (Hood et al. 2020). If the field assessment results in a determination of the mortality probability threshold, and would be within striking distance, then it would be cut. However, the proposed action would not cut any dying trees that have a low probability for potential failure (Filip et al. 2016). The proposed action would also not cut any danger trees on roads proposed for closure and decommissioning, to the extent necessary for safe implementation. Lastly, the proposed action would not treat any dead or dying trees that have a low probability of failure potential along NFS Road 5400000, where it runs parallel to Fish Creek.

Similarly, commenters also requested that we consider topping danger trees rather than felling them. The proposed action does not include topping trees that have been identified as a danger tree because there the fire resulted in an abundance of snags; therefore, there is not a need to top trees

2.5.2.6 Northern Spotted Owl

Commenters suggested that the project focus on maintaining habitat elements that support the northern spotted owl and their prey, such as large trees and snags. Concern was also expressed that this project would increase habitat fragmentation. Northern spotted owls use of habitat is not limited to linear features such as roadsides. The proposed action would occur along existing linear corridors and does not include the establishment of new linear features. Only trees meeting the project criteria (2.2 Proposed Action) would be removed. That means that trees not identified as danger trees within striking distance of the road would remain. Thus, due to the design of the proposed action, habitat fragmentation would not be further degraded compared to the existing condition.

Post-fire forage habitat is edge habitat found alongside the outer edges of burned areas that are adjacent to suitable northern spotted owl habitat. It is also considered a transitory habitat for an undetermined amount of time. A discussion of the development of post-fire forage habitat is included in the wildlife report. Because the proposed action would treat danger trees within post-fire forage habitat, consultation with US Fish and Wildlife Service would result in a *likely to adversely affect* determination. However, project design criteria have been developed to minimize impacts to the northern spotted owl. PDC are included in the proposed action that would ensure snags and down wood would be available for the northern spotted owl and prey species.

2.5.2.7 Stabilize Watersheds

Some comments expressed concern about the project's impacts to watersheds. Commentors suggested the proposed action should limit erosion, not remove felled danger trees from riparian reserves, use cut trees for aquatic restoration, and lastly that the project must meet Aquatic Conservation Strategy and Watershed Analyses recommendations. Effects analysis for these elements of concern are included in the sections 3.6 Hydrology and 3.8 Fisheries of this environmental assessment, as well as the respected resource reports.

2.5.2.8 Contracts for Treating Danger Trees

Some members of the public expressed concern about using a commercial sale for implementing this project. They shared that economic conflicts of interest could lead to ecologically important large trees being removed. Others expressed disappointment in the likely use of taxpayer dollars to fund this work. They shared that costs to the public could have been offset by the timber's value. We appreciate both of these perspectives and recognize that implementation for this project would be accomplished using a variety of methods. For example, some danger trees may be addressed through traditional timber sale contracts. The agency's contracting officers would work closely with purchasers to ensure project design features and best management practices are adhered to. However, due to the deteriorated value of timber, we anticipate a large amount of the work would be accomplished using service contracts, which may primarily be funded by disaster relief funding. In addition to these types of contracts, cutting and removal of danger trees may occur through contracts for restoration projects. Lastly, the removal of felled material may also occur through the use of commercial and personal-use firewood permits.

2.6 Alternatives Considered but not Fully Developed

Public comments received in response to scoping provided suggestions for alternative methods for achieving the purpose and need. There is some redundancy with the concerns discussed above, however, the following describes these in further detail.

2.6.1 Signing All Roads in lieu of Treating Danger Trees

Several commenters recommended signing roads with a warning to the public about potential danger tree risks. Commenters shared that signage on roads could allow people to evaluate the risks of travelling on the road for themselves. In this alternative, no danger trees would be cut and all roads that were previously open to the public prior to the fires would again be open for public access. The District considered this as an alternative but did not analyze in detail for the following reasons:

- 1) As previously stated, the Forest Service is committed to minimizing risks; providing for safe travel ways on open roads. The fires resulted in a large number of fire-damaged trees alongside roads, which pose an atypical number of potential hazards to travelers. Thus, the proposed action aims to reduce risks associated with roadside danger trees, whereas installing signs to warn drivers of potential risks would not lessen this risk. Rather, it could shift liability, but signs would not actually lessen risks.
- 2) With or without signs, failing trees could fall across roadways and prevent access. The agency has limited resources and staff to respond to the frequent road clearing that would be required if tree failure potential along the fire-affected roads is not addressed proactively. Fallen trees on roads would not be addressed in a timely manner, would accumulate over time, and could impact access to the forest by all road users including emergency responders.
- 3) Signs would warn drivers of potential hazards; however, danger trees would still fall on roads, which could result in Forest users being trapped behind fallen trees. The agency has limited resources and staff to respond to these types of incidents.
- 4) Signs are often vandalized and/or removed. Therefore, wherever this happens, it is likely that some road users would be unaware of potential hazards, and unknowingly assume safe road conditions.

Signing roads only, rather than cutting danger trees, would not fully meet the project's stated purpose to reduce risks associated with danger trees alongside roads. Additionally, the need to restore access to the Forest would not be met as danger trees continue to age, decay, and fall across the many miles of fire impacted roads. Therefore, this alternative was not considered further.

The District has incorporated the use of signs where appropriate to mitigate risk, ensure operational efficiencies, and to meet public demand for access to more roads. Information about the use of signs is described in section 2.2.1.3 Operational Efficiency.

2.6.2 Only Cut Imminent Danger Trees on High Priority Roads

The District considered an alternative that would only treat danger trees identified with an imminent failure potential, meaning that trees with a high probability of failure within one year would be mitigated (Filip et al. p. 25). In this alternative, imminent-failure

potential trees would only be addressed on “high priority” roads which would include maintenance level 3, 4, and 5 NFS Roads: 4600000, 4610000, 4631000, 4631011, 4631140, 4220173, 5400000, and 5700000. This alternative would not address the majority of open (maintenance level 2) roads within the fire perimeters and was not considered in detail for the following reasons:

- 1) This does not address other important primary and arterial roads within the fire perimeters. These other roads would not classify as “high priority” roads even though they access trailheads, dispersed recreation sites, land and resource management areas and projects, traditional and cultural places, and other locations important to local communities. One commentor suggested that danger trees should not be removed from ML 1 and ML 2 roads. The majority of the road miles where danger tree cutting is proposed are ML 2 roads¹⁴. The proposed action does not include danger tree cutting on ML 1 roads that are already closed or planned for closure except to safely implement the closure.
- 2) Cutting danger trees only on “high priority” roads as described above would not result in a level access similar to the pre-fire condition. Maintaining closures and/or the suggested “enter at your own risk” signs for all the other fire-affected roads could result in a number of forest visitor use issues that include congestion at developed, day-use, and dispersed recreation sites, and along the road due to improper road shoulder parking. Signing roads *instead* of cutting danger trees along them would not mitigate the known hazards along NFS roads to the extent reasonable. Fire-affected trees would eventually fall along the road systems or onto the road blocking agency staff, firefighters, and other forest travelers from access, or could result in trapping travelers behind the felled trees. Being trapped from a timely exit could result in exposure risks to travelers and possibly increased search and rescue calls. See section 2.6.1 Signing All Roads in lieu of Treating Danger Trees and 2.2.1.3 Operational Efficiency for additional information about signing roads.
- 3) In the long term and considering the overall road-maintenance needs for our existing road system, only cutting danger trees along maintenance level 3, 4 and 5 NFS roads would create operational inefficiencies for managing the rest of the fire affected road system. Employees and contractors would not be able to have an assurance of timely necessary access to road-related infrastructure needs on other roads such as ditch line repairs, culvert repairs or drainage replacements, bridge inspections and repairs, surfacing inspections and other road maintenance needs.
- 4) Cutting only imminent danger trees along high priority roads was not considered further because it would not fully address the project’s purpose and need for efficiently managing risks associated with fire-affected danger trees. In addition, cutting only the imminent trees would be operationally inefficient leaving the likely and low category of danger trees along roads resulting in a lack of assurance of access to and from places on the District.

¹⁴ There are 213 miles of ML 2 where danger tree cutting is proposed. 258 miles of ML 2 roads have been reviewed by the IDT.

2.6.3 Striking Distance

Some members of the public suggested that danger trees only be addressed that are within 100 feet of the road. It was suggested that trees more than 100 feet from the road have a low chance of falling on the road. Commenters recommended this approach to achieve more environmental values by treating a smaller area. The District considered an alternative that exclusively treated danger trees within 100 feet of the road; however, this alternative was eliminated because it does not take into consideration other factors, such as slope, topography, lean, and other nearby hazards. Limiting danger tree cutting to a 100-foot distance from the road would not result in restoring access along most of the fire-affected roads on the district due to the variation in slope percentage uphill and downhill from roads and the variation in tree height. The proposed striking distance would account for the variation in tree height and slope along roads. Similarly, there are some pieces of fire-affected roads where the determined striking distance may be less than 100 feet from the road based on the site-specific conditions on the ground (i.e., slope percent accompanied short trees).

2.6.4 Do Not Close or Decommission Roads

Some members of the public stated that roads should not be closed or decommissioned as a method for mitigating public risk. They shared that removal of adequate access to NFS lands would compromise the agency's ability to manage the District, including treating hazardous fuels and wildfire suppression. Also, it was expressed that without an adequate road system, the Forest Service would be unable to offer and sell timber products to the local industry in an economical manner. Roads included to be decommissioned or closed under the proposed action would not impact the Forest's ability to offer and sell timber. Consideration for firefighting and future vegetation management objectives was included in the development of the proposed action to close or decommission roads.

3.0 Environmental Consequences

This section summarizes the physical, biological, social and economic environments of the affected area and the effects to those environments due to implementation of the proposed action. The following resource sections provide a summary of the existing condition, effects determination, and the project's consistency with management direction pertaining to the resource subject.

3.0.1 Incorporation by Reference

The following list of resource analyses and reports are incorporated by reference. Each report documents the proposed action's effects to the resource and consistency with the Forest Plan as it relates to the resource. Resource analyses are documented in the respective reports and are available in the project file. A list of references used to support resource analysis and effects determinations are included in the respective reports and project files.

- **Silviculture Report:** This report documents the existing conditions of the vegetative burn severity and mortality through the Area of Consideration (AOC) as a result of the fires. Information about danger tree identification is included in the report.

- **Transportation Report:** The report discloses the project's impacts to the transportation system (i.e., infrastructure and transportation system).
- **Recreation Report:** The report discloses the effects of the project on recreation resources and the recreation opportunity spectrum as defined in the Forest Plan.
- **Visuals Report:** This report includes a discussion of the existing condition of the post-fire landscape. Impacts to scenic values from the proposed action are disclosed in this report. Consistency with the Visual Quality Objectives (VQOs) as described in the Forest Plan is disclosed.
- **Wildlife Report:** The biological evaluation discloses the project's effects on Threatened and Endangered wildlife species, and their habitat as well as Region 6 Regional Forester's Special Status Sensitive Species and Survey and Manage species.
- **Hydrologic Resources Report:** provides the analysis of the existing conditions for watershed resources, as well as a discussion of effects of the project on these resources. The report addresses water quality, water quantity, and sediment impacts anticipated as a result of the proposed action and documents the project's consistency with the Clean Water Act.
- **Soil Report:** This report documents the analysis of the project's impacts to soil productivity and slope stability, including an assessment of detrimental soil conditions.
- **Fisheries/Aquatics Report:** The biological evaluation discloses the project's effects on Threatened and Endangered fish species, and their habitat as well as Region 6 Regional Forester's Special Status Sensitive Species. The report also discloses the project's consistency with riparian reserve and Aquatic Conservation Strategy Objectives required under the Northwest Forest Plan.
- **Cultural Resources Report:** This report documents the project's effects to archaeological and historical resources.
- **Botany and Invasives Report:** The botanical resources and invasives report are separate. The Botanical resources report documents the project's effects on Threatened and Endangered botanical species, and habitat as well as Region 6 Regional Forester's Special Status Sensitive species and Survey and Manage species. The invasives report discloses the risks of introduction and spread of invasive and non-native species.
- **Fuels and Fire Hazard Report:** This report discloses the project's effects to fuel loading and discusses associated fire hazards.
- **Economic Report:** discloses a conceptual review of the project's economic impact to local communities. The analysis includes considerations for timber value and volume, as well as the project's potential impact to forest visitors and the communities they come from and small businesses they support.
- **Climate Change Report:** This report discusses the project's impacts to climate change vulnerabilities and documents any project-related adaptations made to minimize impacts to climate change vulnerabilities.

3.0.2 Area of Consideration

Resource analyses used a GIS-derived Area of Consideration (AOC) to inform effects analysis. The AOC generally illustrates the variable striking distance along the road based on stand composition and site potential tree height. It was developed based on the following elements:

- Excludes roads proposed to be decommissioned or proposed to be changed to ML 1 (closed),
- Excludes roads that are already ML 1 (already closed) with the exception of the following current status ML 1 roads that are proposed to change to ML 2. These roads could have danger trees cut along them for administrative access needs. Additional information about these roads is provided in Appendix B. It is possible that some danger trees were removed already along portions of these roads (3.5 miles) during fire-related emergency and some recovery operations:
 - 1) 4500340.1: 1.07 miles; proposed action includes changing to ML 2.
 - This road accesses C800 Memaloose communication infrastructure, primary maintenance needs are completed through a special use authorization. The proposed action includes changing the operational maintenance level to 2. The proposed action includes cutting danger trees along this road if not already completed under a special use authorization.
 - 2) 4500350.1: 0.66 miles; proposed action includes changing to ML 2.
 - This road accesses C800 Memaloose communication infrastructure, primary maintenance needs are completed through a special use authorization. The proposed action includes changing the operational maintenance level to 2. The proposed action includes cutting danger trees along this road if not already completed under a special use authorization.
 - 3) 4600028: 0.21 miles; proposed action includes changing to ML 2.
 - This road provides access to water treatment infrastructure at Timber Lake Job Corps.
 - 4) 4600030: 0.83 miles; proposed action includes changing to ML 2.
 - This road provides access within Timber Lake Job Corps.
 - 5) 4600032: 0.20 miles; proposed action includes changing to ML 2.
 - This road provides access to water line infrastructure within Timber Lake Job Corps.
 - 6) 4630012: 0.49 miles; proposed action includes changing to ML 2.
 - This road accesses PGE infrastructure, primary maintenance needs are completed through a special use authorization. The proposed action includes cutting danger trees along the road if not already completed under a special use authorization.
- Excludes non-NFS lands,
- Bound to the extent of the perimeter of each fire area within the Forest,
- Extends the length of roads that weave in and out of burned and unburned pockets within the outer perimeter,
- Based on pre-fire stand composition site potential tree height,
- Variable between a 1.5 to 2 tree-height distance from a road proposed to be kept open. However, some areas extend farther from the road when the uphill slope is 30 percent or greater.
- Measured from the linear road layer in GIS. In the field, the measurement would be from the outside edge of the road prism (i.e., the top of the cut bank or bottom of the fill slope).

The AOC is not intended to serve as a definitive treatment or traditional “unit boundary” as typically seen in previous vegetation management environmental assessments.

Striking distance for this project is variable and is based on a site-specific determination made in the field during project implementation. There are 7,600 acres within the AOC among the three fire areas. The development of the AOC in GIS did not account for the mosaic burn pattern across the landscape. The Rapid Assessment of Vegetation (RAVG) data that illustrates the severity of burn as measured by the percentage of trees killed (i.e., basal area mortality) is based on a point in time. We know latent mortality occurs after the initial burn of the fires. RAVG data can be overlayed with the AOC to inform whether or not some areas may have more danger trees than others. While the AOC appears continuous in some areas, cutting danger trees would not be continuous along both sides of a road. Danger tree cutting may not occur at all in some areas of the AOC, while it may be heavier in others.

3.0.3 Existing Condition

Effects of the proposed action were determined based on the existing condition within the planning area (the post-fire landscape). The proposed action effects analyses do not include an analyses of the effects of fire on the landscape. The existing condition of the area is a post-fire environment with mosaic burn pattern where some areas burned extremely intense leaving only ash across the ground and toothpick-like remnants of standing trees, while other areas burned to a much lesser degree of intensity, where trees and brush remained and continue to thrive. An existing condition discussion is present in each resource report which is incorporated by reference (see section 3.0.1 Incorporation by Reference). In this environmental assessment, a summary of the existing condition is only be provided for context to better understand the effects determinations. See section 2.4 No Action Alternative for a description of the consideration for no action. No action was considered but not fully analyzed.

3.1 Silviculture

3.1.1 Existing Condition

Several vegetation structures throughout the planning area were affected by the fires. The estimated basal area loss from each vegetation structure is summarized in Table 7. The table serves to provide context for burn severity within the AOC. Half of the total AOC burned in the moderate-to-high severity category. Moderate-to-high severity burned areas generally resulted in a greater than 25 percent mortality. Further, snag volume estimates provided in Table 8 illustrate a higher volume of snags per acre where mortality increases. The snag volume estimates shown in Table 8 represent snags created by the fires. It does not consider snags existing prior to the fires.

Table 7. Percentage of vegetation structure by basal area (BA) mortality loss within the AOC.

Vegetation Structure	Acres within the AOC	0% BA loss	0 to 0% BA loss	10 to 25% BA loss	25 to 50% BA loss	50 to 75% BA loss	75 to 90% BA loss	90 to 100% BA loss	25 to 100% BA loss
Young Plantation	319	3	38	7	11	9	5	28	53
Older Plantation	2,088	3	47	5	10	14	7	13	44
Mid-seral Fire	1,258	2	30	5	10	14	10	28	72
Late	3,703	4	41	6	12	14	7	17	50
Other	252	3	28	7	16	27	14	5	62

Table 8. Estimated snag volume within the AOC for the Riverside and Lionshead fire areas¹⁵.

Basal Area Mortality	Acres	Range of Tons per Acre of Snags
0 – 25%	3,440	Up to 52
25 – 50%	826	46 to 92
50 – 75%	1,058	103 to 153
75 – 100%	1,912	137 to 182

3.1.2 Effects Summary and No Action Consideration

The proposed action would have a minor effect on the vegetation resource. The removal of danger trees along roads is not a silvicultural action and does not change the amount or quantity of available timber on the landscape to meet the timber management objectives of the Forest Plan. Further, closing and decommissioning roads, while limiting access to certain areas of the forest, would not negatively impact silviculture resource because the roads proposed for closure and decommissioning were determined not needed in the foreseeable future for vegetation management objectives.

Taking no action could result in the inability to accomplish future beneficial silvicultural actions such as post-fire reforestation, stand improvement, or future commercial and pre-commercial thinning projects. Lightly to moderately burned portions of the AOC could benefit the remaining standing trees by providing them additional growing space and decreased competition resulting in increased vigor and growth rates. However, dying, standing dead, or recently dead and fallen trees that are not hauled away immediately could provide sources for bark beetles to brood and attack surrounding live trees, potentially increasing tree mortality within a stand.

3.1.3 Direct, Indirect, and Cumulative Effects

3.1.3.1 Direct

Areas with a moderate-to-high degree of mortality (including both immediate and latent mortality) would likely convert to stand initiation/early seral structural conditions along roads. The combined area of all vegetation structures experiencing moderate to high burn severity which could convert to a stand initiation stage is 0.9% of the total District's land base.

As snags fall, they become part of the down woody debris (i.e., fuel) accumulation on the forest floor. This accumulation would be reduced from within the AOC as a result of the proposed action (Table 9) because it includes the cutting and removal (following PDC) of danger trees. The removal of danger trees would lower the volume of fuels within the AOC.

Table 9. Estimated average change of fuel accumulation within the AOC for trees greater than or equal to 3-inches diameter at breast height (DBH).

Basal Area Mortality	Acres	Average Snag Tons per Acre with No Action	Average Snag Tons per Acre Proposed Action	Difference
0 – 25%	3,440	Up to 52	Up to 8	44
25 – 50%	826	46 to 92	7 to 15	39 to 77

¹⁵ The Bull Complex is not included in this table because the LiDAR data used to calculate the estimates was not available for the Bull Complex fire area.

Basal Area Mortality	Acres	Average Snag Tons per Acre with No Action	Average Snag Tons per Acre Proposed Action	Difference
50 – 75%	1,058	103 to 154	16 to 23	87 to 131
75 – 100%	1,912	137 to 182	26 to 35	111 to 147

The estimates include fuels that are 3-inches in diameter and greater because they have the greatest risk for carrying fire if ignited when dry. This size class of fuels is also referred to as 1,000-hour fuels indicating the length of time it takes for these fuels to respond to weather changes. The data provided in Table 9 likely overestimate the total tons per acre of this size class because tree taper is not accounted for. Trees are not perfect cylinders. The diameter of the tree tapers as you move towards the top of the crown. Nonetheless, the comparison in Table 9 shows how danger tree removal would lessen future down woody debris levels within the AOC.

The RAVG data does not account for latent mortality. Deterioration of some trees from initial fire effects could result in mortality occurring within the first two years because of the amount of crown consumption, damage to the cambium layer, and/or damage to tree roots. Subsequent decay and impacts from insects and disease would increase mortality in some areas. With the probability of added mortality that is not measured by RAVG, there would be an expected additional snag volume and subsequent increase in down woody debris levels in some areas over time.

The effects to vegetation resources are minor as a result of the proposed action.

3.1.3.2 Indirect

Indirectly piling material and leaving it for long periods of time could result in beetle infestation or outbreak. Slash that is generated through operations would be decked or piled for disposal at locations to be specified, which may include rock quarries or landings along roads closer to where danger tree operations occur. When decking trees in close proximity to surviving trees, insect infestation and spread could occur. Beetles such as Douglas-fir beetle in the case of Douglas-fir logs or Ips spp. in pine-related slash and smaller-diameter logs could attack remaining alive trees within the AOC that were not identified as danger trees. If an alive tree was weak enough, it could succumb to mortality from these attacks. PDC are included to avoid insect infestation. Coordination of near-term planned silviculture activities (such as reforestation) would be needed during project implementation to ensure the closure and decommissioning of roads does not conflict with the ability to access areas for active planting.

3.1.3.3 Cumulative

There are 80 acres of planned timber sale units from the Goat Mountain Thin EA and the Grove Thin EA that overlap the AOC. Overlapping areas generally occur where mortality is 0-25 percent. The prescriptions for tree removal for Goat Mountain Thin and Grove Thin EA treatment units likely designate leaving trees that could have potential to become danger trees (depending on time of implementation) under this project. It is possible that overlapping areas would retain fewer trees resulting in small openings. However, given the degree of expected mortality in these areas, it is likely that few danger trees would need to be cut. Because of the minimal area of overlap and the associated PDC for the projects, a cumulative effect to vegetative resources would be minor.

3.1.4 Forest Plan Consistency

The proposed action is consistent with the Forest Plan (FW-309). Many forest plan standards related to silviculture are not applicable to this project. The purpose and need of the project are related to minimizing risk on NFS roads through the removal of roadside danger trees or the closing and decommissioning roads. There are no silviculture objectives (i.e., culturing or tending trees) in the proposed action, and cutting danger trees is not silvicultural in nature. The proposed action does not include the application of even-age cutting, uneven-age cutting, clearcutting, group selection cutting, seed tree selection, or shelterwood harvest methods. For these reasons, implementation of the proposed action does not result in “created openings” as defined in the Forest Plan (Glossary – 5).

3.2 Transportation

3.2.1 Existing Condition

The existing condition of the road system within the planning area varies dependent on burn severity. Within the fire perimeters, some areas were less affected by the fires and the roads remain in a pre-fire condition. These roads were generally in a fair, moderate, or poor shape prior to the fires. Many used for passenger vehicles had deteriorated resulting in difficult driving conditions. Vegetative growth along roadsides had begun to encroach upon the road prism limiting sight distances around horizontal curves. Stream crossings and drainage culverts were found to be undersized and frequently plugged. Ditch lines and drainage structures along the roadways were sometimes filled with slough and slide material or blocked by trees which have grown in excess of four inches in diameter, causing these drainage features to be inadequate and fail. Standing water in ditches would either flow over the roadway, causing surface erosion, or begin to percolate through the road base and subgrade causing potholes, sinkholes, and road slumps.

Other areas along roads burned at a high severity creating some new issues for the existing transportation system. Now, many roads within the planning area have dead and dying trees standing within striking distance of the roadway. Vegetation that was previously encroaching the roadway, burned resulting in exposed soils there is an increased risk of slides and road failures. Road conditions prior to the fires would be exacerbated where burn severity was high.

3.2.2 Effects Summary

The proposed action would result in increased effectiveness of the Forest’s transportation system while minimizing impacts to other resources. There would be no substantive cumulative effects to the transportation system because projects that use roads also provide maintenance and repair commensurate with their use.

Taking no action would mean that no road maintenance would occur in the short term due to the loss of access from danger trees present. Current road failures, drainage failures, and erosion control problems that existed in the road system prior to the fires would continue to persist. The inability to perform road maintenance and reconstruction would result in negative impacts to the roadway and its functionality and impacts on other resources. Road surface, road subgrade, and road base failures present physical hazards to drivers, reduce a driver’s ability to maintain positive control of a vehicle, and

increase the potential for the development of erosion hazards on the road. Poorly functioning drainage systems increase sedimentation in streams and waterways due to their failure to properly mitigate erosion. In addition, there would not be further attainment towards a minimum road system.

3.2.3 Direct, Indirect, Cumulative Effects

While heavy haul of materials and heavy equipment operation on the roadway is the most impactful action regularly applied to the transportation system, this action would be accompanied by increased frequency of road maintenance to accommodate safe haul. Many roads used for haul¹⁶ would receive some type of reconstruction work that is considered beyond the definition of maintenance. Collector and primary haul routes would likely receive more road repairs and constructive improvement work than some others to accommodate heavy use. The project may be costly to implement Due to the nature of cutting and removing identified danger trees and the high cost of road maintenance and reconstruction necessary for access.

In addition to operational impacts to roads, the proposed action includes changes to road status. These changes are informed by the recommendations from the TAR and serve to move toward a minimum road system. Table 10 provides a list of roads where the proposed action deviates from the TAR recommendations.

Table 10. Proposed action deviation from TAR recommendation.

NFS Road Number	Miles	TAR Likely Needed	Proposed Action	Rationale for Deviation
4550014	0.18	Yes	Decommission	Resource protection (Shovel Creek); no need for long-term vegetation management
4635000 (the section of road beyond the 4635140 junction)	5.29	Yes	Decommission	Within designated potential wilderness
4635150	0.49	Yes	Decommission	Within designated potential wilderness
4635152	0.26	Yes	Decommission	Within designated potential wilderness
4635157	2.05	Yes	Decommission	Within designated potential wilderness
4635160	0.4	Yes	Decommission	Within designated potential wilderness
4635170	0.10	Yes	Decommission	Within designated potential wilderness
6370000 (north of Ogre Creek)	3.20	No	Change to ML 1 from previous decision to Decommission	Needed for POD ¹⁷

¹⁶ Roads associated with the AOC are assumed necessary for haul given the roadside nature of the project.

¹⁷ Potential Operational Delineation. See section 3.12 Fuels and Air Quality.

NFS Road Number	Miles	TAR Likely Needed	Proposed Action	Rationale for Deviation
6370000 (south of Ogre Creek to Round Lake)	1.50	No	Change to ML 1 from previous decision to Decommission	Needed for POD
6380120	0.76	No	Change to ML 1 from previous decision to Decommission	Needed for POD
6380130	1.91	No	Change to ML 1 from previous decision to Decommission	Needed for POD

A full list of the proposed action description by road is available in Appendix B.

Cumulatively the transportation system would continue towards attaining minimum road system objectives when combined with other vegetation management projects occurring within the planning area such as, but not limited to, the projects resulting from the Goat Thinning, Grove Thinning, Hunter Integrated Resource Project, and North Clackamas Integrated resource Project.

3.2.4 Forest Plan Consistency

The proposed action includes project design criteria and maintenance specifications that ensure proper maintenance, reconstruction and use. This is balanced with recreation use and access as well as proper seasonal operational restrictions and project design criteria E1-E10, F1-F8 and section J to ensure resource protections. Therefore, the proposed action is consistent with the Forest Wide Transportation Standards and Guidelines; FW-407 through FW-437, FW-451, and FW-452, pages Four–95 through Four–97.

The project specific transportation analysis documented in this report is consistent with guideline FW-416.

All system road decommissioning decisions would be made following the guidance provided under FW-432, therefore, the proposed action would be consistent with this standard.

3.3 Recreation

3.3.1 Existing Condition

The fires of 2020 and 2021 affected 26 developed recreation sites, 24 trailheads, and 37 trails on the District. Those are listed in Table 11, Table 12, and Table 13. While the recreation sites, trails, wilderness areas, and wild and scenic rivers listed below are within the planning area, only the effects of the proposed action to recreation resources that are within or connected to the AOC are analyzed.

Table 11. Developed recreation sites, trailheads, and trails affected by the Lionshead Fire.

Developed Recreation Sites	Trailheads	Trails
Lower Lake Campground	Fish Lake (East)	Double Peaks #735
Paul Dennis Campground	Fish Lake (West)	Fish Lake #717

Developed Recreation Sites	Trailheads	Trails
Camp Ten Campground	Horseshoe Saddle	Gibson Lake #708
Peninsula Campground	Lodgepole	Hawk Mountain #546A
Horseshoe Lake Campground	Monon Lake	Horseshoe Saddle #712
Olallie Lake Day Use Area	Olallie Lake (East)	Lodgepole #706
Olallie Lake Guard Station	Olallie Lake (West)	Monolallie #732
	Pacific Crest Trail (Breitenbush)	Monon Lake #729
	Pacific Crest Trail (Olallie)	Olallie Lake #731
	Rapidan	Pacific Crest Trail #2000
	Red Lake (East)	Potato Butte #718
	Red Lake (West)	Pyramid Butte #740
	Rhododendron Ridge (South)	Rapidan #3360
		Red Lake #719
		Rhododendron Ridge #564
		Ruddy Hill #714
		Timber Lake #733
		Top Lake #725

Table 12. Developed recreation sites, trailheads, and trails affected by the Riverside Fire.

Developed Recreation Sites	Trailheads	Trails
Armstrong Campground	Alder Flat	Alder Flat Trail #574
Big Eddy Day Use	Clackamas River	Clackamas River Trail #715
Carter Bridge Campground	Cripple Creek	Cripple Creek Trail #703
Carter Bridge Day Use	Dry Ridge	Dry Ridge Trail #518
Carter Falls Overlook Day Use	Fish Creek	Fish Creek Mountain Trail #541
Fish Creek Campground	Fish Creek Mountain	Hillockburn Trail #516
Fish Creek Day Use	Hillockburn	Memaloose Lake Trail #515
Hole in the Wall Boat Access	Memaloose Lake	Riverside Trail #723
Indian Henry Campground	Riverside (North)	
La Dee Flats OHV Staging Area	Riverside (South)	
Lazy Bend Campground		
Lockaby Campground		
Moore Creek Boat Access		
Rainbow Campground		
Ripplebrook Campground		
Riverside Campground		
Roaring River Campground		
Sandstone Boat Access		
Sunstrip Campground		

Table 13. Developed recreation sites, trailheads, and trails affected by the Bull Complex.

Developed Recreation Sites	Trailheads	Trails
None	Elk Lake Creek	Bull of the Woods #550
		Dickey Creek #553

Developed Recreation Sites	Trailheads	Trails
		Dickey Lake #549
		Elk Lake Creek #559
		Hawk Mountain Lookout #564A
		Mother Lode #558
		Rhododendron Ridge #564
		Schreiner Peak #555
		Twin Lakes #573
		Welcome Lakes #554
		West Lake Way #556

Many developed recreation sites within the planning area remain closed due to fire impacts. Limited restoration work is expected to occur in 2022 and some recreation site hazard tree abatement has already occurred at Olallie Lake and at some Clackamas River boater access sites and day use sites along Highway 224.

The planning area includes Primitive, Semi-Primitive Non-Motorized, Roaded Natural, and Roaded Modified Recreation Opportunity Spectrum (ROS) classes. The ROS classifies recreation opportunities based on the following criteria: physical setting, social setting, and managerial setting. Management of recreation on the forest is informed by the ROS. ROS classes are defined in terms of the degree to which it satisfies certain recreation experience needs measured by:

- extent to which the natural environment has been modified by management actions,
- the type of facilities provided,
- the degree of outdoors skills needed to enjoy the area, and
- the relative density of recreation use.

The existing condition for the Roaded Modified and the Roaded Natural ROS classes is not in alignment with the Forest Plan because of ongoing closure orders affecting the ability for visitors to interact with the area. The other ROS classes have not been as affected by the closure orders because of their emphasis on primitive and infrequent interaction with other users and motorized vehicles.

Congressionally designated wilderness, potential wilderness (900 acres associated with Roaring River), and five Wild and Scenic Rivers are within the planning area. Of the five Wild and Scenic Rivers within the planning area, the AOC overlaps portions of the Fish Creek, Clackamas River, South Fork Clackamas River, and Collawash River Wild and Scenic River corridors.

3.3.2 Effects Summary

Over time, implementation of the proposed action would result in restored access to recreation amenities, wilderness areas, and wild and scenic rivers within the planning area. 12 miles of road would be decommissioned, moving 900 acres of the designated potential wilderness closer to the wilderness characteristics for which it was designated, resulting in the removal of those lands from the Forest Plan C1-Timber Emphasis management area.

While wilderness areas were impacted by fires and within the planning area, there are no actions proposed within designated wilderness areas. In addition, there are no actions proposed within roadless areas or national recreation areas; none are present in the planning area.

Taking no action would result in a continuation of closed or inaccessible recreation sites.

3.3.3 Direct, Indirect, Cumulative Effects

3.3.3.1 Direct and Indirect

Developed and Dispersed Recreation: Cutting danger trees along NFS roads would enable access to developed recreation sites. Roads that access developed recreation opportunities are not proposed for closure or decommissioning. Access would be limited from NFS roads prior to and during danger tree cutting operations along roads.

Dispersed recreation: opportunities are primarily accessed via NFS roads. While cutting danger trees along roads would restore opportunities for many dispersed recreation activities, closing and decommissioning some roads would preclude motorized vehicle access and limit dispersed recreation opportunities for some visitors. However given that the miles of road proposed for decommissioning and closure makes up 4 percent of the total existing roads on the District (1,000 miles), effects would be minimal because access would become available as danger trees are cut and roads are reopened.

Trails: Danger tree cutting would result in the reestablishment of access to trails listed in Table 14 through Table 17. Access may be limited from NFS roads prior to and during danger tree cutting operations along roads. As implementation progresses, access to trails from NFS roads would be restored. Proposed road closure and decommissioning will not impact trail related recreation opportunities.

Table 14. Lionshead Fire trailheads and trails where access would be restored.

Trailheads	Trails
Horseshoe Saddle	Double Peaks #735
Monon Lake	Gibson Lake #708
Olallie Lake (West)	Hawk Mountain #546A
Pacific Crest Trail (Breitenbush)	Horseshoe Saddle #712
Rapidan	Monolallie #732
Red Lake (East)	Monon Lake #729
Red Lake (West)	Olallie Lake #731
Rhododendron Ridge (South)	Pacific Crest Trail #2000
	Potato Butte #718
	Pyramid Butte #740
	Rapidan #3360
	Red Lake #719
	Rhododendron Ridge #564
	Ruddy Hill #714
	Timber Lake #733
	Top Lake #725

Table 15. Riverside Fire trailheads and trails where access would be restored.

Trailheads	Trails
Clackamas River (East)	Clackamas River Trail #715
Clackamas River (West)	Cripple Creek Trail #703
Cripple Creek	Fish Creek Mountain Trail #541
Fish Creek Mountain	Hillockburn Trail #516
Hillockburn	Memaloose Lake Trail #515
Memaloose Lake	Riverside Trail #723
Riverside (South)	

Table 16. Bull Complex Fire trailheads and trails where access would be restored.

Trailheads	Trails
Elk Lake Creek	Elk Lake Creek Trail #559

Actions are not proposed within wilderness; however, they do impact access to three wilderness areas because access to wilderness is achieved via NFS roads and trails. The proposed action would reestablish road access to the following trails and associated wilderness areas:

Table 17. Trails and associated wilderness areas where access would be restored.

Trails	Wilderness Area Accessed
Hillockburn Trail #516	Clackamas Wilderness
Memaloose Lake Trail #515	Clackamas Wilderness
Clackamas River Trail #715	Clackamas Wilderness
Cripple Creek Trail #703	Roaring River Wilderness
Elk Lake Creek Trail #559	Bull of the Woods Wilderness

Proposed road closure and decommissioning activities will have no effect on wilderness or roadless areas. There are no effects associated with Inventoried Roadless Areas as none are present within the planning area.

Potential Wilderness & Wild and Scenic Rivers: The proposed action includes decommissioning of 9 miles of road within designated potential wilderness¹⁸. Decommissioning of roads more closely aligns with the management objectives for potential wilderness. Effects to recreation would be neutral due to the result of removing roadside dispersed recreation opportunities, while enhancing the area's wilderness characteristics.

As with wilderness, access to wild and scenic rivers would be impacted in the short-term by the proposed action. Roads and associated trail access are currently closed to portions of the Clackamas River, Collawash River, Fish Creek, and South Fork Clackamas River. Proposed treatment of hazard trees along access roads would restrict access during implementation but would ensure future access to effected river segments.

Within the Collawash Wild and Scenic River corridor 1.8 miles of road are proposed to be closed. Closure of these road segments (6380120 and 6380130) would not impact access to recreation opportunities along the Collawash River. While these road segments

¹⁸ Omnibus Public Land Management Act of 2009

are located within the corridor, they are not in close proximity to the river, and they do not provide access to known river access points.

ROS: The proposed action would result in continued access to the planning area via NFS roads. This would enable the continuation of expected maintenance of recreation amenities and roadways resulting in no impact to the ROS settings.

3.3.3.2 Cumulative

Projects that have the potential to result in incremental effects to recreation in relation to the proposed action are listed in Table 18. The primary measure used to analyze cumulative effects is access to recreation amenities.

Table 18. Projects considered for recreation cumulative effects.

Project	Overlap	Cumulative Association
Post-fire Reforestation (Riverside, Lionshead, and Bull Complex)	Yes	Authorizes some project-specific danger tree falling. Authorized cutting and leaving or repositioning of felled trees for site prep.
Clackamas Fires Danger Tree Abatement Developed Recreation and Administrative Sites	Yes	Authorizes cutting danger trees within striking distance of recreation areas and admin sites including their “associated roads” and parking areas. Specifies fall and leave, but some cut trees would need to be “removed from site where appropriate”.
4220 Road Imminent Danger Tree falling	No	Falling imminent danger trees along the portion of the 4220 road to provide safe access to Olallie Lake Resort area.
Clackamas Post-fire Recreation Site and Trail Repair	Yes	Reconstructing and repairing damaged recreation infrastructure related to recreation sites and trails.
Ongoing BAER Work	Yes	Invasive plant early detection rapid response, installation of and repairs to road gates, installation of hazard warning signs, installation/replacement and repairs to road sign, campground/trailhead repairs, trail/road repairs, vault toilet cleanup, hazardous materials containment, cultural site protections, etc.
Aquatic Restoration: Cub Creek Watershed Restoration Action Plan LWD ¹⁹ projects.	Yes	Aquatic restoration activities within Cub Creek watershed.
Partner Post-fire Recovery	Yes	PGE, BPA, ODOT, C800, and other special use permit holder and partner organization work could be ongoing while danger tree project implementation occurs.

Projects are expected to occur over several years across the burned areas of the District. Many of these projects are expected to be implemented concurrently with proposed actions. When analyzed collectively with activities related to the proposed action the projects listed in Table 18 would have noticeable impacts to recreation opportunities and recreation experiences for the foreseeable future. Recreationists visiting the planning area should expect to see and experience project related activities. This would likely include temporary road and trail closures, logging activity, heavy equipment operating alongside roads and within recreation sites, and increased project related traffic on NFS

¹⁹ Large woody debris (LWD)

roads. While noticeable, they are not expected to have cumulatively substantial impacts, recreation access and opportunity would become progressively available as the project is implemented. Overtime, cumulative effects impacting recreation access and experiences are expected to diminish.

3.3.4 Forest Plan Consistency

Access to recreation opportunities and experiences would be restored from the existing condition. As such, the proposed action is consistent with:

- Forest Plan direction and associated recreation management standards and guidelines, and
- the goals and objectives for Primitive, Semi-Primitive Non-Motorized, Roaded Natural, and Roaded Modified ROS.

The proposed action does not include modifications to recreation sites or areas.

Danger tree cutting would reestablish road access and therefore enhance recreation outstandingly remarkable values (ORVs) for the Collawash, Clackamas, and Roaring Rivers when compared to existing conditions. Proposed road closures within the Collawash Wild and Scenic River corridor would have no appreciable effect on recreation or river related access.

3.4 Visuals

3.4.1 Existing Condition

Fire-related tree mortality has greatly reduced canopy cover throughout the project area, resulting in increased visibility of the ground, especially in the foreground distance zone (within a one-half mile of viewer positions). While the project area's pre-fire landscape character was more visually dominated by landform and vegetation, the post-fire landscape character is more dominated by landform, rock form, and waterbodies at many locations. The post-fire landscape character is much more defined by the visible effects of the fires than was the case previously when isolated burn scars along Hwy. 224 stood out as a visual contrast to the surrounding dense stands of vegetation.

These wildfires were not intentional Forest management activities; therefore, they did not actually compromise the project area's existing visual quality even though they had a major effect on its predominant landscape character and a lesser effect on its scenic attractiveness at specific locations. Despite the area's widespread vegetative losses, the post-fire landscape generally has the same potential to meet Forest Plan Visual Quality Objective (VQO) requirements as it would have had prior to the fires, since VQOs are focused on deviations associated with management activities that result in visual contrasts with the surrounding landscape character, which is now predominantly characterized by the visual effects of the fires rather than by its pre-fire appearance. The loss of canopy cover and increased visibility of the ground surface through the trees does not introduce new unnatural colors, textures, or other visual elements that are uncharacteristic of the surrounding post-fire landscape. While blackened tree trunks and exposed soil may visually dominate in the short-term in some areas, especially in the immediate foreground (within 300 feet of viewer positions), their color and/or textural dominance would increasingly be reduced by the regrowth of understory, and eventually overstory, vegetation over a short- to long-term timeframe.

Color and textural changes to the immediate foreground landscape character are shown in the before (Figure 1) and after (Figure 2) photos below. Due to topography and vegetation, immediate foreground views from the road were the most common types of views along the project area's primary travelways (designated viewshed and Wild and Scenic River (WSR) corridors) prior to the fires. As a result of fire-related vegetation loss, foreground views of the surrounding landscape have now become more common at many locations. A comparison of Figure 3 and Figure 4 show the change in landscape character from pre-fire to post-fire conditions. In addition, these figures illustrate a rare example of a middleground (one-half mile to five miles) view from a primary travelway in the project area, which is not common in the project area due to topographic screening, despite vegetative losses.

Figure 1. Photo taken at Clackamas River Trailhead (Fish Creek) prior to the Riverside Fire.



Figure 2. Photo taken at Clackamas River Trailhead (Fish Creek) after the Riverside Fire.



Figure 3. Photo taken at Hwy. 224 wayside between Indian Henry Campground and the Alder Flat Trailhead before the Riverside Fire.



Figure 4. Photo taken at a Hwy. 224 wayside between Indian Henry Campground and the Alder Flat Trailhead after the Riverside Fire.



However, at various locations throughout the project area, the reduced vegetative screening in the post-fire landscape has made existing management activities and constructed features in the foreground more visible than they would have been before. Examples include powerline corridors, roads, and the Oak Grove PGE power station that are now subject to increased visibility from Hwy. 224 and the Clackamas River. At site-specific locations where the resultant visual contrasts with the surrounding landscape character are now most apparent (as shown in Figure 5 and Figure 6), the existing visual quality may have been reduced from Retention to Partial Retention or even Modification as a result of the management activities that created the linear visual contrast from the presence of the log deck. The Forest Plan's VQO requirements may no longer be met at such locations, necessitating targeted visual rehabilitation efforts to achieve Forest Plan consistency over a long-term timeline.

Figure 5. Alder Flat Trailhead before the Riverside Fire.



Figure 6. Alder Flat Trailhead after the Riverside Fire.



Prior to the fires, the project area's primary recreation travelways and use areas were characterized by Level 1 sensitivity (high public interest in scenery). Those portions of the landscape that can be seen from primary travelways and use areas (especially in the immediate foreground and foreground distance zones) are subject to the highest levels of landscape visibility throughout the entire project area. The other roads, trails, and waterways throughout the project area functioned as secondary recreation travelways prior to the fires but still would have been subject to differing sensitivity levels and levels of interest in scenery, depending on the specific travelway.

Some aspects of landscape visibility have undergone drastic short-term changes, such as the current lack of visitor use throughout the project area's recreation travelways and use areas (due to post-fire closure orders), resulting in a limited public perception of the changes that have occurred to the surrounding landscape character and scenic attractiveness. However, there remains a high level of public interest in scenery throughout the project area, given its close proximity to the Portland metropolitan area and its large concentration of developed recreation sites, designated viewsheds, and WSR corridors.

3.4.2 Effects Summary

Effects are disclosed based on impacts to landscape character, scenic attractiveness, visual quality objectives, and landscape visibility. The project activities would primarily result in direct effects to visual resources by creating visual contrasts to the surrounding natural or natural-appearing landscape character. In some areas the proposed action may result in beneficial effects improving views from some areas. The project has been designed to minimize impacts to scenic values. Some PDC are specifically focused on achieving a Retention or Partial Retention²⁰ VQO (where those VQOs are prescribed) at locations where project activities would potentially be visible from designated viewsheds, WSR corridors, and Sensitivity Level 1 trails.

3.4.3 Direct, Indirect, Cumulative Effects

3.4.3.1 Direct

Landscape Character: Due to their limited scale and scope in comparison to the expanse of the surrounding post-fire landscape, project activities are not anticipated to have a substantial impact on the project area's present landscape character, except in the immediate foreground and foreground of primary recreation travelways and use areas, where the visual effects of management activities would be most noticeable to the greatest number of visitors.

Scenic Attractiveness: Scenic attractiveness is based on the entire composition of vegetative patterns, landform, rock form, and waterbodies that are visible throughout the surrounding landscape. Project activities would have a direct impact on vegetation rather than on landform, rock form, or waterbodies, and thus would only have a minor effect, if any, in reducing the scenic attractiveness along roads when those activities are viewed as part of the broader landscape. Instead, project activities would have the potential to increase scenic attractiveness at various locations where vegetation removal alone, or in

²⁰ The Retention VQO is characterized by naturally appearing landscape character. The Partial Retention VQO is characterized by slightly altered landscape character.

combination with fire-related vegetation loss beyond, would create new vistas of unique landscape features that were previously screened from view.

Visual Quality Objectives: Alterations to the landscape character in the immediate foreground and foreground of viewer positions with more stringent VQO prescriptions would be lessened by the implementation of scenery PDC as part of project activities. At other locations, project activities are only anticipated to result in moderate alterations to the landscape character (equivalent to a Modification VQO), but not “heavy” alterations (equivalent to a Maximum Modification VQO), because the project area’s topography and remaining vegetation would screen the activities in the middleground of many viewer positions such that the small scale of project activities, when viewed against the broader middleground landscape, would not result in visual dominance beyond the foreground distance zone.

Landscape Visibility: The highest sensitivity levels from the public are anticipated where project activities would be visible in the immediate foreground and foreground of primary recreational travelways and use areas. Lower sensitivity levels are anticipated where project activities would be visible from secondary travelways or where they would be visible in the middleground (one-half mile to five miles) or background (more than five miles) from primary travelways and use areas. Several factors play into landscape visibility determinations besides the distance between project activities and viewer positions, including the number and types of potential viewers who may occupy those positions, the number and intensity of focal points that compete with those positions’ immediate surroundings for attention, the location of project activities above or below viewer positions, and the duration of views of project activities from viewer positions.

3.4.3.2 Indirect

Potential negative indirect effects resulting from project activities could include a diminished recreation experience for visitors at areas with greater landscape character alterations and greater landscape visibility. This could result in reduced tourism, a negative image of public land management, and diminishing visitor respect for the land. Also, project activities could increase visibility and viewer sensitivity for future unrelated projects on the Forest. However, it is challenging to analyze the indirect effects for visual resources and recreation, as evidenced by several of the information, inventory, and research needs identified in the Forest Plan.

3.4.3.3 Cumulative

The following projects were assessed for cumulative impacts:

- danger tree cutting along Rd. 4220 to provide Olallie Lake Resort access,
- partner post-fire recovery efforts (i.e., danger tree cutting along Hwy. 224 and powerlines),
- hazard tree cutting at developed recreation and administrative sites,
- thinning and integrated resource project activities including Goat Mountain Thin, Hunter Integrated Resource Project, North Clackamas Integrated Resource Project, and Grove Thin,
- recreation site danger tree abatement and repair, and
- post-fire reforestation.

Danger tree cutting along Hwy. 224 and powerlines, and hazard tree cutting at developed recreation sites along Hwy. 224 would not overlap in space with the proposed action's project activities but would overlap in time (including the long-term visual impacts resulting from the various projects). Hazard tree cutting at developed recreation sites along NFS Road 4600000 and throughout the Olallie Lake Scenic Area (A4 MA) would overlap in space and time with the proposed action's project activities. In both cases, the aggregate visual disturbance and diminished recreational experience resulting from the different projects could be greater than would otherwise have been the case if the proposed action's project activities were not performed.

PDC are critical for minimizing visual contrasts with the surrounding landscape character, especially in the immediate foreground and foreground of designated viewsheds, their associated developed recreation sites, WSR corridors, and the Olallie Lake Scenic Area. These locations are where landscape visibility is anticipated to be the highest, where more stringent VQO prescriptions apply, and where the greatest potential for negative cumulative effects to visual resources exists throughout the entire planning area. However, post-fire reforestation could result in a positive cumulative effect for visual resources where the associated reforestation activities would more quickly reduce long-term visual contrasts resulting from the proposed action's project activities.

3.4.4 Forest Plan Consistency

The proposed action was evaluated for consistency with visual resources management direction found in the following:

- Forest Plan goals and management area direction,
- Clackamas River Comprehensive River Management Plan (CRMP),
- West Cascades Scenic Byway Corridor Plan,
- Roaring River CRMP,
- Nine Rivers CRMP, and
- The Riverside Fire Rapid Assessment Team Report.

The proposed action²¹ is consistent with the direction, standards, and guidelines in the listed plans and reports. The project was found consistent because PDC were developed to maintain, protect, or enhance visual resources and scenic values including outstandingly remarkable values associated with the Wild and Scenic River corridors. Specifically, PDC K8 recommends that after project implementation a focused visual rehabilitation plan should be developed for areas of highest visibility or concentrated use.

3.5 Wildlife

3.5.1 Existing Condition

3.5.1.1 Northern Spotted Owl (NSO)

²¹After further review resulting from the 30-day comment period on the draft EA (as documented in the decision notice), the 25-acre AOC on NFS Road 4500000 that overlaps the wild designated South Fork Clackamas Wild and Scenic River corridor has been removed from the project to ensure consistency with the preservation VQO (Forest Plan standard FW-496) and protect the associated scenery ORV.

Prior to the fires 54 percent of the 281 historical NSO sites on the Forest occurred within Wilderness or Late Successional Reserves (i.e., protected habitat). Of those sites, 66 percent had greater than, or equal to 50 percent suitable habitat in the core area and greater than, or equal to 40 percent suitable habitat in the home range. Across the planning area, a total of 55 historic nest sites were impacted by the fires. Of those, 20 historic nest sites are no longer viable (Table 19). Of the remaining 35 sites, only 12 meet the “priority site conditions” of greater than, or equal to 40 percent home range and greater than, or equal to 50 percent core area suitable (nesting, roosting, foraging (NRF)) habitat.

Table 19. Historic NSO nest sites impacted by the fires.

Fire name	Number of sites impacted by fires	Number of sites no longer viable²²	Number of sites meeting priority site conditions
Riverside Fire	32	18	4
Lionshead Fire	13	2	1
Bull Complex	10	0	5

Of the 35 remaining viable sites within the fire boundaries, 4 have some part of the AOC running through portions of a nest patch. Three of the four sites are within critical habitat. One site with suitable habitat within the AOC accounts for 35 percent of the NRF within the nest patch. Another site with suitable habitat within the AOC accounts for 20 percent of the NRF within the nest patch. The other two sites that have suitable habitat overlapping the AOC accounts for 18 percent and 35 percent NRF for each site.

After the fires there are 17,060 acres of NSO nesting/roosting habitat, 12,455 acres of foraging habitat and 17,811 acres of dispersal habitat within the fire boundaries. This represents an estimated loss of 23,319 acres (58 percent) of NR, 10,198 acres (45 percent) of Foraging and 22,413 acres (56 percent) of dispersal NSO habitat from within the three fire boundaries as a result of the fires. This accounts for a total loss of 29,516 acres (47 percent) of NRF within the fire boundaries as a result of the fire. 83 percent (27,670 acres) of the suitable (NRF) NSO habitat acres lost were within the Riverside Fire.

As a result of the fires, 46,677 acres of post fire foraging (PFF) habitat was designated within the planning area. These acres occur along the edges of the remaining ‘green’ NRF habitat. See section 2.2.1b of the Wildlife Report for information on PFF designation criteria. Of the acres designated as PFF, 1,943 acres (4 percent) overlap with the AOC. For the purpose of the wildlife report, ‘green’ trees or ‘green’ NSO habitat refers to habitat and trees that meet the ‘green tree’ criteria as defined in the Biological Assessment For Routine Land Management Activities with a Potential to Modify Habitat which are Not Likely to Adversely Affect Federally Listed Species within the Willamette Planning Province of Oregon (2018) (NLAA BA), or in the Critical Habitat Rule (2012). Additionally, ‘green trees’ as referenced in the wildlife report would not always meet the danger tree criteria for this project.

Currently, within the fire boundaries there is an estimated 29,515 acres of NSO suitable (NRF) habitat remaining post-fire. 2,205 acres (29 percent) of the remaining NSO

²² Methodology Section 2.2 of the Wildlife Report provides additional context.

suitable habitat is located within the AOC. A breakdown of acres and percent habitat within the AOC by habitat type and fire boundary can be found in Table 20.

Table 20. Post-fire acres within the AOC and percentage of post-fire NSO habitat (AOC/total habitat) within each fire area by habitat type.

Fire Name	Nesting/Roosting	Foraging	PFF²³	Dispersal	Non-Habitat
Riverside	853 (10%)	973 (12%)	1,527 (5%)	1,232 (10%)	501 (11%)
Lionshead	84 (8%)	127 (11%)	342 (4%)	193 (8%)	156 (10%)
Bull Complex	78 (1%)	90 (3%)	74 (1%)	80 (3%)	58 (4%)

Of the remaining NSO suitable habitat within the Riverside Fire boundary, 10.8-percent (1,825.8-acres) are within the AOC. The percentages of NSO suitable habitat within the AOC in the Lionshead and the Bull Complex fires are 9.3-percent (211.7-acres) and 1.6-percent (168.0-acres) respectively.

Of the remaining NSO dispersal habitat within the Riverside Fire boundary, 10 percent (1,232 acres) are within the AOC. The percentages of NSO suitable habitat within the AOC in the Lionshead and the Bull Complex fires are 8 percent (193 acres) and 3 percent (80 acres) respectively.

Prior to the fires there were 26,039 acres within the fire perimeters that also fell within designated LSR (Table 21). Of those, 7,061 acres overlapped with designated NSO critical habitat. After the fires, 10,327 acres of LSR remained within the project area, of which 1,173 acres are within the AOC. Of the 1,173 within the AOC, 666 acres are designated as both LSR and critical habitat.

Table 21. Post-fire existing condition (acres) of late-successional reserve (LSR) designated habitat within the fire boundaries.

Fire Name	Pre-fire LSR	Pre-fire LSR/Critical Habitat	Post-fire LSR acres w/greater than, or equal to 51 percent burn severity	Current LSR²⁴ in AOC	Current LSR/Critical Habitat in AOC
Riverside Fire	19,312 (23%)	5,387	12,196 (63%)	922	539
Lionshead Fire	5,743 (34%)	691	3,182 (55%)	191	67
Bull Complex	984 (5%)	984	334 (34%)	61	61

Prior to the fires, 67,782 acres of critical habitat was within the fire boundaries. This habitat fell within the West Cascade South (WCS) subunits WCS 1 and WCS 2. After the fires 32,936 acres of post-fire critical habitat remained within the fire boundaries, of which 2,243 acres (7 percent) are located within the AOC. Of the critical habitat acres within the AOC, 943 acres (42 percent) are suitable NSO habitat, and 473 acres (21 percent) are dispersal habitat.

²³ Note that PFF habitat identified in this project does not meet the “green tree” description of foraging habitat in the NLAA BA (p. 9) or in the Critical Habitat Rule (2012 Revised Final CH Rule, p.71907). In those documents, the habitat would be considered non-habitat due to the lack of canopy cover. Where PFF was found along the Lionshead/Bull Complex shared boundary, PFF was counted as part of the Lionshead Fire.

²⁴ Does not include pre-fire LSR acres that experienced a burn severity greater than, or equal to 51 percent.

Of the post-fire critical habitat acres located within the AOC 59 percent (1,328 acres) are within the Riverside Fire area. The proposed AOC includes 942 acres of NSO suitable habitat and 377 acres of dispersal.

3.5.1.2 Gray Wolf

Potential habitat is known to be present within the project area. There are no known there are no known wolf packs, dens, or rendezvous sites in the Clackamas River District. However, individuals have been known to disperse into the eastern portions of the project area on rare occasions.

3.5.1.3 Bald Eagle

Nesting, wintering, and migrating bald eagles have been documented on the Forest. Bald eagles, during migration, are common and can occur sporadically throughout the planning area and temporary roost sites during migration are determined more by the availability of carrion than any other factor. Nest sites are typically, near a large bodies of water such as rivers or lakes.

3.5.1.4 Harlequin Duck

While the full extent of potential harlequin duck habitat has not been mapped or modeled on the Forest, this species is known to have occurred in areas throughout the planning area. The post fire available habitat is anticipated to have been reduced as a result of the fire.

3.5.1.5 Fringed Myotis

This species may utilize portions of the Forest, however due to the inherent unreliable nature and impermanence of snag roosting structures, it is not possible to know how many there are across the project area or how many individuals are utilizing each roost. Areas that experienced a high severity fire likely lost most of the active or potential pre-fire snag roosts.

3.5.1.6 Larch Salamander

While this species utilizes a wide-range of habitats, its full distribution across the project area is not known. However, any suitable habitat that experienced a high severity fire throughout the project area is likely no longer viable. This species is thought to have limited dispersal ability, making daily-to-seasonal vertical migrations across the ground as microclimate conditions change, but not extensive horizontal overland movements. A district-wide estimated population is not known for this species, and it is not possible to estimate how many individuals may have been lost as a result of the fire. They are a limited mobility species, so it is likely most individuals within areas of a high burn severity were impacted or killed by the fires.

3.5.1.7 Copes Giant Salamander

Cope's giant salamanders are primarily associated with small to medium-sized mountain streams in moist coniferous forests. Although we know there is potential habitat within the project area, this is a rare species to encounter on the forest and not much is known of its distribution throughout the project area prior to the burn.

3.5.1.8 Western Bumblebee

Bumblebee habitat is known to occur on the Forest, but habitat is not mapped. Due to the large extent of the planning area, limited access resulting from the fire, the entirety of the potential habitat within the AOC has not been mapped. Focused surveys for the Western bumblebee have not occurred within the planning area boundary. Prior to the fires flowering plants were widespread throughout the planning area and were abundant within the riparian areas and are in the recovery process. Areas that experienced a high severity fire likely lost most of the active or potential habitat.

3.5.1.9 Mule Deer and Elk

There are no B10-Deer and Elk Winter Range management areas within the AOC. There are 176 acres of B11-Deer and Elk Summer Range within the AOC. About 51 acres of the B11 management area experienced a greater than 50 percent burn severity. Areas of non-designated winter and summer habitat that experienced a high severity fire likely lost most of the active or potential habitat.

3.5.1.10 Pileated Woodpecker

The AOC includes 343 acres of B5-Pileated Woodpecker/American Marten management area (0.5 percent of all B5 allocated acres on the Forest). B5 is a non-dominant allocation defined in the Forest Plan. 46% of the acres experienced a stand replacing burn severity. Within the AOC there are 1,173 acres of LSR which did not experience a stand replacing burn severity and may still provide habitat. Additional habitat information is discussed within the snags and downed wood section.

3.5.1.11 American Marten

Although the pre-fire full distribution of this species within the project area is not known, this species is known to occur within the project area. This species is known to utilize habitat similar to pileated woodpeckers, including B5 habitat. Areas of pre-fire potential habitat that experienced high severity fires likely are no longer habitat. Areas of low or moderate burn severity may still contain areas of potential habitat.

3.5.1.12 Neotropical Migratory Birds

Table 22 provides a summary of the existing condition for migratory birds within the planning area.

Table 22. Landbirds of Conservation Concern and their BCR, Oregon and Washington Partners in Flight Plan focal species list, and disposition.

Species	List	Disposition
Yellow-billed Loon	BCR 5	No habitat on Forest.
Western Grebe	BCR 5	No habitat in planning area.
Bald Eagle	BCR 5	Region 6 Sensitive Species – Addressed above.
Northern Goshawk	BCR 5	Mature forest – No habitat in Planning area.
Peregrine Falcon	BCR 5	Region 6 Sensitive Species – Addressed above.
Blue (Sooty) Grouse	OR-WA PIF	Forested landscape mosaic – No habitat in planning area.
Solitary Sandpiper	BCR 5	No occurrence on Forest.

Species	List	Disposition
Band-tailed Pigeon	OR-WA PIF	Species present on Forest. No habitat in planning area - Mixed conifer/deciduous forest with nearby mineral sites.
Black Swift	BCR 5, OR-WA PIF	Unknown from the Mt. Hood NF – No habitat in Planning area
Vaux's Swift	OR-WA PIF	Species present on Forest. Old growth forest with large snags – No habitat in planning area.
Rufous Hummingbird	BCR 5, OR-WA PIF	Open areas with forested edges and abundant nectar-producing plants – No habitat in planning area.
Allen's Hummingbird	BCR 5	Not found on the Forest.
Pileated Woodpecker	OR-WA PIF	Forest MIS – No habitat in planning area.
Northern Flicker	OR-WA PIF	Open mixed conifer forest – No habitat in planning area.
Pacific-slope Flycatcher	OR-WA PIF	Species present on Forest. Old growth/mature forest with deciduous canopy trees – No habitat in planning area.
Olive-sided Flycatcher	BCR 5, OR-WA PIF	Species present on Forest. Mixed conifer forest, disturbed forest – No habitat in planning area.
Willow Flycatcher	BCR 5	Species present on Forest. Deciduous thickets (willows) usually near water. No habitat in planning area.
Hammond's Flycatcher	OR-WA PIF	Species present on Forest. Mixed conifer forest – No habitat in planning area.
Horned Lark	BCR 5	No habitat on Forest.
Brown Creeper	OR-WA PIF	Species present on Forest. Old growth/mature, large trees – No habitat in planning area.
Winter Wren	OR-WA PIF	Species present on Forest. Mature coniferous forest – No habitat in planning area.
Varied Thrush	OR-WA PIF	Species present on Forest. Old Growth/mature – No habitat in planning area.

3.5.1.13 Snags and Down Wood

A stand replacing burn severity is considered at greater than 51 percent basal area mortality. For the Riverside and Lionshead Fires a majority of the forested area burned at greater than 76 percent basal area mortality. All three fires experienced 37 percent or greater fire replacing burns: Riverside 37 percent; Lionshead 46 percent; and Bull Complex 37 percent. This degree of mortality generally consumes existing snags and logs as well as adds a large number of snags (various sizes) which would fall over time. For the District that encompasses the project area, snag abundance at the landscape level would likely be above the 80-percent tolerance level for quite some time. Overall, snag density appears to have been maintained across the landscape and would continue to support species.

3.5.1.14 Region 6 Sensitive Mollusks

The following sensitive mollusks are considered at the group level: Puget Oregonian, Columbia Gorge Oregonian, Dalles Hesperian, Dalles Sideband, and Shiny Tightcoil. Terrestrial mollusk species are reviewed as a group for this analysis with the presence of potential habitat or individuals of each species serving as the indicators. Surveys for these species occur on a project-by-project basis. While the full extent of potential habitat for each of these species has not been mapped, potential habitat is known to have occurred in areas throughout the planning area and AOC although areas of high severity fires are less likely to have any remaining suitable habitat for these species.

3.5.2 Effects Summary

Table 23 provides an overview of effects determinations for wildlife species analyzed.

Table 23. Wildlife summary of effects.

Key Issue Addressed ²⁵	Species	Effects Determination	Effects Summary
T&E	NSO Individuals (a) and NSO Habitat not designated as Critical (b-e)	a. Individuals/Pairs – NLAA b. Non-Designated Habitat – NLAA c. Individual Tree Removal – NLAA d. Post-fire Foraging (PFF) – LAA e. Green Dispersal and Nesting/ Roosting/ Foraging (NRF) - NLAA	a. No direct effect, effects abated with PDC (see USDI 2017; USDA 2022). b. No direct effect to overall NSO habitat due to tree removal in a limited linear corridor within a larger stand. c. No direct effect to overall NSO habitat due to limited tree removal. d. Direct effect, under current consultation documents, PFF treatment would count as habitat removal (see USDI 2021). e. No direct effect. Green trees not proposed for treatment.
T&E	NSO Critical Habitat	a. Unsuitable Habitat b. Post-fire Foraging – LAA c. Green Dispersal and NRF- NLAA or LAA	a. No direct effects to currently functional spotted owl habitat. b. Direct effect, under current consultation documents, PFF treatment would count as habitat removal (see USDI 2021). c. Depends on site conditions and # of trees treated. To be conservative for the persistence of the species; assume LAA unless a site visit determines NLAA.
T&E	Gray Wolf	NLAA	No known individuals within the planning area and limited impact to (non-designated) habitat due to limited tree removal.

²⁵ T&E: Threatened and Endangered. RFSS: Regional Forester Sensitive Species. MIS: Management Indicator Species. MBTA: Migratory Bird Treaty Act.

Key Issue Addressed²⁵	Species	Effects Determination	Effects Summary
Survey and Manage	All Survey and Manage species within AOC	Not likely to have a significant negative impact on survey and manage species or their habitat.	The proposed action is consistent with the 2001 Survey and Manage Record of Decision survey protocols.
RFSS	Bald Eagle	May have short term impacts that adversely impact some individuals, not likely to result in the loss of viability nor cause a trend towards federal listing. No long-term effects.	Effects abated with nesting raptor and seasonality PDC.
RFSS	Harlequin Duck	May have short term impacts that adversely impact some individuals, not likely to result in the loss of viability nor cause a trend towards federal listing. No long-term effects.	Effects abated with nesting, riparia, down wood and seasonality PDC.
RFSS	Fringed Myotis	May have short term impacts that adversely impact some individuals, not likely to result in the loss of viability nor cause a trend towards federal listing. No long-term effects.	Main effect due to impacts to snags. Snag PDC are in place, and it is expected snag density would increase in future as a result of other tree loss resulting from the fires.
RFSS	Larch Salamander	May have short term impacts that adversely impact some individuals, not likely to result in the loss of viability nor cause a trend towards federal listing. No long-term effects.	Effects abated with riparian PDC.
RFSS	Cope's Giant Salamander	May have short term impacts that adversely impact some individuals, not likely to result in the loss of viability nor cause a trend towards federal listing. No long-term effects.	Effects abated with riparian PDC.
RFSS	Western Bumblebee/ Suckley Bumblebee	May have short term impacts that adversely impact some individuals, not likely to result in the loss of viability nor cause a trend towards federal listing. May have beneficial long-term effects.	Short term effects abated with riparian PDC. May have beneficial long-term effects as grass and forbs grown into open area resulting from the fires.
RFSS	R6 Sensitive Species Mollusks	May have short term impacts that adversely impact some individuals, not likely to result in the loss of viability nor cause a trend towards federal listing.	Effects abated with riparian and snag and down wood PDC .

Key Issue Addressed ²⁵	Species	Effects Determination	Effects Summary
MIS	Mule Deer /Elk	a. Cumulative effects would be minimal. b. There may be some long-term beneficial effects.	a. Short term disturbance to some individuals. The loss of habitat is linear (along roads) and would be insignificant at the scale of the Forest. b. Additional habitat, less fragmentation of habitat.
MIS	Pileated Woodpecker	Cumulative effects would be minimal.	May have short term impacts on individuals, but is not likely result in additional habitat loss.
MIS	Pine Marten	Cumulative effects would be minimal.	May have short term impacts on individuals, but is not likely result in additional habitat loss.
MBTA	Neotropical Migratory Birds	The proposed action would have no long-term effects.	Potential impacts during breeding season abated with seasonal PDC (USDA 2022).
Snags and Down Wood	N/A	The proposed action would have no long-term effect on snag abundance across the AOC or Forest.	Would reduce the amount of downed wood adjacent to the roads. Due to the fire, downed wood levels are estimated to meet or exceed the historic range of variability at the 5 th field watershed scale for the three fire boundaries that contain the AOC.

Generally, in the absence of taking action, the absence of human activity would benefit most species. However, delayed response times to future wildfire due to inaccessible forest roads could result in an increase of habitat loss for wildlife species resulting in immediate-term negative impacts to species and habitat. Over time, most wildlife species and habitat would be expected to recover in the long-term.

3.5.3 Direct, Indirect, Cumulative Effects

Similar projects are being planned on BLM and Willamette NFS lands. The area of analysis for wildlife resources is limited in scope to the burned areas on the Forest due to linear nature of the proposed action.

3.5.3.1 Northern Spotted Owl

Direct and indirect: Effects determinations incorporate the application of PDC developed specifically for this project. PDC are expected to minimize impacts to species and resources, however, they do not eliminate all impacts in every case. See also Table 24 and Table 25 for a summary.

Effects of noise disturbance to individuals, nest sites, and prey species from danger tree cutting and heavy equipment operations ***may affect but are not likely to adversely affect.***

Habitat not designated as NSO critical habitat: Treatments would be limited to fall and leave in all suitable (nesting, roosting, and green foraging habitat) ***may affect but are not likely to adversely affect*** NSO habitat not designated as critical habitat. There are 473 acres of NSO dispersal habitat not designated as critical habitat within the AOC. Danger

tree cutting within dispersal habitat are not anticipated to lower canopy cover to below 40 percent given current post-fire conditions. Therefore, danger tree cutting actions *may affect but are not likely to adversely affect* NSO dispersal habitat not designated as critical habitat. While it is not expected, if it were later determined that danger tree cutting within a specific area of dispersal habitat that overlaps the AOC would result in less than 40 percent canopy cover, then the actions *may and are likely to adversely affect* NSO habitat and would be treated as habitat removed. 1,304 acres of PFF habitat not designated as critical habitat may be treated. Danger tree cutting actions within these PFF habitat not designated as critical habitat *may and are likely to adversely affect* NSO PFF habitat and would be treated as habitat downgrade (HD).

NSO Critical Habitat: 2,243 acres of NSO critical habitat are located within the AOC, of which 943 acres are suitable NSO critical habitat. Treatment within NSO suitable critical habitat will be limited to fall and leave and *may affect but are not likely to adversely affect* suitable NSO critical habitat. The exception to this is when it occurs within a known or historic nest patch. The AOC intersects three historic nest patches that are still viable: accounting for 28 acres of suitable critical habitat. Treatment in those areas *may and are likely to adversely affect* NSO critical habitat.

378 acres of critical habitat designated as dispersal may have roadside danger trees cut within it. It is not anticipated that treatments within dispersal habitat would lower canopy cover below 40-percent canopy cover. Potential treatment in dispersal critical habitat when maintained at greater than 40 percent canopy cover *may affect but are not likely to adversely affect* NSO dispersal critical habitat. While it is not expected, if it were later determined treatment to a specific area of dispersal habitat within the AOC would result in a percent canopy cover below 40-percent, it *may and are likely to adversely affect* NSO dispersal critical habitat and would be treated as habitat removed.

640 acres of PFF critical habitat may not be affected. There is much still not understood about the impact of danger tree treatments to the structure and longevity of PFF. Where danger tree cutting occurs within PFF critical habitat, activities *may and are likely to adversely affect* NSO PFF critical habitat and would be treated as habitat downgrade (HD).

Road closing and decommissioning: Because the proposed road treatments would not impact physical and biological features (PBFs) at the stand scale these activities *may affect but are not likely to adversely affect* NSO.

Table 24. Summary of actions and associated proposed acreages identified as Not Likely to Adversely Affect (NLAA) NSO habitat.

Effect Determination	Proposed Action	Justification	Type of Action Acres Would Be Recorded Under	Planned Acres
May affect, not likely to adversely affect (NLAA)	Disturbance to NSO individuals/ pairs	The effects of the proposed action on disturbance to NSO is considered NLAA because seasonal restrictions will be applied during the critical breeding season to mechanical activities and to prescribed burning unless surveys are done to prevent disruption of NSO. PDC are in place to help minimize and potential impacts to individuals or pairs.	N/A	N/A
May affect, not likely to adversely affect (NLAA)	Treatment in Nesting/ Roosting (NR) habitat acres	Treatments in “green tree” nesting/ roosting habitat when habitat conditions are maintained as defined in the NLAA and LAA when ‘fall and leave’ treatments occur.	Harvest Habitat Maintained (HHM) Nesting/ Roosting Habitat	470
May affect, not likely to adversely affect (NLAA)	Treatment in “green tree” foraging (F) habitat acres	Treatments in “green tree” foraging habitat when habitat conditions are maintained as defined in the NLAA and LAA when ‘fall and leave’ treatments occur.	Harvest Habitat Maintained (HHM) Foraging Habitat	473
May affect, not likely to adversely affect (NLAA)	Treatment in dispersal (D) habitat acres	Harvest activities that maintain habitat (nesting/roosting, foraging or dispersal) are considered NLAA. Acres counted as NLAA when treatment would not negatively affect the functionality of a home range, including nest patch. The proposed action removes only dead and dying trees within striking distance of the road, while maintaining snags and down wood. Activities from this proposed action are not expected to exacerbate the impacts of the fire in the habitat or result in further degradation.	Harvest Habitat Maintained (HHM) Dispersal Habitat	378
May affect, not likely to adversely affect (NLAA)	Potential treatment in unsuitable, Critical Habitat acres	Treatments occurring in designated critical habitat in other than nesting/roosting/foraging or dispersal habitat.	Harvested in Non-habitat	283
May affect, not likely to adversely affect (NLAA)	Potential treatment in dispersal, CH when maintained at >40-percent canopy cover or greater	Habitat that supports the transience and colonization phases of dispersal, which spotted owls can fly through, distinct from NRF. Post treatment would maintain >40-percent canopy cover and maintain dispersal habitat.	Harvest Habitat Maintained (HHM) Dispersal Habitat	378

Table 25. Summary of actions and associated proposed acreages identified as Likely to Adversely Affect (LAA) NSO habitat.

Effect Determination	Proposed Action	Justification	Type of Action Acres Would Be Recorded Under	Planned Acres
May affect, likely to adversely affect (LAA)	Potential treatment in post fire-foraging (PFF) habitat acres	Minimal impact to post fire foraging acres within the AOC would occur. To be conservative any PFF acres treated (even those not in critical habitat) are considered as Likely to Adversely Affect (LAA).	Habitat Downgrade (HD) Spotted Owl Foraging	1,943
May affect, likely to adversely affect (LAA)	Potential treatment in nesting/roosting habitat acres	LAA when the action occurs in nest patch of a known spotted owl site. When PBF's would be altered and treatment would negatively affect the functionality of the stand, either directly or indirectly, regardless of spotted owl occupancy.	Habitat Downgrade (HD) Spotted Owl Nesting / Roosting	14
May affect, likely to adversely affect (LAA)	Potential treatment in "green-tree" foraging habitat acres	LAA when the action occurs in nest patch of a known spotted owl site. When PBF's would be altered and treatment would negatively affect the functionality of the stand, either directly or indirectly, regardless of spotted owl occupancy.	Habitat Downgrade (HD) Spotted Owl Foraging	14
May affect, likely to adversely affect (LAA)	Potential treatment in nest/roosting (NR) habitat acres	NLAA or LAA depending on site conditions and number of trees fallen and removed, but to be conservative for the persistence of the species, will be LAA unless a site visit determines it meets NLAA. LAA when the action occurs in nest patch of a known spotted owl site. Many of the "green-tree" areas will have few danger trees, but this cannot be assessed for certain in many cases without additional field review.	Habitat Maintained (HM) Nesting/Roosting	11

Cumulative: PDC have been included to help mitigate short and long-term affect to NSO individuals and nest sites for this project and others considered in the analysis. Cumulative impacts from this and other reasonably foreseeable future projects would not prevent NSO from utilizing the available habitat, returning to historic sites that remain viable after the fires, moving into and establishing new territories, and dispersing throughout the area. Cumulative effects would be minimal to NSO species and their habitat.

3.5.3.2 Gray Wolf

Direct and Indirect: PDC are included to protect Gray Wolves if discovered during implementation. There would be no impacts to packs or dens because there are no known sites on the district. There is a possibility of individuals roaming through the area, therefore the project's activities *may affect but are not likely to adversely affect* gray wolves. Indirectly, Removing standing dead trees may allow for areas to increase in forage species utilized by large prey species. Therefore, the project's activities *may affect but are not likely to adversely affect* gray wolf habitat.

Cumulative: There would be no impacts to wolf packs, dens, or rendezvous sites within the planning area or a mile of the project boundary, therefore there would be no cumulative effects to packs, dens or rendezvous sites. Direct and indirect effects to the Gray Wolf would be minor, and the species does not require dead wood or snags in their habitat. Cumulative impacts to the Gray Wolf are minor.

3.5.3.3 Bald Eagle

Direct and Indirect: Danger tree cutting would occur along roadways and would be commensurate with the mosaic burn of the fire. This would result in a 'feathered' effect in treated areas. Additionally, in areas impacted by the fire across the larger spatial habitat landscape that exists outside the linear segments, there would be an excess of both deadwood and snags as a result of the fire. PDC are developed for when raptors are present. The proposed action may have short term impacts on individuals but **would not likely result in the loss of viability of the population, nor cause a trend towards federal listing**. Outside nesting season, disturbance actions would be short-term and would likely move beyond a specific area within a matter of days based on the amount of danger trees present. These short-term impacts may result in some individuals moving outside the impact area during the duration of the disturbance. Disturbance from the proposed actions **may impact individuals, but is not likely to cause a trend towards federal listing or loss of species viability**.

Cumulative: Short-term human disturbances due to project activities may contribute to cumulative effects though they would not be substantial.

3.5.3.4 Harlequin Duck

Direct and Indirect: The proposed action **may impact habitat, and may impact individuals, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species**.

Disruption of females on nests could affect harlequin ducks. For this reason, there is a PDC seasonal restriction on activities during the nesting period of April 15 to June 20. There is a potential that females with young could be disturbed after that time, but, that disturbance is unlikely to lead to abandonment of young or clutch loss and may just temporarily displace ducks from the area where the treatments are occurring. Activities around culverts may have a short-term impact on sedimentation. However, in the long-term, habitat for harlequin duck could be improved as snags and non-danger tree fire-killed trees fall, increasing woody debris for nesting and brood rearing which could increase the number of nesting pairs in the area. This project also includes PDC to minimize sedimentation and water quality that may result from the proposed action.

Cumulative: Short-term human disturbances due to project activities may contribute to cumulative effects though they would not be substantial.

3.5.3.5 Fringed Myotis

Direct and Indirect: Proposed action activities would have **no impact** on hibernacula or mines since these habitats are not in the planning area. The short-term reduction in snags within the AOC may have potential to impact some roosting opportunities.

Therefore, this project **may impact individuals, but would not result in a loss of viability in the planning area, nor cause a trend toward federal listing.**

Cumulative: Short-term human disturbances due to project activities may contribute to cumulative effects though they would not be substantial.

3.5.3.6 Larch Salamander

Direct and Indirect: A portion of available habitat for this species may be impacted due to ground disturbance associated with proposed actions. Road decommissioning may result in the creation of additional habitat. The **project may have short term adverse on portions of available habitat but would not likely result in the loss of viability in the planning area, nor cause a trend towards federal listing.**

70-percent of all known federal occurrences within reserve lands including riparian reserves. The project **may have short term adverse impacts on some individuals but would not likely result in the loss of viability in the planning area, nor cause a trend towards federal listing.**

Cumulative: Short-term human disturbances due to project activities may contribute to cumulative effects though they would not be substantial.

3.5.3.7 Copes Giant Salamander

Activities from the proposed project would only impact Cope's giant salamander habitat where roads cross streams or run along streams potentially causing sedimentation. Culvert replacement may also cause short term increase in sedimentation. For some road closures, removal of culverts may occur which could result in a long-term improvement to habitat. Because of the project design criteria put in place for riparian areas, down wood and soil erosion, the **project may have short term adverse impacts on portions of available habitat but would not likely result in the loss of viability in the planning area, nor cause a trend towards federal listing.**

Sedimentation resulting from work in and near streams may have short-term impacts on individuals. Culverts may be replaced on some roads as a road maintenance activity. Because of the project design criteria put in place for riparian areas and soil erosion, the **project may have short term adverse impacts on some individuals but would not likely result in the loss of viability in the planning area, nor cause a trend towards federal listing.**

Cumulative: Short-term human disturbances due to project activities may contribute to cumulative effects though they would not be substantial.

3.5.3.8 Western Bumblebee

Direct and Indirect: The proposed action may impact western bumblebees by temporarily impacting recovering flowering plants during project activities. Reducing this food source would reduce the ability of foraging bumblebees to find nectar. It is expected that damaged plants would regenerate while other nearby nectar plants would

be available within the planning area. Danger tree cutting would enhance flowering plants in some areas in the long-term, resulting in beneficial long-term effects. The proposed action would result in site-specific disturbance, but the impacts of this project are expected to be short-term and only include the time period during which actions are occurring on the ground. Direct mortality of individuals could potentially occur during project implementation. The proposed action may impact current and potential nest sites with heavy equipment during project activities, temporarily reducing the number of nests and potential future nest sites and, therefore, reducing the number of bumblebees that this area could support. Nest sites would be expected to increase within a few years after treatment. **This project may have short term adverse impacts that adversely impact some individuals but would not likely result in the loss of viability in the planning area, nor cause a trend towards federal listing.**

Cumulative: Effects for this species were considered at the watershed scale since genetic diversity and connectivity between colonies is a concern for the bumblebee. Large scale ground disturbing activities such as wildfires alter landscapes and habitat required by bumblebees by removing flowering food sources, disturbing nest sites, and altering the vegetation community. The size of bumblebee populations diminishes, and inbreeding becomes more common as habitats become fragmented. This in turn decreases the genetic diversity and increases the risk of population decline. Cumulative effects from this project would not be substantial.

3.5.3.9 Mule Deer and Elk

Direct and Indirect: While some existing cover along the roads would be removed, available cover will remain within the AOC and the larger planning area. Less cover is likely to be available in areas where vegetative burn severity was high compared to areas of a lower to moderate burn severity. Areas with a high burn severity no longer currently provide adequate cover and are not likely to provide adequate cover in the long-term. In some areas, the fires created new summer forage habitat due to loss canopy coverage. Road closures and road decommissioning may result in additional habitat further reducing habitat fragmentation across the landscape. The proposed action could potentially disturb animals in the area at the time of implementation. Disturbance could temporarily displace animals and may potentially affect the health of individuals, especially if the disturbance occurs near calving sites. PDC will be implemented to minimize these effects in B11-Deer and Elk Summer Range management areas. Overall, the proposed action would result in short term impacts on individuals, but is not likely to result in additional habitat loss, and some long-term beneficial effects may occur.

Cumulative: Proposed treatments are not expected to result in additional loss of habitat for this species. Therefore, cumulative effects would be minimal and there may be some long-term beneficial effects. Impacts on individuals during disturbance actions will be short-term and would likely move beyond a specific area within a matter of days based on the amount of danger trees present. These short-term impacts may result in some individuals moving outside the impact area during the duration of the disturbance. Therefore, cumulative effects would be minimal.

3.5.3.10 Pileated Woodpecker

Direct and Indirect: In the short term the proposed action may decrease habitat quality within the AOC, but this species utilizes a home range that encompasses a larger

landscape level. At this level, within remaining post-fire pileated woodpecker habitat, snags and down wood would be abundant as a result of the fires. The proposed project may impact individuals due to noise and presence of people during treatment, but is not likely to result in additional habitat loss. Impacts would be short term. PDC will be implemented to minimize these effects during nesting season.

Cumulative: The species utilizes a larger spatial area than the linear segments comprising the AOC. Due to the larger scale impact of the fires, snags and down wood will be abundant in remaining habitat affected by fire which would help offset the loss of the snag and down wood within the AOC. At the broader spatial scale used by this species snags will remain available for use by pileated woodpeckers outside the linear AOC treatment acres. Short-term impacts may result in some individuals moving outside the impact area during the duration of the disturbance. Therefore, cumulative effects to the species and their habitat would be minimal.

3.5.3.11 American Marten

Direct and Indirect: Removal of large-diameter trees, down woody material, and canopy eliminates nest and roost sites for this predator's foraging habitat, and protective cover. Forest fragmentation likely reduces population density and makes martens more vulnerable to predation as they move between forest fragments. Activities that reduce the number of snags, logs, and cover may reduce the ability of an area to support this species.

The proposed project may have short term impacts on individuals, due to noise and presence of people during project activities but is not likely to result in additional habitat loss.

Cumulative: This species utilizes a larger spatial area than the linear segments comprising the AOC. Due to the larger scale impact of the fires, snags and down wood will be abundant in remaining habitat affected by fire which would help offset the loss of the snag and down wood within the AOC. Short-term impacts may result in some individuals moving outside the impact area during the duration of the disturbance. While removal of danger trees may lessen overhead coverage in some linear patches, at the broader scale overhead coverage will remain unchanged from this proposed action. Therefore, cumulative effects would be minimal.

3.5.3.12 Neotropical Migratory Birds

Direct and Indirect: Green trees removal is not included within the proposed action. The proposed action would result in the removal of dead and dying trees from within the AOC (i.e., within striking distance of the road). Dead and dying trees will be available throughout the larger planning area. These remaining trees will continue to provide habitat for cavity nesting birds. Therefore, the proposed action would have a very minimal effect to migratory birds.

Cumulative: Cumulative effects as a result of the proposed action and other reasonably foreseeable actions, would be minimal.

3.5.3.13 Snags and Down Wood

The AOC makes up is 6 percent of the total footprint (124,790 acres) of the fires. The number of snags per acre removed as a result of the proposed action were calculated and provided in Table 26 and Table 27 . These calculations provide an estimated range of snags per acre remaining within the AOC after implementation of the proposed action, within each basal area mortality class.

Table 26. Estimated snags per acre greater than 10-inches DBH within each basal area mortality class as a result of fire and implementation of the proposed action. This does not include snags which may have already existed within the AOC.

Percent basal area mortality class	Acres within AOC	Existing condition snags remaining with no action	Snags removed under proposed action	Estimated snags remaining after implementation
0 to 25	3,400	Up to 16	Up to 13	Up to 3
25 to 50	826	15 to 30	11 to 23	4 to 7
50 to 75	1,058	33 to 49	25 to 37	8 to 12
75 to 100	1,912	52 to 70	38 to 50	14 to 20

Table 27. Snags per acre greater than 20-inches DBH within each basal area mortality class as a result of fire. This does not include snags which may have already existed within the AOC.

Percent basal area mortality class	Existing condition snags remaining with no action	Snags removed under proposed action	Estimated snags remaining after implementation
0 to 25	Up to 8	Up to 7 snags	Up to 1
25 to 50	7 to 13	6 to 11	1 to 3
50 to 75	15 to 22	12 to 18	3 to 4
75 to 100	21 to 28	17 to 22	4 to 6

Due to the fires, downed wood levels are estimated to meet or exceed the historic range of variability at the fifth-field watershed scale for the planning area. However, proposed actions would reduce the amount of downed wood adjacent to the roads. Logs existing on the forest floor prior to implementation would be retained to the extent practicable. The effect of the proposed action on available snags and down wood is minimal due to the mosaic nature of danger tree removal within the AOC, and the abundance of available snags and down wood at the landscape level.

Cumulative: Due to the amount fire damage across the landscape, both within and outside the AOC, these areas would continue to meet and/or exceed historic down wood volume in the years to come. Cumulative effects from this project and other ongoing and reasonably foreseeable projects would be minimal.

3.5.3.14 Region 6 Sensitive Mollusks

Direct and indirect effects are similar for the group of species listed in section 3.5.1.14 Region 6 Sensitive Mollusks. As such the following effect determination is applied at the group level.

While this project proposed to cut roadside danger trees (and remove some), when viewed across the larger, non-linear, landscape, potential habitat with down wood would be available. As the Forest regenerates and fire-killed trees provide more down wood, habitats will begin to recover. Leaf litter removal resulting from the proposed action could result in direct or indirect mortality of individuals during project activities. While there may be an impact to woody debris and leaf litter along the roadside within the

AOC, both would still be available within the larger project area. These mollusk species prefer moist habitats and are more likely to be found in interior wooded areas or near riparian areas away from roads edges that receive regular sunlight. Riparian and down wood PDC help protect individuals and provide continued long-term habitat for these species. Danger tree removal **may impact some individuals and habitat, but would not likely result in a loss of viability in the planning area, nor cause as trend toward federal listing.**

Road decommissioning may result in the creation of additional habitat for some of these species and **may impact some individuals and habitat but would not likely result in a loss of viability in the planning area, nor cause as trend toward federal listing.**

Cumulative: The higher the burn severity, the less likely that area provides suitable habitat for the species or that individuals survived and/or are present. These species are poor dispersers due to their size and tend to have small habitat requirements. Pockets of small populations of may still be found within areas of remaining suitable habitat surrounded by areas of high burn severity. The proposed action's cumulative effects of impacts to these species and remaining habitat would be minimal.

3.5.4 Forest Plan Consistency

Survey and Manage: Cutting and leaving (or removing) dead and dying trees along roads is not considered a habitat disturbing activity for Survey and Manage species. The proposed danger tree removal is not likely to have a significant negative impact on the survey and manage species habitat. The proposed action is to treat dead and dying danger trees within striking distance of the road. Those trees occur with a higher frequency within areas of a higher burn severity and a higher burn severity decreases the likelihood that the area still meets habitat requirements for a species. In areas with higher quality habitat remaining, fewer danger trees would be removed. Trees that would be removed are only those within striking distance of the road, reducing the impact to the treated area and not resulting in a large enough scope to warrant surveys. This would result in a mosaic treatment pattern across the landscape. Therefore, the surveys are not needed, and were not completed for this project, to address Survey and Manage wildlife species.

Table 28 describes the project's consistency with the Forest Plan for wildlife resources.

Table 28. Threatened and endangered wildlife species consistency with management direction.

Element	Rationale
Forest Plan FW-170 and FW-171	The Forest Service worked with FWS and BLM to review the proposed action and ensure FWS concurrence.
Forest Plan FW-174	Habitat for threatened, endangered, and sensitive species has been identified and managed in accordance with the ESA (1973), the Oregon ESA (1987), and FSM 2670.
Forest Plan FW-175	Habitat for threatened, endangered and sensitive species has been protected in accordance with the MHNH Forest Plan Management Direction because recommendations of the recovery plan have been followed and consultation is completed.
Forest Plan FW-176	A Biological Evaluation has been prepared.

Element	Rationale
Forest Plan FW-177 and FW-178	The proposed action was consulted on under the formal programmatic: Biological Opinion on Mt. Hood National Forest Timber Harvest and Routine Activities (USFWS 20, Ref # 01EOFW00-2020-F-0169) and the Biological Assessment For Routine Land Management Activities with a Potential to Modify Habitat which are Not Likely to Adversely Affect Federally Listed Species within the Willamette Planning Province of Oregon (2018). Variance requests for the previous roadside danger tree analysis was submitted to FWS, reviewed by the Level 1 team and approved and signed by FWS. A second variance request for this project will be submitted.
Northwest Forest Plan LSR standards	Known spotted owl activity centers. One hundred acres of the best spotted owl habitat would be retained as close to the nest site or owl activity center as possible for all known spotted owl activity centers (as of January 1, 1994) located on federal lands.
Northwest Forest Plan LSR standards	There is no harvest allowed in stands over 80 years old.
Revised Recovery Plan for NSO: RA 10	The fires resulted in the need for the proposed action. The proposed action would only remove dead and dying (not 'green') trees and PDC are in place to ensure snags and downwood are maintained within the treated areas. Additionally, there will be more abundant snags and down wood available in the larger 'non-linear' habitat outside the AOC. Removal of the danger trees is not expected to result in additional loss of canopy cover then what would occurred naturally due to impact resulting from the fires.
Revised Recovery Plan for NSO: RA 32	This proposed action is to treat roadsides impacted by fire. Only dead and dying (not 'green') trees that are within striking distance of the road are proposed to be removed. Actions would not result in additional loss of canopy that would not have occurred eventually due to impacts from the fires. PDC are included that address snag and down wood retention. Closure and decommissioning of some roads may help reduce fragmentation.

3.6 Hydrology

3.6.1 Existing Condition

In the absence of taking action, the existing condition as described would be expected to persist. Changes over time would occur as a result of natural vegetative recovery and natural post-fire processes.

Water Quantity: Many of the subwatersheds model both peak streamflow increases greater than 10% based on wildfire impacts and are above the threshold where increases in peak streamflows are detectable. This is primarily found in areas that have high and moderate soil burn severity and vegetation loss that is also reflected in the Aggregate Recovery Percentage (ARP)²⁶. Cub Creek, Three Lynx Creek-Clackamas River, and Upper Clear Creek show increases in peak streamflows associated with wildfire impacts

²⁶ The ARP model was used to represent the proportion of a watershed in a "hydrologically mature" condition. By measuring the percent of an area in a hydrologically recovered condition, the ARP model evaluates the risk of increased peak flows from rain-on-snow events.

greater than 10% and are above the threshold of concern for increases in stream drainage network extension associated with the road network.

Sediment: Widespread soil erosion as well as ash and sediment deposition are expected throughout and downstream of the burned area as a result of the fires. These processes would diminish over time and should recover to pre-fire conditions over the next several years, with the greatest impacts occurring within the few years post-fire.

Sediment yields for the burned areas (see Table 29) were estimated by the Burned Area Emergency Response (BAER) teams for the Riverside, Lionshead and Bull Complex fires in association with TerrainWorks²⁷, measuring the potential wildfire effects on water quality in municipal watersheds of western Oregon and Washington.

When the sediment yield from the existing road system (see Table 30) is compared to the sediment yield modeled post fire all of the subwatersheds (except the North Fork Clackamas River and Pot Creek-Clackamas River) estimates are at or below 0.5% of the modeled post fire sediment yield. The North Fork Clackamas River is 4.1% of the modeled post fire sediment yield and Pot Creek-Clackamas River is 1.8%.

Table 29. Existing condition post-fire sediment yield predictions by subwatershed (HUC12).

Subwatershed	Total Sediment Yield (tons per year)	Tons per acre
Cot Creek-Oat Grove Fork Clackamas River	198,394	14
Cub Creek	39,369	3
East Fork Collawash River	35,865	3
Fish Creek	794,524	27
Happy Creek-Collawash River	23,593	2
Headwaters Clackamas River	21,821	<1
Helion Creek-Clackamas River	242,615	21
Lowe Creek-Clackamas River	7,720	<1
North Fork Breitenbush River	94,278	6
North Fork Clackamas River	8,846	<1
Pot Creek-Clackamas River	4,021	<1
Roaring River	153,648	6
South Fork Clackamas River	381,946	22
Three Lynx Creek-Clackamas River	664,003	21
Upper Clear Creek	226,877	19
Upper Mill Creek	124,010	5

Table 30. Existing conditions sediment yield for the existing road system by subwatershed (HUC12).

Subwatershed	Sediment Delivery (tons per year)
Cot Creek-Oat Grove Fork Clackamas River	57
Cub Creek	45

²⁷ The TerrainWorks data was used when available as sediment yields could be determined at the subwatershed scale from this dataset where subwatershed yields were not always available from the BAER team reports. Where TerrainWorks data was not available estimates from the BAER teams were used.

Subwatershed	Sediment Delivery (tons per year)
East Fork Collawash River	14
Fish Creek	31
Happy Creek-Collawash River	18
Headwaters Clackamas River	110
Helion Creek-Clackamas River	86
Lowe Creek-Clackamas River	28
North Fork Breitenbush River	100
North Fork Clackamas River	359 ²⁸
Pot Creek-Clackamas River	74
Roaring River	36
South Fork Clackamas River	31
Three Lynx Creek-Clackamas River	97
Upper Clear Creek	330
Upper Mill Creek	17

Stream Temperature: The fires (depending on burn severity) altered riparian vegetation and stream shade, resulting in stream temperature increases for many stream reaches, and minimal to no changes for other stream reaches. The duration and occurrence of fire-resultant stream temperature increases are variable. Recovery from fire-related stream temperature increases could take a few years for some streams and decades for others depending on the reestablishment of vegetation. Table 31 and Table 32 display the modeled existing condition for stream temperature increases as a result of the fires for subwatersheds within the planning area.

Table 31. Existing condition stream temperature increase and associated RAVG classes.

RAVG Class	Canopy Closure (CC) Mortality	Modeled Increase in Temperature °C (August mean stream temperature)
0	0% outside perimeter (OP)	0
1	0%	0
2	0% to 25%	0 to 0.38
3	25% to 50%	0.38 to 0.76
4	50% to 75%	0.76 to 1.14
5	75% and greater	1.14 to 1.52

Table 32. Existing condition percent of the NorWeST stream network within a subwatershed (HUC 12) by estimated stream temperature increase class.

Subwatershed	Not Mapped	0-OP	0	0 -0.38	0.38 - 0.76	0.76 - 1.14	1.14 - 1.52
Cot Creek-Oat Grove Fork Clackamas River	0%	72%	11%	14%	3%	0%	0%
Cub Creek	3%	65%	10%	8%	0%	0%	15%

²⁸ Sediment for this area was estimated for the North Clackamas Integrated Resource Project Water Quality Specialist Report.

Subwatershed	Not Mapped	0-OP	0	0 -0.38	0.38 - 0.76	0.76 - 1.14	1.14 - 1.52
East Fork Collawash River	0%	58%	33%	3%	3%	0%	3%
Elk Lake Creek	0%	17%	58%	8%	4%	2%	10%
Farm Creek-Collawash River	0%	96%	4%	0%	0%	0%	0%
Fish Creek	1%	9%	18%	13%	8%	13%	38%
Happy Creek-Collawash River	0%	87%	12%	2%	0%	0%	0%
Headwaters Clackamas River	5%	81%	4%	3%	1%	0%	5%
Helion Creek-Clackamas River	18%	5%	14%	23%	23%	0%	18%
Lowe Creek-Clackamas River	0%	98%	2%	0%	0%	0%	0%
North Fork Breitenbush River	8%	0%	41%	14%	7%	10%	20%
North Fork Clackamas River	0%	98%	2%	0%	0%	0%	0%
Pot Creek-Clackamas River	0%	100%	0%	0%	0%	0%	0%
Roaring River	0%	91%	4%	4%	0%	2%	0%
South Fork Clackamas River	3%	0%	33%	8%	5%	10%	43%
Three Lynx Creek-Clackamas River	0%	6%	31%	25%	4%	12%	21%
Upper Clear Creek	0%	26%	30%	19%	11%	7%	7%
Upper Mill Creek	15%	18%	10%	10%	4%	3%	40%

Category 5 Water Quality Limited 303(d) Streams: Within the project area the following standards apply for stream temperature (Oregon Administrative Rule (OAR) 340-041-0028 Temperature):

- 13.0°C during times and at locations of salmon and steelhead spawning.
- 16.0°C during times and at locations of core cold water habitat identification.
- 18.0°C during times and at locations of salmon and trout rearing and migration.

The section of the Clackamas River from Cub Creek to the Collawash River is listed for biocriteria. As a result of the fires, this section of the Clackamas River is modeled to have 68,910 tons of sediment delivery per year and increased stream temperatures associated with streamflow coming in from Cub Creek. The increased sediment delivery and stream temperatures as a result of the fires would be expected to cause detrimental changes in the resident biological communities that are used to assess the biocriteria standard.

Table 33. 303(d) Category 5 streams within the planning area.

Stream or Waterbody	Area Listed	Criteria
Clackamas River	Cub Creek to Collawash River	BioCriteria

Stream or Waterbody	Area Listed	Criteria
Clackamas River	Collawash River to Oak Grove Fork Clackamas River	Temperature- Spawning
Clackamas River	Collawash River to Oak Grove Fork Clackamas River	Temperature- Year-Round
Clackamas River	Oak Grove Fork Clackamas River to North Fork Reservoir	Temperature- Spawning
Clackamas River	Oak Grove Fork Clackamas River to North Fork Reservoir	Temperature- Year-Round
Collawash River	Nohorn Creek to confluence with Clackamas River	Temperature- Spawning
Collawash River	Nohorn Creek to confluence with Clackamas River	Temperature- Year-Round
Collawash River	East Fork Collawash River to Hot Springs Fork	Temperature- Year-Round
Fish Creek	Tweed Creek to Wash Creek	Temperature- Year-Round
Fish Creek	Wash Creek to confluence with Clackamas River	Temperature- Spawning
Fish Creek	Wash Creek to confluence with Clackamas River	Temperature- Year-Round
Hot Springs Fork	Whetstone Creek to Nohorn Creek	BioCriteria
Nohorn Creek	Headwater WA Unit to confluence with Hot Springs Fork	Temperature- Spawning
Nohorn Creek	Headwater WA Unit to confluence with Hot Springs Fork	Temperature- Year-Round
N.F. Clackamas River	Boyer Creek to confluence with North Fork Reservoir	Temperature- Year-Round
North Fork Reservoir	Lake/Reservoir Unit	Harmful Algal Blooms

3.6.2 Effects Summary

The analysis details that the proposed action complies with direction in the Forest Plan, as amended, and that actions provide appropriate protection of water quantity and quality. Site-specific PDC were developed for control of nonpoint source pollution. Cumulative effects were found to be minimal.

The direct and indirect effects of the proposed action conclude:

- There would be no impacts to peak streamflow as the resource indicators assessed (percent increase in peak streamflows associated with wildfire impacts, ARP, and road drainage stream network extension) did not indicate any additional increases in peak streamflows.
- Widely scattered and small amounts of sediment would be delivered to the stream system during project activities. Road decommissioning and closure activities would result in slight reductions in sediment yield in the long term for some subwatersheds. These changes would not be detectable at the cumulative effects analysis area scale.
- Danger tree removal has the potential to raise average and maximum stream temperatures for short reaches of streams where they are within the AOC. Any

widely scattered small increases in stream temperature would not be detectable at cumulative effects analysis area scale.

- Elements of the proposed action have the potential to affect water. Some actions such as road decommissioning and road closure are designed to improve water quality and to restore in-stream flows to protect the timing, magnitude, duration, and spatial distribution of peak, high, and low flows.
- Due to the fires, the existing condition is not in alignment with the desired conditions expressed by direction in the Mt. Hood National Forest Land and Resource Plan (Forest Plan) (USDA 1990) or the State or Oregon Water Quality Standards. The areas where danger tree treatments are planned under the proposed action are considered hydrologically disturbed and watershed impact areas due to fire impacts under the current post-fire and pre-treatment condition. The Danger tree treatments planned under the proposed action would not increase the watershed impact areas as these areas are already impacted. The project has been carefully designed and would not measurably further degrade the conditions. The Forest will be developing plans to accelerate hydrologic recovery. Planned post-fire reforestation will accelerate hydrologic recovery by promoting forest stand growth.
- Some streams in the project area are on the Category 5 Water quality limited, 303(d) list, Total Maximum Daily Load (TMDL) needed in Oregon's 2018 Water Quality Report and List of Water Quality Limited Waters. The criteria for streams in the project area that are identified as category 5 include: biocriteria, stream temperature (year-round and spawning criteria), and harmful algal blooms. The effects of the proposed action to 303(d) streams would be minimal with the application of site specific PDC, and Best Management Practices (BMPs). Fire-related increases in peak streamflows, sediment yield and stream temperature are expected to exacerbate conditions associated with the category 5 listings. The proposed action would have scattered and short-duration effects to sediment yield resulting in minimal impacts.

3.6.3 Direct Indirect Cumulative Effects

3.6.3.1 Direct and Indirect

A summary of the proposed action elements within each subwatershed is provided in Table 34. Overall, roadside danger tree cutting (the acres of AOC) within the subwatersheds accounts for two percent of the total subwatershed acres associated with the planning area.

Table 34. Proposed action summary by subwatershed.

Subwatershed	Subwatershed Acres	AOC Acres	Percentage of AOC within Subwatershed	Decommissioning Miles	Change to ML 1 Miles
Cot Creek-Oat Grove Fork Clackamas River	14,171	632	4%		<1
Cub Creek	14,883	566	4%		<1
East Fork Collawash River	10,395	363	3%		<1
Fish Creek	29,807	726	2%	<1	11
Happy Creek-Collawash River	14,533	15	0.1%		2
Headwaters Clackamas River	25,985	235	1%		

Subwatershed	Subwatershed Acres	AOC Acres	Percentage of AOC within Subwatershed	Decommissioning Miles	Change to ML 1 Miles
Helion Creek-Clackamas River	11,720	292	2%	<1	
Lowe Creek-Clackamas River	19,730	153	1%		
North Fork Breitenbush River	16,255	309	2%		
North Fork Clackamas River	20,638	98	0.4%		
Pot Creek-Clackamas River	22,961	41	0.2%		
Roaring River	27,309	49	0.2%	5	
South Fork Clackamas River	17,656	1,431	8%		4
Three Lynx Creek-Clackamas River	31,546	2,190	7%	4	8
Upper Clear Creek	12,247	272	2%		
Upper Mill Creek	26,528	135	1%		

Water Quantity: The proposed action cuts fire-killed and fire-damaged trees that are within striking distance of roads and closes and decommissions roads. The standing fire-killed, and fire-damaged trees have an already decreased canopy snow interception, thereby increasing snow accumulation on the ground. It is assumed that the cutting of these trees that already have decreased canopy snow interception would not further measurably change snow accumulation on the ground. The fire killed and fire damaged trees in the project area will no longer contribute burned woody debris to the snowpack surface because many will be left on the ground after they are cut. They would become covered with snow reducing the impact on snowmelt. The AOC is considered part of an already hydrologically disturbed and watershed impact areas due to fire impacts under the current post-fire and pre-treatment condition. Danger tree cutting would not further degrade or increase the watershed impact areas as these areas are already impacted from the fires. In consideration of the existing condition and the application of BMPs and PDC, the effect of the proposed action on available water quantity is minimal.

Sediment: The stream protection buffers listed in the PDC document are expected to be effective at protecting adjacent stream courses from sediment associated with harvest activities. Outside of buffers, yarding cut danger trees is likely to disturb soils and increase the delivery of sediment into road ditches that empty into streams, particularly in areas where more than a few logs are removed. Decompacting the road surface during decommissioning or rehabilitation activities loosens the soil, thus making it more likely to be mobilized during the first significant run-off period unless the road is on relatively flat terrain, not near streams, or sufficient ground cover (mulch, woody debris, etc.) is provided. Since there is culvert removal associated with the proposed decommissioning and rehabilitation activities there is the potential to deliver sediment into stream channels during project implementation. Road obliterations near streams would have short-term, construction-related effects. These projects may cause a short-term impact to water quality due to sediment input and turbidity. Streambank condition and habitat substrate may also be adversely affected. This would be a short-term effect since turbid conditions would dissipate soon after the in-stream work phase was completed, generally in a few hours. However, with careful project design with soil and water protection PDC such as erosion control, these effects are expected to be of a limited extent and duration.

Stream Temperature: The likelihood of affecting shade and water temperatures by felling hazard trees at a given site is dependent on proximity of the road to the stream and the number of trees that are removed. Project-specific PDC are in place to minimize impacts to stream shade. There is a high density of stream channels within the planning area and typically a perpendicular association between streams and the AOC along roads (rather than a parallel one; along entire stream reaches) which further minimizes impacts to stream temperatures.

Named streams that have over 1,000 continuous feet in the project area were assumed to run parallel to the road and were assessed to see how much of the area would be impacted by danger tree cutting. Clackamas River, Ogre Creek, and Station Creek all have over 90% of the continuous stream length with less than 10% basal area loss (John Creek has 81% of the stream length in the class) indicating the implementation of the proposed action would have limited impact on stream shade in these areas. All of the streams²⁹ other than Fish Creek and Rimrock Creek have greater than 50% of area with less than 50% basal area loss indicating that post fire there is some shade remaining. Where the danger tree removal is occurring adjacent to Fish Creek there is a specific PDC in place to ensure that standing dead trees that are not imminent or likely hazard trees would remain so that they can provide shade. In this case small branches and some needles remain that are providing overhead shade as shown in Figure 7. The imminent or likely hazard trees would not be providing shade because they would have fallen and are laying on the ground as they have a high probability of failure within 5 years.

²⁹ Bull Creek, Clackamas River, Fish Creek, John Creek, North Fork Breitenbush, Oak Grove Fork Clack, Ogre Creek, Rimrock Creek, Sandstone Creek, Station Creek, Whale Creek.

Figure 7. Tree canopy at the Fish Creek USGS gaging station.



The post-fire stream temperature analysis for Rimrock Creek indicated increases to August mean stream temperature of 1.14 to 1.52 °C which is the maximum modeled increase. Implementation of the proposed action is expected to have minimal impacts in this area.

The proposed action has the potential to raise average and maximum stream temperatures for short reaches of streams scattered across the project area. Near-stream vegetation would recover quickly. At which time, stream shade on these smaller streams would no longer see higher stream temperatures associated with stream shade reductions.

There would be slight increases in temperature and sediment yield associated with the proposed action along with some reduction in sediment yield associated with the road decommissioning and road closures. These slight increases should not result in any additional impacts to the listed criteria of temperature, biocriteria, and harmful algal blooms beyond those described in the existing condition.

3.6.3.2 Cumulative

Modeled impacts of the Bull Complex, Lionshead and Riverside fires detail 2,626,548 tons of sediment delivered annually to the stream system. Implementation of the proposed action has the potential for widely scattered and small amounts of sediment to be delivered to the stream system in the short term. Road decommissioning and closure activities would result in slight reductions in sediment yield in some subwatersheds. These changes would not be detectable at the cumulative effects analysis area scale.

Activities assessed as relevant to cumulative effects³⁰ have the potential for widely scattered and small amounts of sediment to be delivered to the stream system. While there is cumulative potential to raise average and maximum stream temperatures for short reaches of streams and increase some scattered and short-duration sediment delivery these minimal increases would not be detectable at cumulative effects analysis area scale.

3.6.4 Forest Plan Consistency

As defined in the Forest Plan: “Watershed impact areas” represent areas within watersheds which are being hydrologically disturbed by management activities (e.g., timber harvest and road construction) and/or natural disturbances (e.g., wildfire and landslides). An area is considered a watershed impact area when it is not vegetated equivalent to a coniferous forest with a crown closure of 70 percent and an average tree diameter at breast height of eight inches.

A Forest Plan Management Direction interpretation on watershed and hydrologic recovery Standards and Guidelines (S&Gs): FW-064, FW-065 and B6-020) from March 25, 1991 (USDA 1991) concluded: “Within a watershed that has exceeded the prescribed Threshold of Concern (TOC) or watershed impact area value, any activities which do not further degrade the watershed can occur without deviating from these S&Gs (i.e., FW-064, FW-065 and B6-020).” While this interpretation did not include S&Gs FW-061, FW-062, and FW-063 (it is assumed because the questions for interpretation were focused on Special Emphasis Watersheds) the same logic would apply with respect to activities which do not further degrade the watershed can occur without deviating from these S&Gs.

The areas where danger tree treatments are planned under the proposed action are considered hydrologically disturbed and watershed impact areas due to fire impacts under the current post-fire and pre-treatment condition. The danger tree treatments planned under the proposed action would not increase the watershed impact areas as these areas are already impacted due to fire impacts. Therefore, the proposed action is consistent with the Forest Plan for Watershed Impact Areas.

There are a number of Standards and Guidelines in the Forest Plan addressing water quality in Class I, II, and Fish Bearing Class III Streams³¹. As with cumulative watershed effects due to the fires, the existing condition is not in alignment with the desired conditions expressed by direction in the Forest Plan. However, the project has been carefully designed and would not measurably further degrade conditions with respect to stream temperature, turbidity or embeddedness, therefore is consistent with the Forest Plan.

³⁰ Post-fire recovery actions (repair, reforestation, restoration, and other danger tree cutting projects), ongoing aquatic restoration, hydro power operations, powerline corridor maintenance, ongoing timber sales and vegetation treatment, ongoing road, recreation, and administrative site maintenance, and off-highway vehicle recreation.

³¹ Class I - Perennial or intermittent streams that: provide a source of water for domestic use; are used by large numbers of fish for spawning, rearing or migration; and/or are major tributaries to other Class I streams. Class II - Perennial or intermittent streams that: are used by moderate though significant numbers of fish for spawning, rearing or migration; and/or may be tributaries to Class I streams or other Class II streams. Class III - All other perennial streams not meeting higher class criteria.

Wetlands and Floodplains: There are 11.3 acres of wetlands within the AOC. There are no wetlands identified in areas identified for road decommissioning or road closure. PDC are developed to ensure that wetlands are protected, in alignment with management direction. There are no jurisdictional floodplains within the AOC. Floodplains are limited and localized based on Rosgen stream types in the project area. PDC are developed to ensure these floodplains are protected, in alignment with management direction.

Clean Water Act: In compliance with the Clean Water Act, site-specific Water Quality Best Management Practices, with the express purpose of limiting non-point source water pollution, are incorporated into the proposed action as PDC. The Interdisciplinary Team has examined the applicable general National Core BMPs and developed more specific and prescriptive Project Design Criteria (PDCs) to implement the intent of the BMPs. Some of the PDCs are standard practices and others were tailored specifically for this project based on site-specific conditions.

3.7 Soil Productivity

Detrimental soil conditions (DSC), soil erosion hazard class, and amount of surface organic matter are the resource indicators used to measure the effects of the proposed action on soils.

3.7.1 Existing Condition

The AOC is comprised of a variety of soil types. Dominant soil types are listed by parent material in Table 35 describing their associated compaction hazards and surface erosion potential.

Table 35. Erosion potential and compaction hazard for the parent material soil types within the AOC.

Parent Material	Estimated Acres	Compaction Hazard	Soil Surface Erosion Potential	Percent Slope (%)	Estimated Percent of Treatment Areas
Pyroclastic Rock Formations	2,004	Moderate-High	Slight-Severe	0-60+	26
Igneous Rock Formations	232	Low	Severe-Very Severe	60-90	3
Glacial Deposits	4,495	Low-Moderate	Slight-Severe	0-60+	59
Alluvial Deposits	40	Low	Slight-Severe	0-10	<1

The parent material within the Lionshead and Bull Complex areas is primarily lava flows, basalts, glacial deposits, and weathered pyroclastic rock. The parent material within these fire areas results in a soil texture that is generally well draining (i.e., sandy loams, loams and silt loams). Within the Riverside fire area soils are derived from weathered pyroclastic and igneous rock formations. While silt loams and loams are a resultant soil texture from this parent material, the Riverside fire area also contains clay loams. In general, the soils within the Riverside fire area have a high capacity for holding moisture and are generally more susceptible to DSC and slope stability issues.

DSC: DSC are low across the planning area with nearly 85 percent of the AOC at less than 5 percent DSC. 15 percent of the AOC is within the 5-10 percent DSC range. There are no areas where treatment would occur within greater than 10 percent DSC. Pre-existing DSC is primarily a result of previous forest management activities that use ground-based systems, resulting in compaction (i.e., landings and skid trails).

Soil Erosion Hazard Class: Natural re-establishment of grasses, forbs, brush, tree regeneration, and reforestation after management activities has acted to effectively provide ground cover in previously managed areas. The Riverside, Lionshead, and Bull Complex Fires consumed much of the existing vegetative ground cover, leaving areas of bare soil. Even though wildfire resulted in an immediate lack of effective ground cover soil erosion rates have not been accelerated to a noteworthy degree for the long-term. Natural recovery was observed immediately post-fire suggesting the areas with low soil burn severity had minimal impacts to ground cover, soil structure, roots, porosity, and overall soil function. Areas with high soil burn severity had effective ground cover consumed and soil structure, roots, and porosity were lost. Overall, soil function was impacted in these areas as a result of the fires. Moderate and high soil burn severity results in a slower recovery of effected ground cover. Areas that are slower to recover include shallow and rocky soils, soils in higher elevations, and on soils found on steep slopes.

The greatest impacts to soil loss are most likely during the first two years following the initial burn. Erosion from storm events vary depending on vegetative recovery overtime and storm intensity. Erosion rates are expected to decline each year due to increases in effective ground cover. Natural recovery of ground cover within the West Cascades following fire is expected to be two-to-five years. The existing condition within the AOC where soil burn severity was moderate-to-high, and where recovery is slow, effective ground cover standards are not consistent with Forest Plan standard FW-025 for soil productivity.

Surface Organic Matter: A mostly contiguous layer of litter and duff covered the ground within the planning area prior to the fires. The fires burned at various intensities leaving a mosaic of remaining surface organic matter, resulting in a generally low level of available organic matter compared to pre-fire conditions. Soil burn severity was used to estimate the existing condition. Areas that burned with a low soil burn severity retained most of their surface organics, whereas areas that burned with a high soil burn severity resulted in the loss of litter and duff layers. The fires resulted in complete and partial consumption of coarse woody debris and killed a great number of trees throughout the planning area. Where soil burn severity was moderate-to-high, the existing condition within the AOC is not consistent with the Forest Plan standard FW-033 for coarse woody debris contributing to surface organic matter. Throughout the planning area coarse woody debris would steadily increase in the post-fire environment. The proposed action includes design criteria for down wood requirements within the AOC.

Overall, post-fire natural recovery is varied throughout the planning area based on a number of factors including moisture availability, the mosaic of soil burn severity, variable soil properties, and available seed banks.

3.7.2 Effects Summary

The project has been carefully designed and would not measurably further degrade the existing condition of soils and would not result in extensive long-term soil loss. Further, the amount of surface organic matter that would remain after implementation would be sufficient to support the function and recovery of soil biota, facilitating site productivity.

Impacts to soils are expected to occur in the short-term as a result of the proposed action, especially where ground-based equipment is used to cut and yard felled danger trees (skid trails, landings, cable yarding corridors). The potential for DSC within the AOC to reach the Forest Plan threshold of 15 percent is greatest where the existing condition is within 5-10 percent DSC. However, the application of BMPs and PDC limiting the extent of the ground disturbance would result in the reestablishment of effective ground cover, limit erosion potential and ultimately, the capable recovery of productive soils.

Road decommissioning and road closures would include storm proofing, improving drain features. Road surface entryways would be barricaded and hidden. Active decommissioning and rehabilitation activities associated with this road work would convert previously non-productive areas to productive status in the long-term allowing for re-vegetation of native plants on previously impacted surfaces. Soil quality in these areas would improve.

In the absence of implementing the proposed action, measurable increases of DSC within the AOC would not occur. Soil quality would remain degraded and long-term site productivity would be diminished where the existing condition of DSC persist. The consequence of which would indirectly reduce the rate of tree growth. Surface organic matter would increase over time due to windthrow, natural revegetation, and climatic conditions. Over time, trees would die and fall. These areas would eventually produce substantial quantities of small and large woody debris, which would be a source of future large and small decaying logs on the ground. Overtime, as bare areas become revegetated, erosion levels would decrease. If an existing slide were to become more active, or if new landslides were to occur, and increased level of soil erosion would be expected in the exposed soil areas. In the absence of road maintenance, road closing, and road decommissioning drainage control issues would go unrepaired and roads would continue to produce sediment.

3.7.3 Direct, Indirect, Cumulative Effects

3.7.3.1 Direct and Indirect

Where primary skid trails, landings, and yarding corridors are located upon fine-textured soils, effects from the compaction or displacement of topsoil are expected with slow recovery. However, the project has been carefully designed and would not measurably further degrade the DSC existing condition. Restoration of areas impacted by surface disturbing activities would be expected to occur within 1 year of project completion and would entail measures to hasten recovery of soil function. Rocky soils within the AOC are more resistant to compaction and expected to be somewhat resistant to additional ground disturbance. Rehabilitation of disturbed areas as a result of the proposed action would hasten soil recovery. Decommissioning roads would offset, to a degree, some DSC impacts expected as a result of the proposed action.

Mechanized logging equipment would impact existing, recovering vegetation and potentially increase erosion rates on bare soils. Soil erosion could be expected where soil surface would be compacted and displaced, such as primary skid trails, yarding corridors, landings, and any temporary roads created within a logging system. To diminish this risk while soils are exposed, erosion control PDC that limit the amount of soil exposure and re-establish ground cover are included in the proposed action. The potential for soil erosion would be greatest in areas with moderate-to-high soil burn severity and where exposure occurs on steep slopes. The recovery period for these areas would be prolonged compared to areas with gentle slope gradients and low soil burn severity. Natural recovery of bare areas would continue. Erosion rates would continue to decline each year, due to increases in effective ground cover. Overall, across all treatment areas, the proposed action is not expected to directly result in extensive long-term soil loss.

Surface organic material would be disturbed in treatment units as a result of mechanical operations. Organic matter would be removed and denuded primarily from within skid trails, portions of yarding corridors, landings, and temporary roads which would be implemented following PDC to limit soil-related impacts. Organic inputs are expected within the AOC through natural recovery, and the application of slash, mulch, or seed used for erosion control.

The cutting and removal of danger trees decreases the total on-site standing biomass within the treatment area in the near-term. Standing green trees and some cut danger trees will be left on site as stated in PDC H2 and B1-B5. Blow down would also contribute to woody debris in the AOC over time. Woody debris existing on the ground prior to project implementation may be redistributed but would be left on site where possible (PDC H2.a).

After the project has been implemented, new growth of understory seedlings, brush and vegetation would occur and, over time, would generate litter-fall for the forest floor, contributing fine needles, small branches, and large limbs and stems. The total amount of surface organic matter to remain after treatment would be sufficient for supporting the function and recovery of soil biota that facilitate site productivity.

Road closure and road decommissioning projects would increase soil organic matter within roadbeds where coarse woody debris is placed in the road prism and where surfaces are decompacted and revegetated.

3.7.3.2 Cumulative

The cumulative effects of the proposed actions when combined with past, present, and foreseeable vegetation management actions would not be substantial. Soils is expected to remain productive, allowing trees and other vegetation to continue growing and developing.

Some of AOC includes areas that have been previously managed (prior to the fires). For this reason, the potential for cumulatively accruing DSC is likely. Treatment units that exhibit Soil Condition Class 2 would accrue DSC above 10 percent, but with the application of PDC and BMPs, would remain below the 15 percent threshold identified in the Forest Plan. Close coordination between contract administrators, specialists, and operators to implement BMPs/PDC would be needed to contain the extent of detrimental soil impacts. Further, decompaction of disturbed surfaces such as temporary roads,

landings, roads proposed from decommissioning, and some skid trails would hasten recovery of soil function. Reforestation (a present and reasonably foreseeable action) throughout the planning area and within portions of the AOC would also accelerate forest recovery.

Cutting and removing danger trees would result in a temporary reduction in effective ground cover within primary skid trails, landings, yarding corridors, and to a lesser extent on ground between primary skid trails. BMPs and PDC would minimize the cumulative nature of accelerated erosion because sufficient ground cover would be applied or retained to limit soil loss. Recovery of effective ground cover throughout the planning area and within portions of the AOC would continue to occur.

3.7.4 Forest Plan Consistency

With the application of PDC and BMPs during and after project implementation, the proposed action is consistent with the Forest Plan standards for soil productivity (FW-022 to FW-037). The proposed action was not found to result in exceeding the DSC threshold, therefore, a project-level Forest Plan amendment is not needed.

Some project activities occur within Wild and Scenic River corridors. Regarding soils interests, the Collawash River has outstandingly remarkable values for geology. The extent of the treatment within the Collawash Wild and Scenic River corridor is limited to closure of NFS road 6380130 and danger tree cutting along less than a half-mile of NFS road 6380000. Less than 2 percent of the entire earthflow feature within this corridor would be impacted by the proposed action. The overall characteristic and quality of the earthflow feature (geologic interests) would be maintained.

3.8 Fisheries

3.8.1 Existing Condition

Due to the wildfires, the existing condition of most riparian areas within the planning area are generally not in alignment with the desired conditions expressed by direction in the Forest Plan for General Riparian Area section B7. Fire altered the availability of riparian vegetation and stream shade along many streams.

3.8.2 Effects Summary

Federally listed threatened fish species and sensitive species are present in the watersheds affected by the fires. PDC have been developed and are consistent with Forest Standards and Guidelines and with the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) biological opinion for Routine Actions and Maintenance Activities (RAMBO) signed March 26, 2018. PDC would greatly minimize potential effects, but not eliminate them altogether. In terms of sensitive species, the proposed action **may impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or loss of viability to the population or species**. The project complies with ESA and there would be no direct or indirect effect to steelhead trout, Chinook or coho salmon or their designated critical habitat because there is no in-water work included in the proposed action; therefore, consultation with regulatory agencies is not required. The proposed action is **not likely to adversely affect** listed fish. Effects determinations are further summarized in Table 36 and Table 37.

While there is the potential to raise the average and maximum stream temperatures for short reaches, the widely scattered small increases would not be detectable at the watershed or cumulative effects analysis scale. Therefore, potential affects to stream temperature were found to be unmeasurable and unsubstantial from a fisheries perspective. Quantities of large woody debris in streams and Riparian Reserves will increase over time throughout the burned area as fire-affected and dead trees fall. Any direct effects on fisheries would be expected to mimic post-wildfire woody debris recruitment with natural levels of sediment. Effects would be short term and of low magnitude. RAMBO has been reviewed and project specific PDC have been developed in alignment with RAMBO which address shade within Riparian Reserves within the AOC.

Table 36. Fisheries effects summary federally listed species.

Species	Habitat Description	Summary of potential effects from proposed action on species or habitat	Effect Determination ³²
Upper Willamette River (UWR) Chinook Salmon <i>Oncorhynchus tshawytscha</i> Lower Columbia River (LCR) Coho Salmon <i>Oncorhynchus kisutch</i> LCR Steelhead <i>Oncorhynchus mykiss</i>	Federally Listed Species and the Regional Forester's Sensitive Species can be or has the potential to be found throughout the following streams adjacent to section (in miles) of road and riparian reserves intersections within 1 mile of Listed Fish Habitat:	Due to the relatively same habitat requirements for listed species and the Regional Forester's Sensitive Species the potential effects from the proposed action are also alike. Information from the Riverside Fire Burned Area Emergency Response (BAER) fish report states that in the short-term (0-5 years), post-fire effects are likely to increase sediment, water temperatures, and woody debris to listed fish habitat (LFH), especially in Fish Creek, South Fork Clackamas River, and the mainstem Clackamas River naturally due to the wildfire, not the proposed action. The proposed action while near LFH would not include in-water work therefore direct disturbance would not be likely to occur. Listed-fish populations still can utilize portions of the watershed that did not burn, or burned at lower intensities, that will provide a refuge until vegetation recovers along and within the AOC. These refuge areas include the Collawash and Oak Grove Fork of the Clackamas River. Although there would likely be short-term impacts, anadromous fish populations in the Clackamas River are expected to endure, and in time should recover to pre-fire conditions in the long-term (5-50 years). Because there would be low and not measurable amounts of fine sediment and turbidity introduced to aquatic habitat in the project area as a result of tree abatement activities, there would be little impact on habitat conditions or aquatic fauna. Potential impacts would only occur at the site scale, would be undetectable, and would last only a few minutes.	NLAA

Table 37. Fisheries effects summary for Regional Forester's Sensitive Species.

³² NE: No Effect. NLAA: May affect, but not likely to adversely affect. LAA: May affect, and is likely to adversely affect

Species	Habitat Description	Summary of potential effects from proposed action on species or habitat	Effect Determination³³
Pacific Lamprey	See Table 36 habitat description.	See Table 36 summary.	MIIH
Rocky Mountain Duskysnail ³⁴	Habitat requirements for this species are cold, well oxygenated springs, seeps, and small streams, preferring areas without aquatic macrophytes (Furnish and Monthey 1998). There may be suitable habitat present within the project area although none have been identified on record; however, they are therefore assumed to be present.	See Table 36 summary.	MIIH
Basalt Juga ³⁵	Habitat requirements for this species are similar to that of the Rocky Mountain Duskysnail (Furnish and Monthey 1998). Since this watershed is close to known populations and suitable habitat is present, they are assumed to be present.	See Table 36 summary.	MIIH

3.8.3 Direct, Indirect, Cumulative Effects

3.8.3.1 Direct and Indirect

The proposed action would result in small-scale, short duration negative direct effects to in-stream aquatic resources. An individual fish or aquatic organism may be impacted but not in a manner that would affect decline in populations or result in a change of listing status. PDC are in place to minimize sediment delivery to the stream systems within in the AOC.

Beneficial indirect effects for aquatic restoration would also occur. Trees felled within riparian reserves will be left in place to provide refuge habit for aquatic organisms, nutrients for the soil from vegetation decay, and potential in-stream benefits in the event that high-water flows occur to move large woody debris (LWD). Some cut trees (outside of the riparian reserves) would be removed and allocated to aquatic restoration projects planned throughout the forest. These logs will aid in increasing LWD throughout the District's stream system. LWD would also benefit partner organizations in their habitat restoration efforts.

³³ NI: No Impact. BI: Beneficial Impact. MIIH: May Impact Individuals or Habitat, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.

³⁴ The Rocky Mountain Duskysnail is listed as both a Region 6 Sensitive Species and as Survey and Manage Species under the Northwest Forest Plan (Forest Service et al. 2001).

³⁵ The Basalt Juga is listed as a Survey and Manage Species under the Northwest Forest Plan and is not a Sensitive Species. However, the determination of effect of this project for this species is the same as for the other species analyzed

Negative indirect effects would be small in scale because they would only be present for the length of the stream reach that is within striking distance on either side of the road (i.e., within the AOC). In comparison to the entire reach of the stream this would impact a miniscule portion of fisheries habitat. Negative indirect effects would be minimized through the application of PDC.

3.8.3.2 Cumulative

Cumulatively both beneficial and negative effects from this project would be negligible due to compounding PDC for this project and others minimizing direct and indirect effects of project activities. Projects considered in this cumulative effects determination are the Cub Creek Watershed Restoration Action Plan projects (instream restoration, riparian restoration, road decommissioning), Clackamas River Hydroelectric Project Oak Grove Fork Restoration and large woody debris habitat construction, and Clackamas mainstem large woody debris planning. Previous large woody debris projects had short-term disturbances resulted in long-term refugia and spawning benefits within the stream.

3.8.4 Forest Plan Consistency

Aquatic Conservation Strategy and Riparian Reserves: Due to the fires, the existing condition for Riparian Reserves and watersheds is not in alignment with some of the desired conditions expressed by the Northwest Forest Plan. The existing condition is one of variable intensity fire that caused variable mortality. Riparian Reserves across the burned landscape have high levels of mortality in many stream reaches and in the coming years, trees will be falling into streams and Riparian Reserves in sufficient number to meet riparian objectives for downed wood. The project has been carefully designed, would not measurably further degrade resource conditions, and is therefore consistent with the Aquatic Conservation Strategy Objectives to maintain and restore.

Wild and Scenic Rivers: There is no planned in-water work for this project. Due to the protections provided by the PDC, there would be no fisheries related impacts to the outstandingly remarkable fisheries values within these river corridors. Outstandingly remarkable values would be protected.

Forest Plan: Project specific PDC and BMPs would be applied during implementation. Therefore, this project is consistent applicable fishery resource standards and guides.

3.9 Cultural Resources

3.9.1 Existing Condition

During the Bull Complex fire one historic resource was destroyed (Bull of the Woods Lookout) while the other 9 resources are not at risk of loss due to the fire or post-fire activities. The remaining sites are all within unburned or low burn areas which place them on a low to very low risk of integrity loss. The Riverside and Lionshead fire areas contain 57 previously documented archaeological sites (historic properties) and four isolates³⁶.

³⁶ A concentration of less than ten artifacts within a forty-meter circumference

3.9.2 Effects Summary

The proposed undertaking meets the criteria for Standard Case-By-Case Review by the Oregon State Historic Preservation Officer and the Advisory Council on Historic Preservation under terms of the 2004 Programmatic Agreement for a ***No Historic Properties Affected*** determination.

Project design criteria were developed to prevent, eliminate, or mitigate any adverse effect. The proposed action is expected to have no, or extremely minor, direct effects on all known cultural resources and areas of high archaeological potential within the project planning area as long as PDC are followed. The closure or decommissioning of roads reduces the potential for future impacts to heritage resources by enhancing their long-term stability and integrity. If no action is taken, the existing condition would persist, and over time have the potential to lead to direct, and indirect effects, particularly future wildfires impacting historic properties.

3.9.3 Direct, Indirect, Cumulative Effects

The proposed action is expected to have no, or extremely minor, direct effects on all known cultural resources within the planning area. In most cases, Heritage Resources considerations for eligible or unevaluated sites would be avoided or properly mitigated throughout the lifetime of any of the proposed actions.

The proposed action has the potential to cause direct effects on undiscovered cultural resources. This possibility however is limited by project design criteria that call for an immediate halt to project work and notification of a Forest Archaeologist should an inadvertent discovery of cultural resources be made. The cultural resource would be evaluated, and, if necessary, a mitigation plan would be developed in consultation with SHPO.

An indirect effect may occur from the closure or decommissioning of roads as proposed throughout all three fire areas. This would be beneficial in nature by reducing the potential for future impacts to archaeological and historic resources along those roads ultimately enhancing their long-term stability and integrity.

Cumulatively, because there would be no effects to historic properties, there are no cumulative impacts to historic properties. Undiscovered cultural resources, however, would be subject to minimal cumulative effects. These effects would be kept to a minimal scale due to the application of PDC if new sites are discovered during implementation.

3.9.4 Forest Plan Consistency

PDC have been developed and are included in the proposed action. These PDC ensure the project's consistency with Forest Plan management direction for historic and cultural resources as well as other regulatory frameworks including the National Historic Preservation Act, Archaeological Resources Protection Act, Native American Graves Protection and Repatriation Act, and Executive Order 13007 for Indian Sacred Sites.

3.10 Botany

3.10.1 Existing Condition

At least one occurrence of each of the botanical species of conservation concern listed in Table 38 has been documented within the AOC.

Table 38. Sensitive, survey and manage and state of Oregon botanical species within the Clackamas Fires Roadside Danger Tree area of consideration.

Scientific Name	Common Name	Taxon Group	R6 Sensitive Species	State	Survey and Manage Category ³⁷
<i>Bridgeoporus nobilissimus</i>	noble (giant) polypore	Fungus (polypore)	No	Yes	A
<i>Chroogomphus loculatus</i>	NA	Fungus (gilled)	No	Yes	B
<i>Corydalis aquae-gelidae</i>	cold water corydalis	Vascular Plant (herbaceous)	Yes	Yes	A
<i>Eucephalus gormanii</i>	Gorman's aster	Vascular Plant (herbaceous)	Yes	Yes	NA
<i>Pachycudonia monticola</i>	mountain-loving Cudonia	Fungus (club, earth tongue)	No	No	B
<i>Peltigera pacifica</i>	Pacific felt lichen	Lichen (foliose)	No	No	E

The fires removed or degraded habitats for sensitive botanical species, including vascular plants, bryophytes, lichens, and fungi, in areas with moderate and high tree mortality. The fires may also have destroyed known or undiscovered populations of botanical species.

The extent of damage to botanical resources has not been determined at this time. Botany field surveys from summer 2020 provide incomplete information on the forest characteristics in the area because of the Riverside fire. However, prior surveys of lichens and bryophytes in the Fish Creek Watershed report populations of species on the Survey and Manage and Oregon Biodiversity Information Center (ORBIC) lists. Vegetation visible from the road includes regrowth of herbaceous and woody plants, indicating early post-fire succession. Depending on the spatial extent and intensity of the fire, some areas have a vegetation composition with high species diversity and abundant downed woody debris, while soils in other areas have little to no organic layer. Areas of bare surface soil is likely becoming dominated by rapid colonizing forbs such as miner's lettuce, invasive geraniums, horsetails, and grasses, such as bromes and bluegrasses, interspersed with shrubs like red alder, thimbleberry, beaked hazelnut, and vine maple.

3.10.2 Effects Summary

The proposed action has no effect on any federally threatened, endangered, or proposed species because there are no documented threatened or endangered botanical species on the Forest.

³⁷ Categories apply only to Survey and Manage species. See the ROD (2001) for category definitions.

The impact of the proposed action *may affect individuals or their habitat but will not likely contribute to a trend towards federal listing or a loss of viability*. Physical damage from tree-felling operations and associated ground-disturbing actions using standard mechanized equipment may damage above ground parts as well as the substrate on which botanical species grow. Actions taking place adjacent to populations or occurring upstream from them may have indirect effects by changing microsite conditions. The cumulative effects of past actions, the current proposed action, and future proposed projects and other actions may have negative effects. However, efforts to restore the habitat after implementation and prevent invasive plants would have beneficial effects. The net outcome of cumulative impacts may affect individuals and isolated pockets of habitat in the short term, but the broader landscape is likely to improve in the long term.

Table 39. Summary of effects³⁸ for each species.

Scientific Name	Common Name	Taxon Group	No action	Proposed Action Effect
<i>Bridgeoporus nobilissimus</i>	noble (giant) polypore	Fungus (polypore)	NI	MIHH
<i>Chroogomphus loculatus</i>	NA	Fungus (gilled)	NI	MIHH
<i>Corydalis aquae-gelidae</i>	cold water corydalis	Vascular Plant (herbaceous)	NI	MIHH
<i>Eucephalus gormanii</i>	Gorman's aster	Vascular Plant (herbaceous)	NI	MIHH
<i>Pachycudonia monticola</i>	mountain-loving Cudonia	Fungus (club, earth tongue)	NI	MIHH
<i>Peltigera pacifica</i>	Pacific felt lichen	Lichen (foliose)	NI	MIHH

Impacts to identified species and their associated habitat would be minimized through implementing specific direction outlined in the PDC.

3.10.3 Direct, Indirect, Cumulative Effects

3.10.3.1 Direct and Indirect

Activities associated with the proposed action have direct and indirect impacts on species of concern. To avoid or lessen negative effects to species and their habitats, PDC will be followed. Direct effects to species are actions that physically damage the organism or its substrate causing mortality. Driving over a sensitive or other rare species with vehicles or heavy equipment would cause a direct negative effect. Likewise, during tree-felling operations, trees landing on a sensitive or other rare species or moving the felled tree on the ground would also cause a direct effect. Removing trees would have a direct effect on epiphytic lichens and fungi living inside the tree. The indirect effect on

³⁸ NI = No impact. The existing condition on the post-fire landscape continues to persist in the absence of implementing the proposed action. MIHH = May impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

species is habitat degradation, resulting from potential invasive species colonization, increased competition for resources, change in vegetation composition, reduced gene pool, loss of viability, changes in soil characteristics, and a change in hydrologic patterns.

Road closures proposed would result short-term negative direct effects and beneficial long-term indirect effects for some species. Restricting access into potential habitat would provide an undisturbed window of opportunity during the growing period for some species. Some closure and decommissioning practices such as “cratering” and storm proofing may have a short-term negative impacts at the time of implementation but would result in longer-term benefits from lack of disturbance opportunity.

3.10.3.2 Cumulative

The spatial consideration for cumulative effects includes all the proposed roads for removing danger trees including roads proposed for closure or decommissioning. The species considered in this analysis have habitats specific to the western Cascades and are limited in their distributions. The effects of past logging activities, silvicultural practices, and recreational use patterns contribute to current conditions for these species in some areas. The recent wildfires across a broad landscape on the district have altered habitats and populations adding to the potential cumulative effects of current proposed projects within these areas. The anticipated cumulative effect on each species varies relative to each species’ tolerance to disturbance.

Several projects on the district in the foreseeable future overlap in space and time with the proposed action and would have cumulative effects on botanical species and their habitat. The projects include post-fire reforestation, imminent danger tree felling along road 4220, BAER work, post-fire recreational site and trail repair, danger tree and hazard tree felling along recreation access roads, road maintenance and repair, aquatic restoration projects, powerline maintenance including access roads, and timber sales including those on neighboring BLM lands.

Ground-disturbing action that occurs within the same area and timeframe of this project that disrupts the soil organic layer, including decaying logs, would affect sensitive and other rare botanical species or suitable habitat and would result in cumulative effects.

Timber sales and other projects that include activities like tree felling, and earth disturbing equipment operations that would directly negatively affect the species, resulting in potential loss of individuals but not viability of the species. Beneficial cumulative impacts from post-fire reforestation would support an expedited habitat environment for some species. Closing and decommissioning roads would provide a deflector protection buffer limiting future disturbance opportunities. Other projects considered in the cumulative effects analysis include botanical PDC to protect and avoid sensitive plants. Therefore, the resultant cumulative effect to sensitive and survey and manage plants is neutral.

3.10.4 Forest Plan Consistency

The project is found to be consistent with botanical resource standards and guidelines because PDC are included that require monitoring, avoidance, protection, or would minimize disturbance to habitat and known sites for Regional Forester’s Sensitive Species as well as Survey and Manage species within the AOC. After determining the

scale, scope, and intensity of the proposed action against the existing condition, habitat-disturbing activities are not likely to have a substantial adverse impact on the species' habitat, its life cycle, microclimate, or life support requirements. Therefore, survey and manage pre-disturbance surveys were not needed. In addition, the specialist report includes all the necessary components of a biological evaluation in compliance with the Forest Plan.

Further, the planning area includes one Wild and Scenic River with botanical outstandingly remarkable values (ORV); Segment 1³⁹ of the Collawash River. This segment was impacted by the Lionshead and Bull Complex fires. The botanical ORV is for cold water corydalis and the Collawash River has habitat for this species. Danger tree falling would occur within the outer fringes of this WSR corridor along portions of NFS road 6370220, and within the corridor along the 6380, 6380120, and 6380130. This ORV would be maintained (not impacted) by the proposed action because PDC have been developed that restrict activities within riparian areas. Additionally, actions are not proposed within the bed and banks of the rivers. This biological evaluation does not supersede or provide any new evidence that may counter information about invasive plants in the CRMP. The effects determination reflects analysis bounded by the proposed action and the geographical extent of documented invasive plants.

3.11 Invasive Species

3.11.1 Existing Condition

The extent of damage to botanical resources as a result of the fires has not been determined at this time. In the summer of 2021, field surveys occurred within Riverside and Lionshead fires focused on invasive plants. Annual weedy species adapted to disturbance were in abundance along road margins while the interior of the forest had sparse ground coverage. Certain populations that persisted for many years were not observed while other populations remained intact. In addition to the surveys, a small fraction of the area was treated with herbicides approved by the Forest.

Botanical surveys were conducted within and around portions of the AOC in recent years, which revealed scattered populations of invasive species Table 40. Many road systems have been controlled yearly following Record of Decision for Site Specific Invasive Plant Treatments for Mt. Hood National Forest and Columbia River Gorge National Scenic Area (2008). Prior to the wildfires of 2020 and 2021, the west side of the Forest had a diverse composition of invasive plants across many disturbed sites along roadways, administrative facilities, recreation sites, and trails. Control efforts have been largely focused on high priority species and targeted populations that had a manageable size. The species list in Table 40 represents a fraction of observed populations that may potentially still be present after the burn. Most of the listed invasive plants have a tolerance to fire to some degree. The survivorship of any particular population could be influenced by several factors such as intact root systems, fire severity and intensity, pre-disturbance conditions, and distribution of nearby infestations unaffected by the fire.

³⁹ Segment 1 is described in the 2022 Comprehensive River Management Plan as the headwaters of the East Fork Collawash River to Buckeye Creek.

Table 40. Non-native invasive plants within the AOC.

Scientific Name	Common Name	Oregon Noxious Weed Designation	Infested Acres
<i>Brachypodium sylvaticum</i>	false-brome	B	2
<i>Centaurea diffusa</i>	diffuse knapweed	B	4
<i>Centaurea x moncktonii</i> (<i>Centaurea x gerstlaueri</i>)	meadow knapweed	B	<1
<i>Centaurea montana</i>	perennial cornflower	NA	<1
<i>Centaurea stoebe</i>	spotted knapweed	B, T	5
<i>Centaurea stoebe</i> ssp. <i>micranthos</i>	spotted knapweed	B, T	2
<i>Cirsium arvense</i>	Canada thistle	B	9
<i>Cirsium vulgare</i>	bull thistle	B	5
<i>Cytisus scoparius</i>	Scotch broom	B	423
<i>Daucus carota</i>	Queen Anne's lace	NA	<1
<i>Geranium lucidum</i>	shining geranium	B	18
<i>Geranium robertianum</i>	Robert geranium	B	87
<i>Hedera helix</i>	English ivy	B	2
<i>Hieracium lachenalii</i>	common hawkweed	NA	12
<i>Hieracium pilosella</i>	mouse-ear hawkweed	A, T	Trace
<i>Hieracium sabaudum</i>	New England hawkweed	NA	25
<i>Hypericum perforatum</i>	common St. Johnswort	B	91
<i>Ilex aquifolium</i>	English holly	NA	<1
<i>Impatiens capensis</i>	spotted jewelweed	NA	<1
<i>Lathyrus latifolius</i>	perennial pea	B	<1
<i>Phalaris arundinacea</i>	reed canarygrass	B, T	35
<i>Polygonum x bohemicum</i> (<i>Fallopia x bohemica</i>)	Bohemian knotweed	B	<1
<i>Polygonum cuspidatum</i> (<i>Fallopia japonica</i>)	Japanese knotweed	B	<1
<i>Polygonum</i> sp.	knotweed		<1
<i>Potentilla recta</i>	sulphur cinquefoil	B	<1
<i>Robinia pseudoacacia</i>	black locust	NA	Trace
<i>Rubus armeniacus</i>	Himalayan (Armenian) blackberry	B	8
<i>Rubus laciniatus</i>	cutleaf blackberry	NA	4
<i>Senecio jacobaea</i>	stinking willie (tansy ragwort)	B, T	2
<i>Sorbus aucuparia</i>	European mountain ash	NA	4

Scientific Name	Common Name	Oregon Noxious Weed Designation	Infested Acres
<i>Tanacetum vulgare</i>	common tansy	NA	<1

3.11.2 Effects Summary

The non-native invasive plant and risk analysis for this project showed a medium level of risk of spreading the following high priority species. These species occur along roadsides and trails within the proposed project area.

1. false-brome (*Brachypodium sylvaticum*),
2. knapweeds (*Centaurea* spp.),
3. invasive thistles (*Cirsium* spp.),
4. Scotch broom (*Cytisus scoparius*),
5. invasive geraniums (*Geranium* spp.),
6. invasive hawkweeds (*Hieracium* spp.),
7. reed canarygrass (*Phalaris arundinacea*),
8. invasive knotweeds (*Polygonum* spp.), and
9. invasive blackberries (*Rubus* spp.).

The effects from implementing the proposed action would disturb invasive plants growing within the AOC with potential to spread seed into new areas. The disturbed ground could provide growing opportunities for more invasive plants, degrading habitat negatively affecting native plants, wildlife, pollinators, and recreational values. Projects planned for implementation in the near future could have negative cumulative effects to the introduction and spread of invasive plants in the long term. However, effects are not substantial because the risk of spread would be minimized by implementing the project design criteria.

3.11.3 Direct, Indirect, Cumulative Effects

3.11.3.1 Direct and Indirect

Direct effects would occur as a result of moving vegetation directly across or driving atop non-native invasive plants resulting in disturbance to the plant's root system and stems. Indirect effects would occur as a result of disrupting the soil organic layer (i.e., yarding, landing operations, piling and managing slash), exposing mineral soil which would create places for invasive plants to develop. Other indirect effects would result from recreationists serving as vectors for seed dispersal once areas reopen. Direct and indirect effects would be minimized by the application PDC that were developed specifically to address risks associated with the introduction and spread of these species.

3.11.3.2 Cumulative

Post-fire reforestation, ongoing timber sales, and ongoing recreation site and partner danger tree removal and restoration are considered in the cumulative effects analysis. Early detection and rapid response of invasive plants within each fire perimeter would have beneficial effects. Population of non-native invasive plants within the planning area would be held in check by the use of herbicide, which would lower the risk of spreading to new areas overtime. However, if treatments are ineffective or new populations occur in the foreseeable future from multiple projects overlapping in space and time, then there could be a change in the plant community structure along roads.

3.11.4 Forest Plan Consistency

PDC would be employed during implementation to avoid high risk invasive plant populations, clean heavy equipment, and use weed-free or native plant materials for maintenance and restoration. Therefore, the proposed action is consistent with the 2005 Pacific Northwest Region Record of Decision (ROD) for Preventing and Managing Invasive Plants and the 2008 Final Environmental Impact Statement (FEIS) for Site-Specific Invasive Plant Treatments for Mt. Hood National Forest and Columbia River Gorge National Scenic Area in Oregon, including Forest Plan Amendment #16.

PDC would also prevent the introduction and spread of invasive plants into Wild and Scenic River corridors, protecting Wild and Scenic River values. Routine monitoring and control efforts along transmission pathways like roads and trails would reduce the risk of spread and negatively affect the quality of the Wild and Scenic Rivers.

3.12 Fuels and Air Quality

3.12.1 Existing Condition

The AOC is a mix of burned standing snags, wind throw, some previously felled danger trees⁴⁰, and slash along NFS roads. In areas of previously felled danger trees there is an estimated range of 50-100 tons-per-acre of slash on the ground which includes small branches that retained some needles, or where needles have dropped to the ground, creating a new fuel bed, correlated to fuel model Timber Litter 7 (TL 7). The primary carrier of fire in TL 7 is a heavy load of conifer litter and larger diameter downed logs. Where danger trees have not been cut, needle cast and sparse new growth of grass and shrubs is present at an estimated 12-30 tons-per-acre of fuel loading, correlated to fuel model TL 1. The primary carrier of fire in TL 1 is a low load of compact conifer litter at light to moderate loads.

Over time with no action, existing condition would persist. A buildup of fuels (i.e. fallen trees) along the road system would result in increased risk associated with future fire behavior and increase risks for firefighters due to the prolonged exposure to working under hazard trees, lack of reliable access and egress along fire affected NFS roads (including roads around Timber Lake Job Corps and Ripplebrook). Burned trees that would fall could still contribute to fuel loading and fire behavior when they mixed with new growth. Within three years, the accumulation of naturally falling trees combined with successional growth would create a deep fire-receptive fuel bed. Fuel loading and depth would continue to increase. Similar conditions were observed after the 36 Pit Fire from 2014 in this same area. These conditions increase the fire's resistance to control by suppression personnel due to high fuel loading leading to extreme flame lengths and rates of fire spread.

A long-term continuation of the existing condition would result changes to the fire behavior fuel models throughout the AOC. While fuel models loading would be accurate, fire behavior may be overestimated until vegetation presence accumulates within the next 5 to 10 years. In addition, this would be counterproductive to the Mt.

⁴⁰ Some roadside danger trees were felled during active fire suppression operations and under 36CFR220.6(b) for Burned Area Emergency Response (BAER) work.

Hood Strategic Fuel Treatment Placement Plan which provides a framework for fuels and fire hazard management.

A functioning and accessible road system provides a foundation for strategic and environmentally low-impact initial and extended attack fire suppression. In the absence of cutting (or planning to cut) danger trees, many roads within the AOC would remain closed (naturally from fallen trees or lack of road maintenance). During active suppression containment lines would be created with heavy equipment or a fall back to the next closest open road systems to be used.

Taking no action would have an impact on the reliable access to Remote Area Weather Station (RAWS) and radio repeater towers that are used by county emergency management and law enforcement among others. There is no cell phone coverage in many locations throughout planning area and the District, therefore radio communication is the primary method. Fire Management uses the RAWS data to develop indices for fire danger and staffing. Without reliable access, RAWS and communication infrastructure maintenance could be compromised.

3.12.2 Effects Summary

The proposed action would have direct beneficial effects to firefighting strategy and increase the likelihood for direct attack opportunities. While smoke would be emitted as a result of pile burning for some slash disposal, the effects would be greatly minimized through the application of Smoke Management BMPs, PDC, and State of Oregon standards. Negative indirect effects to fuels resources could be realized if piles of slash and chips are left for too long without proper disposal. Overall, effects to fuels resources are minimal and beneficial. As a result, cumulative effects are minimal.

3.12.3 Direct, Indirect, Cumulative Effects

3.12.3.1 Direct and Indirect

The proposed action would create some fuel breaks along roads resulting in strategic opportunities for future firefighting efforts. The removal of danger trees and disposal of excess slash would reduce flame lengths and fire behavior within the AOC creating a lower risk to firefighters and higher likelihood for attaining future suppression objectives. The Mt. Hood Strategic Fuel Treatment Placement Plan would continue to be used and implemented and some created fuel breaks⁴¹ would increase public and firefighter safety, suppression effectiveness, and decrease management costs.

Potential Operational Delineations (POD) would be improved as a result of the proposed action. A POD is a framework for cross boundary, collaborative, and integrative fire planning that can support place-based implementation of the National Cohesive Wildland Fire Management Strategy. PODs allow for continuous development of new, risk informed approaches to address emerging wildland fire management challenges. POD boundaries are defined by potential control features that can be leveraged for fire containment. The proposed action and POD boundaries have many overlapping areas that could provide benefits to wildland fire managers. PODs were used during the Lionshead, Riverside, and Bull Complex Fires to identify critical roads that would serve

⁴¹ Fuel breaks are not silviculturally prescribed, nor are they part of the purpose and need. However, in some areas, the cutting and removal of danger trees and slash could result in some de facto fuel breaks.

as containment lines. POD boundaries would be improved as a result of the proposed action for strategic roads adjacent to the Bull Complex (see Table 10 for a list of roads).

Managing slash within the AOC through pile burning would follow State of Oregon standards and agency Best Smoke Management tactics. Smoke management standards, BMPs, and PDC would be followed, resulting in minimal smoke impacts locally to the project area, and would not have an impact on air quality. Pile burning would take an estimated 2-3 years to complete as implementation along roads is completed. Indirectly, the unburned piles could pose a fire hazard until they are treated.

Chipping, masticating, and scattering generated slash can change the arrangement of the slash on the ground but would not change the tons per acre volume estimates. It can be difficult to estimate amounts due to species, composition, and method. The slash would be managed the following ways:

If chipped material is not hauled away or spread in a reasonable timeframe, piles of chips left throughout the project area could negatively indirectly effect fuels management due to the time it takes for the chip piles to breakdown. The flammability of the piles is normally very low due to the high compaction, but during above average drying conditions these piles could be ignited by human activity, or fire could spread into these piles.

3.12.3.2 Cumulative

The cumulative shift in fire behavior model within the area of concern as a cumulative outcome of the proposed action and other post-fire restoration projects would not result in a large enough scale shift to impact fire behavior models across the landscape. The untreated areas will continue to have trees that will eventually fall and contribute to an increased fuel bed that will lead to increase fire behavior and increase the resistance to control by suppression efforts. Operationally, and within the AOC, the proposed action does have the impact to change the fuel models along the road systems that would benefit fire resources.

Over time, Cumulative results from the proposed action would directly aid in fire resource access and opportunities for containment lines using the Strategic Fuels Plan and the PODs planning efforts. A decreased response time for fire resources, would allow for greater opportunity to keep fires to a smaller footprint, resulting in less smoke impact to surrounding communities.

3.12.4 Forest Plan Consistency

Through the application of PDC the project is consistent with Forest Plan Air Quality goals and burning-related standards and guidelines. The proposed action does not include broadcast landscape area burning, only pile burning, for which a burn plan would be created.

3.13 Economic Analysis

3.13.1 Effects Summary

A qualitative analysis shows this project would come at a cost to the Government but would still provide jobs and wood products for the local economy. As the proposed action is implemented, access to areas of the District would be restored. Benefits would primarily impact the community of Estacada and surrounding municipalities. Increasing

opportunities to visit and recreate on the District would support recreation community and supporting business economic interests.

3.13.2 Direct, Indirect, Cumulative Effects

While economic considerations were made during project development, it was not a primary driver to project design, as the purpose and need pertains to danger tree mitigation and not timber production or economic recovery. Cutting danger trees as described in section 2.0 Project Development and Description would generate a large volume of wood. Some cut trees would be left on site for the benefit of post-fire recovery and attainment of resource objectives. Other cut trees could be removed and stored on forest to be utilized in future restoration activities. Cut danger trees that are in excess to these needs would be sold or disposed of as wood products such as (but not limited to) firewood, biomass chips, and saw logs.

It is estimated that 15 to 25 percent of the road miles proposed for danger tree abatement contains material of merchantable size to send to local sawmills. This estimate declines as time goes on. Due to wood deterioration post fire, it is estimated that virtually all material less than 20-inches in diameter would have little to no sawtimber value. Merchantability for large diameter (20-inches and greater) Douglas-fir and true firs is expected to be at most, half of what would be available as a green tree.

The costs related with the danger tree cutting and associated road work (implementing closures and decommissioning roads) would far exceed the recoverable value of merchantable timber in most cases. In areas where it is appropriate, the Forest Service intends to remove merchantable material where it is practicable to help offset the cost of the danger tree abatement work along NFS Roads. Realizing a negative cost-benefit ratio, the majority of danger tree cutting would be accomplished through service contracts or partnerships at a cost to the government.

3.13.3 Forest Plan Consistency

The proposed action is consistent with Forest Plan management goals and standards and guidelines relative to economic values. Regardless of implementation mechanism (such as but not limited to timber sale contracts, service contracts, or agreements) operations associated with the proposed action would provide for jobs associated with logging and sawmill operations. Timber management objectives in the Forest Plan are associated primarily with regulated timber harvest and timber productivity. This qualitative analysis satisfies FW-266 which requires economic analysis to determine appropriate funding. This project is not a traditional vegetation management project, as the purpose and need are driven by minimizing risk to travelers and ensuring access and egress on NFS roads. As opportunities for sale contracts are available those portions of the project would be carefully developed in an economically viable way.

Additionally, the proposed action includes the closing and decommissioning of roads to meet both travel management objectives and operational efficiency (see section 2.2.1.3 Operational Efficiency) consistent with FW-432. While some portions of the AOC overlap C1-Timber Emphasis management areas, decisions to cut trees that are within striking distance of the road would be based upon whether or not they meet danger tree and/or mortality criteria, therefore C1-021 is not applicable to this project.

3.14 Climate Change

3.14.1 Existing Condition

Climate change is affecting national forests and is expected to intensify in the future. For the Forest, climate change projections suggest that temperature would increase from 2.6 degrees Celsius to 6.0 degrees Celsius over the 21st century (Climate Change Vulnerability and Adaptation in the Columbia River Gorge, Mount Hood National Forest, and Willamette National Forest in press ((CCVA), pg. 30). Precipitation patterns are also expected to change, but the direction and magnitude of precipitation changes are more uncertain (CCVA, pg. 30). The planning area spans across multiple sub watersheds and vegetation types. Projections from the CCVA indicate the planning area is exposed to several climate change vulnerabilities. Information from the CCVA informed the analysis of the proposed action as it relates to climate impacts.

Key vulnerabilities to climate change within the planning area include hydrologic and water resources, fish and aquatic ecosystems, and recreation. Other vulnerabilities within the planning area include vegetation and disturbance, wildlife and wildlife habitat, and ecosystem services.

3.14.2 Effects Summary

In summary, this proposed action would affect a relatively small amount of land and carbon on the Forest. In the near term the proposed action may contribute an extremely small quantity of greenhouse gas (GHG) emissions relative to national and global emissions for a brief period of time. Carbon would be removed from the atmosphere over time as the forest regrows and recovers from the wildfires.

3.14.3 Direct, Indirect, Cumulative Effects

This proposed action would affect 7,600 non-contiguous acres of forest along fire-affected roads. This scope and degree of change to the Forest would be minor, affecting roughly 1.8 percent of the acres that make up the District (413,700 acres), and an even smaller percentage when compared to the roughly 1.1-million-acre Forest. In addition, the effect of the proposed action focuses on aboveground carbon stocks, which typically comprise a fraction of the total ecosystem carbon stocks in the proposed managed area. Cutting dead and dying trees that are within striking distance along roads as well as the travel management actions to close and decommission roads are not considered major sources of GHG emissions. Forested land will not be converted into a developed or agricultural condition or otherwise result in the loss of forested area. In areas along roads where forested stands of live and healthy trees that do not pose a threat to the fire-affected roads would be retained and would maintain a vigorous condition that supports post-fire restoration and tree growth and productivity, thus contributing to long-term carbon uptake and storage.

Any initial carbon emissions from the proposed action would be balanced and possibly eliminated as the stand recovers and regenerates. In other words, carbon emissions during the implementation of the proposed project would have only a momentary influence on atmospheric carbon concentrations, because carbon would be removed from the atmosphere with time as the forest regrows, further minimizing or mitigating any potential cumulative effects. Through the implementation of the proposed action land managers and partner organizations could have an assurance of access and egress along fire-affected roads and would be more likely to engage in post-fire reforestation and restoration activities over time across a larger land base.

3.14.4 Forest Plan Consistency

The Forest Plan does not address management actions or strategies related to climate change. While the purpose and need of the project is not related to climate change adaptation, elements of the proposed action are in alignment with the adaptation strategies and tactics identified in the CCVA.

PDC are included as part of the proposed action. Some PDC could be considered adaptation actions; however, they were not developed for the sake of adapting the project to meet needs related to climate change. Rather, they were developed with the aim to minimize the project's effects on the respective resource.

- Hydrology and water resources; adaptation: the project's proposed action includes measures towards right-sizing the existing transportation system through closing and decommissioning unneeded, poor functioning road systems. Road closure and decommissioning actions would include storm proofing (i.e., pulling culverts, rehabilitation, hydrologic stabilization) these roads systems.
- Fish and aquatic ecosystems; adaptation: the proposed action includes PDC that could help to restore to some degree, fire-affected streams and riparian areas that exist within the dead or dying tree striking distance of a road. Trees would be felled and left within riparian areas, and tree felling PDC have been created specific to the area along NFS Road 5400000 where activities would parallel Fish Creek. PDC have also been developed to mitigate the spread and/or introduction of invasive weeds during operations.
- Recreation; adaptation: minimize risk from dead and dying trees along travel corridors. The proposed action includes closure and decommissioning of roads where danger trees would not be treated (except as necessary to implement the closure or decommissioning).
- Wildlife and wildlife habitat; adaptation: habitat connectivity considerations have been made in the wildlife analysis to minimize impacts to wildlife. Considerations include an analysis of the project's impacts to post-fire foraging areas and development of PDC for the Northern Spotted Owl.
- Vegetation and disturbance; adaptation for western hemlock forests: This project does not propose vegetation management or restoration actions. Other projects have been analyzed and signed or are in the planning phase that would address vegetation-related adaptation actions, such as post-fire reforestation.
- Ecosystem services; adaptation: In addition to the aforementioned adaptations, PDC are included in the proposed action to protect or not further degrade scenic values within the burned fire landscape. Opportunities for enhancing carbon sequestration could be improved through reforestation and other post-fire restoration projects when risks associated with traveling on forest roads are minimized.

4.0 Other Required Disclosures

4.1 Consumers, Civil Rights, Minority Groups, Women, and Environmental Justice

Executive Order 12898 directs agencies to identify and address disproportionately high and adverse human health or environmental effects of projects on certain populations. This includes Asian Americans, African Americans, Hispanics, American Indians, low- income populations, and subsistence uses. The Civil Rights Act of 1964 prohibits discrimination in program delivery and employment. There are communities with minorities and low-income populations that may

be affected by the project. The town of Estacada (the nearest such community) is 10 miles away. Even farther away, but potentially affected are the American Indian communities of Warm Springs and Grande Ronde. There are no known areas of religious significance in the proposed action areas. There are no known special places for minority or low-income communities in the proposed action areas. Individuals may work, recreate, gather forest products, or have other interests in the planning area, which is currently under closure by forest order as a result of the fires. By virtual of implementing the proposed action that would result in minimize risk to travelers and restoring access throughout the District, neither the impacts nor benefits of this project would fall disproportionately on minorities or low-income populations.

No disproportionate impacts to consumers, civil rights, minority groups, and women are expected from this project. Cutting danger trees, managing slash, and other road-related work would be implemented by contracts with private and other businesses or organizations. Contracting for the project's activities would use approved management direction to protect the rights of these companies or organizations. No adverse civil rights impacts were identified. There would be no meaningful or measurable direct, indirect, or cumulative effects to environmental justice or civil rights.

4.2 Wild and Scenic Rivers

The Riverside, Lionshead, and Bull Complex fires burned within portions of the Clackamas River, Roaring River, South Fork Clackamas River, Collawash River, and Fish Creek Wild and Scenic River corridors. Each of these rivers have a Comprehensive River Management Plan (CRMP) that guide management actions within their river corridors. The Clackamas River is also a State Scenic Waterway. A summary of the designation of each river within the planning area is provided in Table 41. PDC have been developed as part of the proposed action to ensure values associated with the rivers would not further degrade as a result of the removal of danger trees or implementation of travel management actions. The proposed action does not include any activity within the bed or banks of Wild and Scenic Rivers. PDC (B1.i) has been included, requiring a Section 7 review prior to the felling of any danger tree into a Wild and Scenic River. In addition, that same PDC has requirements for danger tree cutting that would minimize impacts to water quality. This PDC may result in some operational inefficiencies in the long-term but is a necessary trade-off to ensure the protection of Wild and Scenic River values.

Table 41. Outstandingly remarkable values wild and scenic rivers within the planning area.

River	Description	Outstandingly Remarkable Values	Classification
Clackamas	Big Spring to North Fork Reservoir	Botany/Ecology, Fish, Wildlife, Recreation, Cultural Resources	Scenic and Recreational
Roaring	Headwaters to river mile 0.2.	Water Quality, Botany, Fisheries, Wildlife Habitat, Recreation, Scenic Resources	Wild ⁴²
Collawash	Segment 1: Headwaters to Buckeye Creek.	Recreation, Geology, Fisheries, and Botany	Scenic
Collawash	Segment 2: Buckeye Creek to its confluence with the Clackamas River.	Geology and Fisheries	Recreational
Fish Creek	Headwaters to its confluence with the Clackamas River.	Fisheries	Recreational

⁴² A short section of Roaring River crosses Highway 224 near the mouth. It overlaps the Clackamas River corridor and has a recreational designation.

River	Description	Outstandingly Remarkable Values	Classification
South Fork Clackamas	Confluence of main stem with the East Fork of the South Fork Clackamas to confluence with the Clackamas River.	Scenery, Historic	Wild

The proposed action is consistent with the Clackamas River and Nine Rivers comprehensive river management plans' guidance in that that the cutting and removal of trees may occur if the action is designed to protect or enhance river values and ensure visitor safety (A1-CLA-29, and B.8.a respectively). This project's purpose and need are related to visitor safety and the proposed action includes PDC that are developed so that river values would be protected.

The CRMP for the South Fork Clackamas River, Fish Creek, and Collawash, were completed in January 2022. This river management plan amended the Forest Plan to modify plan components including B1 and A1 management areas and B1-076, which is specific to Fifteenmile Creek; not associated with this project. Appendix C of the 2022 Comprehensive River Management Plan lists the management direction that amended the Forest Plan relative to these rivers.

The Collawash River, and Fish Creek are managed using the B1 land use allocation for their designated scenic and recreational segments. The South Fork Clackamas River is managed using the A1 land use allocation for their designated Wild segments.

The goal of B1 designated lands is to protect and enhance the resource values for which a river was designated. The goals for Wild, Scenic, and Recreational River segments are described in the Forest Plan on page Four-208, and are summarized here:

- Wild: Perpetuate a primitive recreation experience and protect the river corridor to maintain an essentially unmodified environment.
- Scenic: Maintain or enhance quality scenery and protect the essentially undeveloped character of the shoreline.
- Recreational: Provide opportunities for recreation activities and maintain visual quality of the river corridors.

Forest Plan B1 management area direction for Scenic and Recreational rivers indicates that fire damaged trees can be removed (B1-047). Project design criteria are included in the proposed action that would protect riverbanks, consistent with the standard and guideline. The 2022 CRMP allows for tree cutting and removal in response to fire, natural catastrophe, or disasters and for the purpose of ensuring public safety (CRMP B.8.a). In addition, CRMP management direction for scenic and recreational segments states that timber salvage activities to harvest fire damaged trees for the protection of river values or visitors shall be permitted while protecting riverbanks (B.8.d).

Table 42. Miles of road by mortality percentage (from fire burn intensity) within each river corridor designation.

Basal Area Mortality (%)	0%	1-10%	11-25%	26-50%	51-75%	76-90%	91-100%
Clackamas River - Recreational	1.5	0.3	0.6	1.8	3.9	0.7	0.1
Clackamas - Recreational (HWY 224)	0.2	0.1	0.5	2.5	6.4	3.2	1.1

Basal Area Mortality (%)	0%	1-10%	11-25%	26-50%	51-75%	76-90%	91-100%
Clackamas - Scenic	2.0	0.3	0.6	1.5	1.0	0.5	0.4
Clackamas - Scenic (HWY 224)	0.3	0.1	0.2	0.5	1.0	0.7	0.2
South Fork Clackamas - Wild	0	0	0	0.1	0.3	0	0
Fish Creek - Recreational	0	0	0	0.3	1.2	0.2	0.2
Collawash - Recreational	0	0	0	0	0	0	0
Collawash - Scenic	1.0	0	0.1	0.2	0.1	0	0

There are 12 miles of AOC that overlap with WSR corridors within the planning area. As a result of the fires, the existing condition is not in alignment with the desired future WSR conditions for scenery expressed by the direction in the Forest Plan. A more in-depth discussion and effects analysis related to scenic values associated with these rivers is included in section 3.4 Visuals. While the proposed action would not result in enhancements to river values, the proposed action has been designed such that it would protect, and not further degrade WSR outstandingly remarkable values.

4.3 National Forest Management Act of 1976

See Table 5 in Section 2.3 Management Direction for a list of all Forest Plan management areas that overlap the AOC.

Further, statements of Forest Plan consistency are provided in each resource section within 3.0 Environmental Consequences, and within section 2.0 Project Development and Description.

While the mechanism to achieve purpose and need of the project varies, the proposed action is not in conflict with the Forest Plan as amended, nor the National Forest Management Act because the proposed action would result in restoring access and minimizing risk to employees and partners who would continue to manage areas within the forest for timber and vegetation objectives.

4.4 Inventoried Roadless Areas, Unroaded, Wilderness, and Potential Wilderness Areas –

There are no inventoried roadless areas that would be impacted by the proposed action. Danger tree removal, and travel management actions are not proposed within an inventoried roadless area. There are no unroaded areas that would be impacted by the proposed action.

The Omnibus Public Land Management Act of 2009 designated the Roaring River Potential Wilderness area. Road decommissioning is proposed within the potential wilderness in effort to move the area towards meeting the characteristics and objectives of a wilderness area. Potential wilderness is to be managed in accordance with Section 4 of the Wilderness Act (16 U.S.C. 1133) which prohibits permanent roads and use of motorized equipment except as necessary to meet the minimum requirements of the administration of the area (Omnibus Public Land Management Act of 2009, Wilderness Act of 1962). The following roads are closely enough associated with the planning area; therefore they were included in this project:

- A portion of NFS Road 4635000 is proposed for decommissioning starting just past the junction with NFS Road 4635140 to the end; 5 miles, and

- the entirety of NFS Roads 4635150 (0.5 miles), 4635152 (0.3 miles), 4635157 (2 miles), 4635160 (0.4 miles), and 4635170 (0.1 miles).

Decommissioning these roads removes the ability to access the lands by motorized vehicle. In the future, additional analysis would be needed to determine whether or not the conditions of the area are compatible with the Wilderness Act, thereby changing the management area from C1-Timber Emphasis to A2-Wilderness.

Wilderness areas with provisional boundaries are adjacent to 15 miles of NFS roads where danger tree cutting is proposed (Table 43). The provisional boundaries mapped under the Omnibus Public Land Management Act of 2009 did not account for existing road corridor maintenance needs. For post-fire response needs along NFS roads, a 300-foot maintenance corridor on either side of an NFS roads that bisects or parallels provisional and unsurveyed wilderness boundaries is applied to this project. The proposed action does not include the cutting and removal of danger trees from within wilderness areas.

Table 43. Miles of AOC associated with provisional wilderness boundaries.

Fire Area	Wilderness within the planning area and boundary status	Miles of AOC
Riverside	Clackamas - Provisional	9
Riverside	Roaring River - Provisional	6
Lionshead	Mt. Jefferson Wilderness- Final	3
Bull Complex	Bull of the Woods - Provisional	<1

4.5 Prime Farmlands, Rangelands, and Forestlands

There are no prime farmlands, rangelands, or forestlands that would be impacted by the proposed action. Danger tree removal and travel management actions are not proposed within these areas.

4.6 Potential or Unusual Expenditures of Energy

There are no elements of the proposed action that would result in any unusual expenditure of energy.

4.7 Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that are forever lost and cannot be reversed. Irretrievable commitments of resources are considered those that are lost for a period of time and, in time, can be replaced. The use of rock for road surfacing is an irreversible resource commitment; however, rock quarries have sufficient capacity to provide for the long-term needs for road surfacing rock. There are no other elements of the proposed action that would result in permanent or temporary loss of resources or the permanent or temporary conversion in the of uses of NFS lands included in the planning area.

4.8 Conflicts with Plans, Policies, or Other Jurisdictions

At the implementation phase, the Forest would work with the Bureau of Land Management to ensure fire affected NFS roads systems that navigate between NFS lands and BLM lands would be managed such that they would meet the purpose and need of this project. The proposed action would not be in conflict with plans or policies of other jurisdictions including Tribes.

5.0 Consultation and Coordination

Individuals, Federal, State, and Local Agencies

Notification of the scoping period for the project was provided through the GovDelivery subscription system and was sent to 970 recipients. For the scoping period, unique and individual letters were sent to Tribes. The Forest historically consults with the Confederated Tribes of Warm Springs Reservation of Oregon and the Confederated Tribes of Grand Ronde for project proposals in this area. The Forest Service collaborated with the Tribes and the Oregon State Historic Preservation Office (SHPO) to develop a programmatic agreement regarding the process for compliance with Section 106 of the National Historic Preservation Act for undertakings related to the 2020 Wildfires (Riverside and Lionshead). The need to address danger trees within the areas affected by recent wildfires was a frequent topic of discussion between Mt Hood and Tribal specialists. Coordination occurred March through June of 2021. Other coordination discussions with Tribal partners related to hazard trees within the burn areas occurred in October and November 2021, and February 2022. A description of this proposed action accompanied by a formal consultation letter was provided to the Tribes in January. No comments or concerns were raised. Additional information regarding the public involvement process is provided in section 2.5 Public Involvement.

Fish: The proposed action has been developed to be consistent with RAMBO (for danger tree falling within riparian reserves along roads) and ARBO II (for culvert work and road decommissioning) therefore, no additional consultation is required.

Wildlife: As a result of the 2021 Clackamas Fires Danger Tree Abatement Decision Memo, an initial variance request for additional “Habitat Removed Spotted Owl Foraging” was submitted by the Forest to U.S. Fish and Wildlife Service (USFWS) in October 2021 and was approved. Due to the changes to the AOC including the addition of the Bull Complex fire for this environmental assessment, a second variance request is being prepared and will be submitted to USFWS. The variance requests would allow for treatment within portions of PFF habitat. Within the AOC, four percent of available PFF habitat (1,943 acres) would be affected out of all of the available PFF habitat within the rest of the planning area (47,677 acres).

Heritage: The proposed action has been developed to be consistent with the 2004 Programmatic Agreement and the 2020 Wildland Fires Programmatic Agreement. No additional consultation is required.