

River Values Report

For

Nine Wild and Scenic Rivers on Mt. Hood National Forest

Updated February 2021



South Fork Clackamas River Falls, along the South Fork Clackamas Wild and Scenic River Segment



Forest Service

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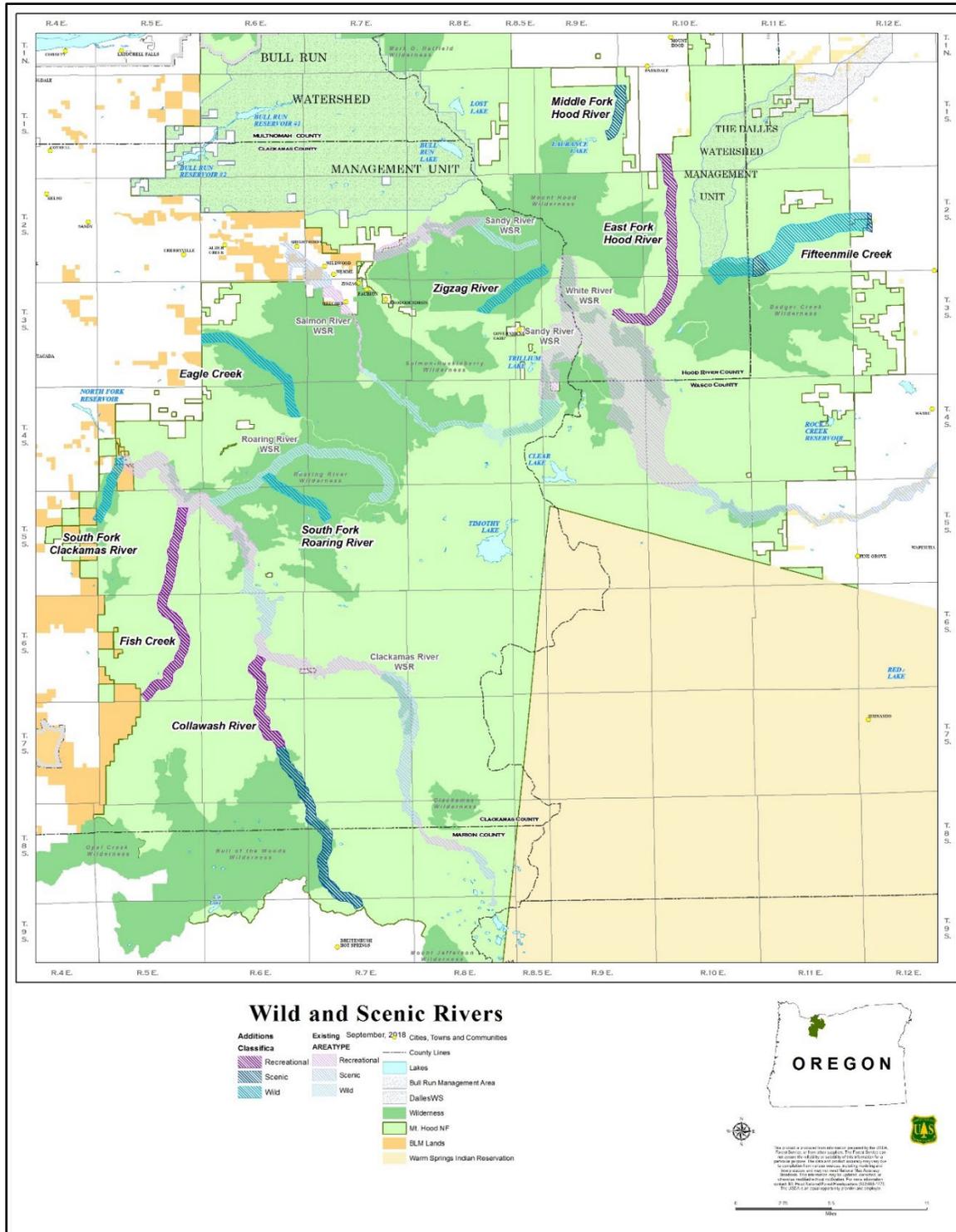
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Map 1. Wild and Scenic Rivers Designated on Mt. Hood National (additions designated in 2009)

Introduction

In 2009, nine rivers/streams on the Mt. Hood National Forest were designated as additions to the National Wild and Scenic Rivers System in the Omnibus Public Land Management Act (123 Stat. 991, P.L. 111-11). The Omnibus Act designated 81 miles of wild and scenic rivers across Mt. Hood National Forest (the forest) on the Barlow, Hood River, Clackamas, and Zigzag Ranger Districts. These designated rivers include the Collawash River, Eagle Creek, East Fork Hood River, Fifteenmile Creek, Fish Creek, Middle Fork Hood River, South Fork Clackamas River, South Fork Roaring River, and Zigzag River (see Map 1).

These designated segments were classified as wild, recreational and scenic by Congress in the Omnibus Act (see Table 1). As described in Section 2(b) of the Wild and Scenic Rivers Act (the Act), a wild, scenic or recreational river is defined as follows:

- **Wild River:** A river or segment of a river that is free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- **Scenic River:** A river or segment of a river that is free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- **Recreational River:** A river or segment of a river that is readily accessible by road or railroad, that may have some development along its shorelines, and that may have undergone some impoundment or diversion in the past.

This report describes the values for which each river was added to the National Wild and Scenic Rivers System, which include free flow, water quality and outstandingly remarkable values—collectively referred to as river values. This report will determine and document which scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values within each wild and scenic river segment meet the standard for outstandingly remarkable values. This report documents the evaluation of resource conditions and river values at the time that Congress designated these rivers as a wild and scenic river, and updates these conditions and values to present condition.

It is important to identify the outstandingly remarkable values because the Wild and Scenic Rivers Act requires the administering agency to “protect and enhance” the river’s free-flowing condition, water quality and its outstandingly remarkable values. Protecting and enhancing the free-flow condition, water quality, and outstandingly remarkable values become the basis for managing the wild and scenic river corridor. In addition, these river values will be the cornerstone of a Comprehensive River Management Plan, which will be completed over the next three to five years.

Wild and Scenic Rivers Act Requirements

Enacted in 1968, the Wild and Scenic Rivers Act (16 U.S.C. 1271-1278) preserves selected rivers and their immediate environments in free-flowing condition in order to protect them for the benefit and enjoyment of present and future generations. The Act requires river-administering agencies and other federal agencies to protect and enhance the values for which the river was designated. The following statutory provisions highlight this “protect and enhance” mandate:

Section 10(a): Each component of the national wild and scenic rivers system shall be administered in such manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of these values. In such administration primary emphasis shall be given to protecting its aesthetic, scenic, historic, archeologic, and scientific features. Management plans for any such component may establish varying degrees of intensity for its protection and development, based on the special attributes of the area.

Rivers designated by the Act possess outstandingly remarkable values that may include one or more of the following: “scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values” (Section 1(b)). In order to be assessed as outstandingly remarkable, a river-related value must be a unique, rare, or exemplary feature that is significant at a comparative regional or national scale. Dictionary definitions of the words “unique” and “rare” indicate that such a value would be one that is a conspicuous example from among a number of similar values that are themselves uncommon or extraordinary.

While the spectrum of resources and opportunities that may be considered is broad, all values should be directly river-related. That is, they should:

- Be located in the river or on its immediate shorelands (generally within a quarter mile on either side of the river);
- Contribute substantially to the functioning of the river ecosystem; and/or
- Owe their location or existence to the presence of the river.

This evaluation uses the criteria developed by the Interagency Wild and Scenic Rivers Coordinating Council and incorporated into agency policy (Forest Service Handbook 1909.12, Chapter 82.14) to evaluate river values and determine the outstandingly remarkable values associated with a designated river (Interagency Wild and Scenic Rivers Coordinating Council, 1999). The determination that a river area contains outstandingly remarkable values is a professional judgment on the part of an interdisciplinary team, based on objective, scientific analysis.

The Act also requires the administering agency to establish a detailed river corridor boundary of an average of not more than 320 acres per river mile, unless otherwise specified in the designating legislation (Section 3(b), Section 10(a)). Section 4(d) of the Act specifies that until boundaries are officially established for designated rivers, an interim boundary will be in effect, generally comprising “that area measured within one-quarter mile [or greater if identified in the authorizing legislation] from the ordinary high water mark on each side of the river” upon designation. A final detailed boundary will be developed during the planning process for developing the Comprehensive River Management Plan and integrated in the Mt. Hood Land and Resource Management Plan (USDA Forest Service, 1990). For this report, the interim boundaries are being used.

Wild and Scenic River Designations

The Omnibus Public Land Management Act of 2009 (the Omnibus Act) was passed by Congress on March 30, 2009. Congress passed the Omnibus Act “to designate certain land as components of the National Wilderness Preservation System, to authorize certain programs and activities in the Department of the Interior and the Department of Agriculture, and for other purposes” (Public Law 111-11). The Omnibus Act added over 124,000 acres of wilderness, designated nine wild and scenic river segments, designated the Mt. Hood National Recreation Area, and designated several special resource management areas on the forest. All nine of the wild and scenic river segments and the interim corridors are managed

as directed by the Wild and Scenic Rivers Act of 1968. These designated segments are displayed in Map 1 and summarized in Table 1.

Table 1. Description and Classification of Wild, Scenic, and Recreational River Segments Designated by the Omnibus Act of 2009

Designated Segment	Description	Miles	Classification
Collawash River	Segment 1: Headwaters of the East Fork Collawash River to Buckeye Creek	12.9	Scenic
Collawash River	Segment 2: Buckeye Creek to Clackamas River	6.9	Recreational
Eagle Creek	Headwaters to the Mount Hood National Forest boundary	8.4	Wild
East Fork Hood River	Oregon State Highway 35 to the Mount Hood National Forest boundary	14.1	Recreational
Fifteenmile Creek	Segment 1: Source at Senecal Spring to the Badger Creek Wilderness boundary	2.6	Wild
Fifteenmile Creek	Segment 2: Badger Creek Wilderness boundary to the point 0.4 miles downstream	0.8	Scenic
Fifteenmile Creek	Segment 3: Point 0.4 miles downstream of the wilderness boundary to the western edge of T2S, R12E, Sec. 20	7.4	Wild
Fifteenmile Creek	Segment 4: Western edge of T2S, R12E, Sec. 20 to the southern edge of the NW quarter of the NW quarter of T2S, R12E, Sec. 20	0.3	Scenic
Fish Creek	Headwaters to the confluence with the Clackamas River	13.6	Recreational
Middle Fork Hood River	Confluence of Clear and Coe Branches to the North section line of section 11, T1S, R9E, Sec. 11	3.7	Scenic
South Fork Clackamas River	Confluence with the East Fork of the South Fork Clackamas to its confluence with the Clackamas River	4.3	Wild
South Fork Roaring River	Headwaters to its confluence with Roaring River	4.7	Wild
Zigzag River	Headwaters to the Mount Hood Wilderness Boundary	4.7	Wild

Upon designation, the interim river corridor was defined as a quarter mile from the ordinary high water mark on both sides of the designated river segments, as required by the Act for all segments, except Fifteenmile Creek. The interim boundary for Fifteenmile Creek was designated as follows in Section 1203(a)(1)(176)(B) of the Omnibus Act: “the lateral boundaries of both the wild river area and the scenic river area along Fifteenmile Creek shall include an average of not more than 640 acres per mile measured from the ordinary high water mark on both sides of the river.” No other specific direction for these designated river segments are included in the Omnibus Act.

Previous Identification of Outstandingly Remarkable Values

As part of the planning process in 1990, the forest assessed all rivers that were included in the Nationwide Rivers Inventory for suitability for inclusion in the Wild and Scenic Rivers System. The planning process also addressed all rivers flowing wholly or partially on National Forest System lands, as directed by the Forest Service Handbook (FSH 1909.12, Chapter 8). As such, Appendix E of the Final Environmental Impact Statement for the Mt. Hood Land and Resource Management Plan (herein referred to as the Forest Plan) evaluated the eligibility of eight out of the nine river segments designated by the Omnibus Act (USDA Forest Service 1990a). Also, Appendix E includes some segments of the designated river segments that have not been designated by Congress, and it did not consider Fifteenmile Creek. The eligibility findings for the eight segments designated by the Omnibus Act are summarized in Table 2.

Table 2. Summary of Appendix E for Designated River Segments

River Segment	Description	Mileage	Outstandingly Remarkable Values	Classification Based on Development
Collawash River	Segment 1: Headwaters to Buckeye Creek	11.0	Fisheries	Scenic
Collawash River	Segment 2: Buckeye Creek to Clackamas River	6.8	Geology/hydrology and Fisheries	Recreational
Eagle Creek	Segment 1: Headwaters to W. Sec Line, Sec 20, T2S, R6E	7.2	Fisheries and Wildlife	Wild
Eagle Creek	Segment 2: W. Sec Line, Sec 20, T2S, R6E to forest Boundary	1.1	Fisheries	Recreational*
East Fork Hood River	Segment 3: Highway 35 immediately below Sahalie Falls to forest boundary	13.4	Combination of recreation, geologic/hydrologic, wildlife, ecological/ biological	Recreational
Fish Creek	Headwaters to its confluence with the Clackamas River	13.5	Fisheries	Recreational
Middle Fork Hood River	Confluence of Clear Branch and Coe Branch to forest boundary	4.7 [±]	Recreational, Geology/hydrology, and Ecological/biological	Scenic
South Fork Clackamas River	Segment 2: Confluence of main stem with the East Fork of the South Fork Clackamas to confluence of Clackamas	4.2	Fisheries	Scenic
South Fork Roaring River	Headwaters to the confluence of the Roaring River	4.6	Wildlife	Wild
Zigzag River	Segment 1: Headwaters to Mt. Hood Wilderness Boundary	2.9 ⁺	Ineligible ⁺⁺	None

* Changed to a wild river because it overlaps with designated wilderness; both were designated in the Omnibus Act.

± Last mile not designated in Omnibus Act.

+ Mileage differs in Omnibus Act.

++ Zigzag River was found ineligible to be designated as a wild and scenic river because no values were found to be outstandingly remarkable.

The outstandingly remarkable values identified in Appendix E were reviewed and validated or refined for three of the river segments (Collawash River, East Fork Hood River, and Middle Fork Hood River) between 2009 and 2013. In addition, outstandingly remarkable values were identified for Fifteenmile Creek in 2010. The outstandingly remarkable values for these river segments were reviewed or identified based on management actions occurring or proposed within the interim corridors. These evaluations followed the same process used during the eligibility study and served as the basis for the process outlined in this report. Appendix E of the Forest Plan and these outstandingly remarkable values reviews served as the basis for reviewing and then validating or updating the outstandingly remarkable values as discussed in the Evaluation Process and Criteria section of this report.

Evaluation Process and Criteria

The river values evaluation is important first step in the development of the comprehensive river management planning process. The evaluation must take into consideration all features, which are directly river-related, and helps provide a holistic approach to investigating the relationship of river features. There are three components to the river values evaluation process: 1) determine the region of comparison;

2) establish the evaluation criteria for each outstandingly remarkable value; and, 3) confirm or determine the outstandingly remarkable values for each segment. This report will discuss each of these components in the following sections.

The forest convened an interdisciplinary team in December 2017 to begin the river values evaluation process. Members of the team included specialists in the following areas: hydrology, geology, fisheries, recreation, wildlife, and archeology (see the Interdisciplinary Team Members section). A follow-up workshop was held in March 2018 to review potential botanical outstandingly remarkable values.

Region of Comparison

The region of comparison is the Middle Cascades, from Mt. Adams to Mt. Jefferson, including the mountain peaks. Because of the closeness of the Portland-Vancouver metropolitan area to the forest, users from this area to The Dalles are considered local users for this evaluation. Local users also include the local communities surrounding the forest, such as Sandy, Welches, Estacada, Government Camp, Hood River, and Dufur. Also, the Confederated Tribes of Grand Ronde and the Confederated Tribes of Warm Springs are considered important local users of the forest. Users coming from other locations in Oregon and southwestern Washington are considered regional users.

Outstandingly Remarkable Values

Recreation and Scenery Values

The nine rivers represent an amazing example of Cascade crest drainages, which highlight both west- and east-side ecosystems. The rivers tumble down from the upper slopes of Mt. Hood and associated mountains and ridgelines. On the western slopes of the Cascade crest, the rivers, such as South Fork Roaring River, are dense with vegetation and lushly forested. To the east, Fifteenmile Creek transitions from glacially influenced floodplains into high desert environments dominated by pine, juniper, and white oak. Combined, the west-east rivers provide a wide range of recreation and scenic opportunities representing an incredible vestige of wild and scenic America. Six of the nine wild and scenic rivers flow through designated wilderness areas. These overlapping designations highlight the remote, primitive, and undeveloped quality of these rivers to the greater landscape, despite their proximity to the urban Portland metropolitan area. Recreation opportunities are enhanced and in some cases depend upon the classic Pacific Northwest scenery these rivers provide.

Recreation within the wild and scenic river environment includes both traditional and new recreation uses. In some cases, wild and scenic rivers may not be the destination, but they provide a backdrop to the overall visitor experience. The local community includes many expert and professional adventure athletes. Because many of these rivers are remote and less well known than others in the region, they provide opportunities for challenge and self-reliance, supporting innovative and emerging recreation uses. In many cases, these activities are difficult to track and characterize. For instance, some users are now using paddle boards for whitewater descents. In the future, these innovations may lead to unforeseen activities within the wild and scenic river landscape.

Recreation Evaluation Criteria

Recreational opportunities are, or have the potential to be, popular enough to attract visitors from throughout or beyond the region of comparison and/or are unique or rare within the region. River-related opportunities include, but are not limited to, sightseeing, interpretation, wildlife observation (wildlife dependent on a riparian environment), camping (water source and scenery), photography, hiking, fishing, hunting (species that are riparian dependent), and boating. The river may provide settings for national or regional usage or competitive events. Specific evaluation criteria are as follows:

- Popular enough to attract local and regional use;
- Recreation opportunities are rare or unique within the region; and/or,
- The river provides usage for regional and national events (excluding those wild and scenic rivers within wilderness).

Scenery Evaluation Criteria

The landscape elements of landform, vegetation, water, color, and related factors result in notable or exemplary visual features and/or attractions (would be highly memorable). When analyzing scenic values, additional factors—such as seasonal variations in vegetation, scale of cultural modifications, and the length of time negative intrusions are viewed—may be considered. Scenery and visual attractions may be highly diverse over the majority of the river or river segment. Other scenic designations, such as state scenic byways or scenic waterways, may also be considered. Specific evaluation criteria are as follows:

- Highly memorable;
- Highly diverse and not common to other rivers within the area;
- Photographs are often included in publications; and/or,
- Human alterations are absent or contribute favorably to visual quality (e.g., bridges, historic structures).

Geology/Hydrology

The rivers lie within the western, high and eastern slopes of the Cascade Mountain Range, which are dominated by volcanic deposits arising from the subduction of the Pacific plate beneath the North American plate. As a result of mountain building and glaciation, geologic processes include pyroclastic flows, debris flows, and earthflows. Terrain is generally mountainous, steeply sloping and highly dissected, leading to moderate to high stream gradients. The regional climatic regime includes an effect, resulting in a high to low precipitation gradient from west to east. Hydrologic regimes include rain-dominated, transitional, and snow-dominated with flashy, base flow, and snowmelt flow regimes.

Evaluation Criteria

The river, or the area within the river corridor, contains one or more examples of a geology/hydrology feature, process or phenomenon that is unique or rare within the region of comparison. The feature(s) may be in an unusually active stage of development, represent a “textbook” example, and/or represent a unique or rare combination of geologic/hydrologic features (erosional, volcanic, glacial, channel morphology, flow regime, streambank or streambed erosion, and water-created features such as waterfalls, sinks, caverns, wetlands or springs).

Fisheries and Wildlife

Headwaters on the forest provide high quality habitat for many regionally and nationally significant fish and wildlife species. These native species are self-sustaining and the river courses and associated habitats are critical to their viability. These corridors harbor federally threatened spotted owl, Chinook and coho salmon, steelhead trout, bull trout and their designated critical habitats. Other regionally important species include Harlequin duck, Copes' giant salamander, redtree vole, redband trout, cutthroat trout, and pacific lamprey. They are managed as wild fish safe-havens and provide critical migration corridors or habitat for a full complement of native species within close proximity to the Portland/Vancouver metropolitan area.

Fisheries Evaluation Criteria

Fish values may be judged on the relative merits of either fish populations, habitat, or a combination of these river-related conditions.

Populations: The river is nationally or regionally an important producer of resident and/or anadromous fish species. Of particular significance is the presence of wild stocks and/or federal or state listed (or candidate) threatened, endangered or sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of outstandingly remarkable. Specific evaluation criteria are as follows:

- Wild fish presence (robust wild populations not influenced by hatcheries);
- Native spawning (fisheries);
- Diversity (genetic isolation or species abundance); and/or,
- Threatened and endangered species presence and/or density.

Habitat: The river provides exceptionally high quality habitat for fish species indigenous to the region of comparison. Of particular significance is habitat for wild stocks and/or federal or state listed (or candidate) threatened, endangered or sensitive species. Diversity of habitats is an important consideration and could, in itself, lead to a determination of outstandingly remarkable. Specific evaluation criteria are as follows:

- High quality habitat as a critical migration corridor for fisheries;
- Diverse suite of habitat types; and/or,
- High quality habitat having core spawning or rearing areas.

Wildlife Evaluation Criteria

Wildlife values may be judged on the relative merits of either terrestrial or aquatic wildlife populations or habitat or a combination of these conditions.

Populations: The river, or area within the river corridor, contains nationally or regionally important populations of indigenous wildlife species. Of particular significance are species considered to be unique, and/or populations of federal or state listed (or candidate) threatened, endangered or sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of outstandingly remarkable. Specific evaluation criteria are as follows:

- Diversity (genetic isolation or species abundance);
- Threatened and endangered species presence and/or density; and/or,

- Unique wildlife species presence and/or density.

Habitat: The river, or area within the river corridor, provides exceptionally high quality habitat for wildlife of national or regional significance, and/or may provide unique habitat or a critical link in habitat conditions for federal or state listed (or candidate) threatened, endangered or sensitive species. Contiguous habitat conditions are such that the biological needs of the species are met. Diversity of habitats is an important consideration and could, in itself, lead to a determination of outstandingly remarkable. Specific evaluation criteria are as follows:

- High quality habitat as a critical migration corridor for wildlife;
- Diverse suite of habitat types; and/or,
- Contiguous habitat conditions for wildlife.

Historic and Prehistoric

Human use can be broken into two periods— prehistoric and historic. The prehistoric period covers uses by American Indians before Euro-American settlement. The historic period covers early contact between American Indians and Euro-Americans and Euro-American uses. Cultural resource sites located within the river corridors reflect the various uses during these eras.

Historic

Historic values in the region include transportation corridors such as Barlow Road, transient uses such as exploration and recreation, human occupation including homesteading and forest administrative facilities, and commodity extraction including logging, mining, grazing, trapping and water use.

Evaluation Criteria

The river or area within the river corridor contains sites or features associated with a significant event, an important person, or a cultural activity of the past that was rare, unusual, or one-of-a-kind in the region. Historic sites or features in most cases are 50 years old or older. Of particular significance are sites or features listed in, or are eligible for inclusion in, the National Register of Historic Places.

Prehistoric

Prehistoric values in the forest river systems are present in various cultural sites that exhibit use by Native Americans. The Mt. Hood National Forest is a meeting place for the Columbia Plateau, Northwest Coast, and Great Basin culture areas. In general, the archaeological record reflects differential use of the landscape favoring sustained or repeated occupation of flat ground in or near low maturity habitats adjacent to anadromous fish-bearing streams, near special use or resource procurement areas along transportation corridors. Prehistoric sites reflect the various aspects and types of culture use and include seasonal camps, lithic scatters, large dart points, small and delicate arrow points, peeled cedar trees, and berry hearths.

Evaluation Criteria

Sites must have rare or unusual characteristics or exceptional human interest values. Sites may have national or regional importance for interpreting ethnography; may be rare and represent an area where a culture or cultural period was first identified and described; may have been used concurrently by two or more cultural groups; or, may have been used by cultural groups for rare or sacred purposes.

Macroinvertebrates (Other Value)

Headwaters on the forest provide high quality habitat for many regionally and nationally significant macroinvertebrate species. These native species are self-sustaining and the river courses and associated habitats are critical to their viability. These corridors harbor species that are not found anywhere else in the world and endemic to the forest. Important macroinvertebrate species include the endemic Scott's apatanian caddisfly (*Allomyia scotti*), Green Springs Mountain farulan caddisfly (*Farula davisii*), and the Columbia Gorge caddisfly (*Neothrema andersoni*). These waterways provide important habitat for a full complement of native macroinvertebrate species within close proximity to the Portland/Vancouver metropolitan area.

Evaluation Criteria

These values may be judged on the relative merits of either macroinvertebrate populations, habitat, or a combination of these river-related conditions.

Populations: The river is nationally or regionally a producer of important macroinvertebrate species. Of particular significance is the presence of federal or state listed (or candidate) threatened, endangered or sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of outstandingly remarkable. Specific evaluation criteria are as follows:

- Diversity (genetic isolation or species abundance);
- Threatened and endangered species presence and/or density; and/or,
- Endemic to the Mt. Hood National Forest or the region.

Habitat: The river provides exceptionally high quality habitat for macroinvertebrate species indigenous to the region of comparison. Of particular significance is habitat for federal or state listed (or candidate) threatened, endangered or sensitive species. Diversity of habitats is an important consideration and could, in itself, lead to a determination of outstandingly remarkable. Specific evaluation criteria are as follows:

- High quality habitat as a critical link for persistence of the species; and/or,
- Diverse suite of habitat types.

Botany (Other Value)

The westside river corridors include forest habitat that is botanically and ecologically remarkable. It contains a substantial amount of old-growth forest (both riparian and upland stands); a suite of native plant communities; a diversity of plants and animals; and acts as a refuge for rare and uncommon botanical species (vascular plants, lichens, bryophytes, and fungi). This habitat type can be found in the Collawash River, South Fork Clackamas River, Eagle Creek, Fish Creek, South Fork Roaring River and Zigzag River. This habitat is where cold water corydalis (*Corydalis aquae-gelidae*), which grows along streams in late-successional/old-growth riparian forest, can be found. The East Fork Hood River and its immediate environment in the upper corridor also provides important botanical habitat on the forest. It provides important high-quality riparian habitat. In addition, in the lower-mid river corridor, moist basalt rock outcrops provide high-quality habitat for violet suksdorfia (*Suksdorfia violacea*). Throughout the river corridor, there are numerous wetlands, streams, and side channels that support diverse plant communities, some within late-seral forest habitat suitable for a variety special status botanical species. The corridors provide high quality habitat for botanical species within close proximity to the Portland/Vancouver metropolitan area.

Evaluation Criteria

Botany values may be judged on the relative merits of either botanical populations or habitat or a combination of these conditions.

Populations: The river, or area within the river corridor, contains nationally or regionally important populations of indigenous plant species. Of particular significance are species considered to be unique and/or populations of federal or state listed (or candidate) threatened, endangered, or sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of outstandingly remarkable. Specific evaluation criteria are as follows:

- Nationally or regionally important populations of indigenous plant species that are unique, rare and endemic, and/or exemplary; and/or,
- Diversity of species.

Habitat: The river, or area within the river corridor, provides exceptionally high quality habitat for plant species indigenous to the region. Of particular significance is habitat for federal or state listed (or candidate) threatened, endangered or sensitive species. Diversity or uniqueness of habitats is an important consideration and could, in itself, lead to a determination of outstandingly remarkable. Specific evaluation criteria are as follows:

- High quality habitat for indigenous species, including habitat for rare and endemic species;
- Diversity of habitats; and/or,
- Uniqueness of habitats.

Overarching Water Quality Protections

The Forest Plan was amended by the “Record of Decision for Amendments to Forest Service and Bureau of 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” ([Northwest Forest Plan](#)) in 1994. The Northwest Forest Plan allocations within the majority of the designated interim wild and scenic river corridors are managed under the Riparian Reserve standards and guidelines, which offers protections to water quality and free flow. Riparian Reserves include areas along rivers, streams, wetlands, ponds, lakes, and unstable or potentially unstable areas where the conservation of aquatic and riparian-dependent terrestrial resources receives primary emphasis.

Riparian Reserves are designed to protect the health of the aquatic system and its dependent species (USDA Forest Service and USDI Bureau of Land Management 1994, page 7). The standards and guidelines include the Aquatic Conservation Strategy, which was developed to restore and maintain the ecological health of watersheds and aquatic ecosystem. The strategy also protects salmon and steelhead habitat on federal lands managed by the Forest Service and Bureau of Land Management within the range of Pacific Ocean anadromy. The standards and guidelines for Riparian Reserves includes the following general riparian area management standard which is compatible with the free flow requirements of the Wild and Scenic River Act.

RA-1. Identify and attempt to secure in-stream flows needed to maintain riparian resource, channel conditions, and aquatic habitat.

In addition, the national best management practices for water quality management (USDA Forest Service 2012) and the memorandum of understanding between the State of Oregon Department of Environmental

Quality and the Forest Service Pacific Northwest Region (USDA Forest Service 2015) protect water quality in all designated segments. The national best management practices focuses on protecting water quality while implementing numerous, diverse activities across the landscape. The memorandum of understanding helps to implement these national best management practices with the purpose to “prevent, reduce, eliminate, or remediate point and nonpoint source water pollution and, where necessary, improve water quality to support beneficial uses” (page 2).

Lastly, the Watershed Condition Framework focuses on implementing integrated, whole watershed restoration programs in priority watersheds on the National Forest System lands (Potyondy and Geier, 2011). The nine designated Omnibus river segments consist of twelve sub-watersheds (6th field watersheds¹). These watershed conditions were evaluated as part of the Watershed Condition Framework. As shown in Table 3, ten were identified as functioning properly and two were identified as functioning at risk in the most recent reporting available: Headwaters Fifteenmile Creek and Lower Middle Fork Hood River. A rating of properly functioning is synonymous with being in good condition, which is “the expected indicator value in a watershed with high geomorphic, hydrologic, and biotic integrity relative to natural potential condition” (Potyondy and Geier, 2011, page 9). A rating of at risk is synonymous with fair condition, which is “the expected indicator value in a watershed with moderate geomorphic, hydrologic, and biotic integrity relative to natural potential condition” (Potyondy and Geier, 2001, page 9).

Table 3. Summary of Watershed Condition Framework for Designated Omnibus River Segments

River Segment	6 th Field Watershed	Overall Watershed Condition Rating	Water Quality Condition	Water Quantity Condition
Collawash River	Farm Creek-Collawash River	Functioning Properly	Fair	Good
Collawash River	Happy Creek-Collawash River	Functioning Properly	Good	Good
Collawash River	East Fork Collawash River	Functioning Properly	Good	Good
Eagle Creek	Upper Eagle Creek	Functioning Properly	Good	Good
East Fork Hood River	Upper East Fork Hood River	Functioning Properly	Fair	Good
Fifteenmile Creek	Headwaters Fifteenmile Creek	Functioning at Risk	Fair	Poor
Fish Creek	Fish Creek	Functioning Properly	Fair	Good
Middle Fork Hood River	Lower East Fork Hood River	Functioning Properly	Good	Good
Middle Fork Hood River	Lower Middle Fork Hood River	Functioning at Risk	Fair	Poor
South Fork Clackamas River	South Fork Clackamas River	Functioning Properly	Good	Good
South Fork Roaring River	Roaring River	Functioning Properly	Good	Good
Zigzag River	Zigzag Canyon	Functioning Properly	Good	Good

¹ Sixth field watersheds or 6th level hydrologic unit code (HUC) are typically 10,000 to 40,000 acres in size.

The water quality condition was rated as good in seven watersheds and fair in five; and, the water quantity condition was rated as good in ten of the watersheds and poor in two (see Table 3). Headwaters Fifteenmile Creek also has a fair rating for aquatic habitat condition, road and trail condition, and fire effects/fire regime condition. Lower Middle Fork Hood River also has fair ratings for aquatic biota condition, aquatic habitat condition, soil condition, forest cover condition, and fire effects/fire regime condition, and a poor rating for road and trail condition.

Each of these designations and programs offers water quality protection to the wild and scenic river segments discussed in this report and provide the foundation for the water quality descriptions for each river. Water quality is discussed in more detail for each river in the following sections.

Collawash River

Findings Summary: Geology and fisheries are outstandingly remarkable values for segments 1 and 2 of the Collawash River. These wild and scenic river segments include the full suite of native species; Endangered Species Act-listed fish and their critical habitat are present as well. Geology/hydrology include large, deep-seated earthflows that are very active. They are regionally significant providing textbook examples easily observable as you travel through the area. Botany and recreation are outstandingly remarkable values for segment 1. High quality habitat for cold water corydalis, a Forest Service sensitive species that is critically imperiled in Oregon, make segment 1 outstandingly remarkable from a botanical standpoint. Recreation is an outstandingly remarkable value because it provides a unique and challenging experience for kayakers.

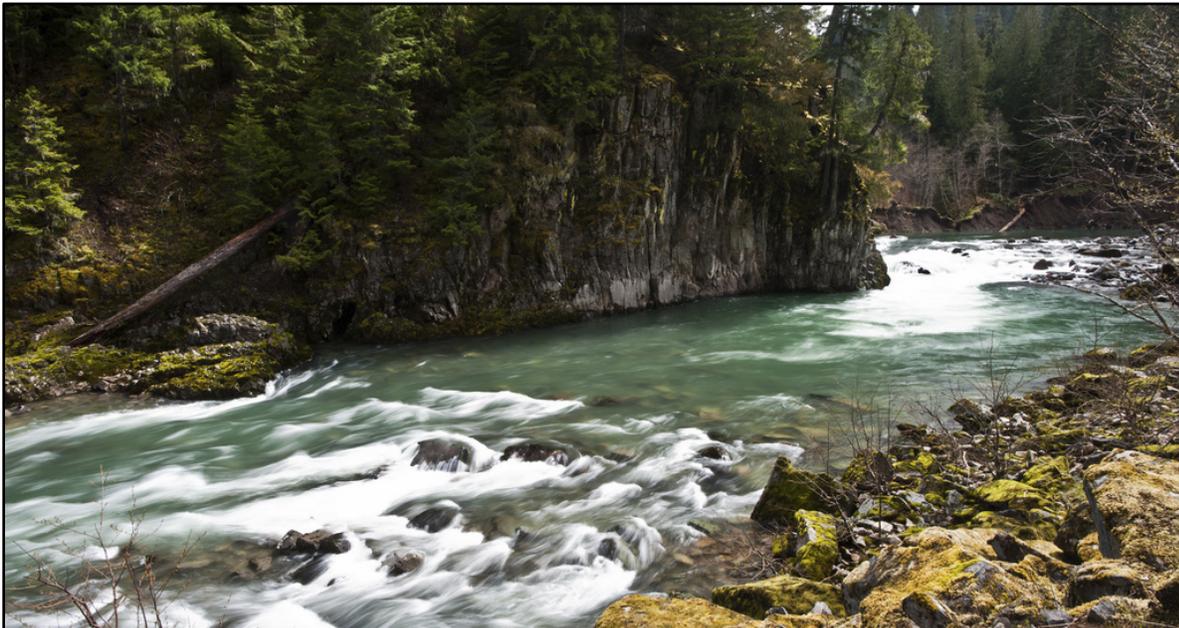


Figure 1. Collawash River, Segment 2

River Description

The Collawash River is a major tributary to the Clackamas River, generally oriented south to north, on the western slopes of the Cascade Range in northwest Oregon (see Map 2).

Segment 1

This designated segment flows between about 4,000 and 1,900 feet above mean sea level. It is mostly a 3rd and 4th-order perennial reach that originates from headwater springs and wetlands. Within this segment the Collawash River changes name to the East Fork Collawash above its confluence with Elk Lake Creek. The segment falls within the East Fork Collawash and Happy Creek-Collawash subwatersheds (12th-field Hydrologic Unit Codes (HUC) 170900110105 and 170900110106 respectively). The contributing watershed area is mountainous, with a dendritic stream network comprised of many named tributaries. Portions of this segment are within the Bull of the Woods Wilderness additions that were designated in the Omnibus Act.

The Collawash River within this segment has a confined channel with moderate to steep gradient. It flows through a narrow, steeply sloped, well-dissected canyon that contains several cliffs and talus slopes. The channel is rocky with many large boulders and pools. In one location, it flows over a waterfall approximately 20-feet high. Most of this segment is not in sight of, nor accessible by a road or trail.



Figure 2. Textbook Example of Earthflow in Segment 2 (as seen from Forest Service Road)

Segment 2

Segment 2 of the Collawash has a very confined channel, dominated by a low to moderate gradient. This segment has a number of unstable earthflows, one of which is considered a "textbook" (an easily interpreted) example by geologist and geomorphologists. Most of the length of this segment is visible from Forest Service Road 63 along which there are a number of developed and undeveloped riverside campsites featuring large, quality pools that are enjoyed by recreational users.

The elevation of this segment ranges between about 1,900 and 1,500 feet. Segment 2 is mostly a 5th and 6th-order perennial reach. The segment lies within the Farm Creek-Collawash River subwatershed (12th-field HUC 170900110107). The contributing watershed is mountainous, with a dendritic stream network comprised of many named tributaries, the largest of which is the widely recognized Hot Springs Fork.

Discussion of River Values

Free-flow Condition

There are no stream gages on these segments, and no known instantaneous streamflow records; although there are several gages far downstream on the Clackamas River. Generally, peak flows for this basin occur in the winter and early spring months in response to heavy precipitation, runoff, and snowmelt, while base flows typically occur during late summer and early fall.

Segment 1 is considered to be free flowing as there are no human-made impoundments or diversions and it is unregulated. There are two road crossings within this segment; one has a culvert in the first-order headwater reach, and the other has a bridge with slightly impinging abutments over the mainstem.

Naturally occurring barriers to navigation are present in the channel, such as large and small log jams, recurring beaver dams, and a steep, highly incised cascade reach just downstream from the confluence with Dickey Creek.

Similarly, segment 2 is considered to be free flowing as there are no human-made impoundments or diversions and it is unregulated. There are two road crossings within this segment; both are bridges with slightly impinging abutments. There is a single road immediately adjacent to the entire reach. Sections of it impinge upon the banks and channel. There is a 50-foot vertical waterfall in the upper reach of the segment above the confluence with the Hot Springs Fork, and above that, some naturally occurring small log jams.

All existing water rights were transferred in 1966 to in-stream beneficial uses for both segments. Allotted flow volumes vary from 10 to 250 cubic feet per second depending on the time of year and water right.

Water Quality

Water quality data for these segments of the Collawash are limited. Overall, water quality is considered to be good, and no exceedance for pollutants have been detected. The segment is not on the Oregon Department of Environmental Quality 303(d)² list of impaired waters. There is, however, a total maximum daily load³ for temperature. Stream temperature data compiled by the Forest Service's Aquatic and Riparian Effectiveness Monitoring Program indicate that exceedance of the Oregon Department of Environment Quality's seven-day maximum standard for cold-water fish has been observed several times during late summer months. (For more information on this cold water standard see Section 11 of the Oregon Department of Environmental Quality, Chapter 340, Division 41, Water Quality Standards: Beneficial Uses, Policies, And Criteria For Oregon, 340-041-0028, Temperature.)

² . Section 303(d) of the Clean Water Act requires the Environmental Protection Agency or delegated states, such as Oregon, to prepare a list of water bodies where these violations occur. The resulting list (the "303(d) list") is a comprehensive catalog of all waterbodies in the state that fail to meet one or more water quality criteria based on available data.

³ A total maximum daily load is a regulatory term in the U.S. Clean Water Act, describing a plan for restoring impaired waters that identifies the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.

Sediment is not considered to be a pollutant for segment 1. The terrain in the watershed however is inherently prone to mass wasting, and there are a half-dozen large earthflow features that are sources of large, naturally episodic pulses of sediment.

Similarly, sediment is not considered to be a pollutant for segment 2. The terrain in the watershed, however, is also inherently prone to mass wasting which contribute (naturally occurring) episodic pulses of sediment during high flows; the exposed toes of large earthflow features (which form portions of the river's eastern banks) are highly visible from the adjacent road. Yet, there often exists a remarkable clarity in the water with a noticeable quality of greenish color.

Timber harvest and road construction in past decades was extensive in the watershed, and there is a high likelihood that varying degrees of additional sediment has been contributed over time. Efforts to alleviate those effects began in earnest in the mid-1990s, which included closing and decommissioning many miles of road. A moderately high density of roads in the upper tributary reaches of the watershed remain, as well as many plantations of a comparatively young age. Continued road maintenance and efforts to disconnect the transportation system from the hydrologic network will help to minimize anthropogenic sediment sources.

Outstandingly Remarkable Values

Recreation

Evaluation of Present Situation

Segment 1: The river flows over and around many rocks, through pools, and over one waterfall approximately 20 feet high. While there are few, if any long distance views from the canyon, the combination of cliffs and the river with its large rocks, pools and cascades provides substantial photo opportunities.

Recreational use within the corridor is primarily dispersed in nature such as camping, hiking, and fishing and expert kayaking. Seasonal use is relatively moderate, with high use during peak summer holidays. Users are primarily local in nature, but some travel from other places within the state to experience the rare and unique kayaking opportunities offered in this segment.

Segment 2: This segment along the river receives a variety of heavy recreational use. The road along the lower half of the segment is traveled by many people from around the state on their way to Bagby Hot Springs, a regional attraction. The lower portion of the corridor contains developed recreational amenities. While the river is not considered a major rafting river, there are areas where recreationists use kayaks and small rubber rafts to play on the river.

There is also some fishing and hiking that takes place along the river. Users are primarily from the local area, but with the travel route to Bagby Hot Springs going through the corridor, there is use by recreationists from around the region. There are unique earthflows and other geologic features along the river that provide a potential interpretive opportunity.

Finding for Segment 1

Segment 1 of the Collawash River is popular for local use, and can draw advanced recreationalist looking for a high quality and challenging run (see Figure 3). What makes Segment 1 unique for recreation is the challenge it provides to expert kayakers. This is due primarily to the geology of the area allowing for a

change in experience nearly every time it is rafted. The remoteness and challenge of this segment make recreation an outstandingly remarkable value.

Finding for Segment 2

Segment 2 is popular for local use, but not necessarily a river dependent draw to the area. There are three developed campgrounds within the corridor, which allow for moderate recreational use. While the area provides recreation opportunities to the local community, it is not found to be an outstandingly remarkable value.



Figure 3. A Paddler navigates a large bedrock and boulder enhanced feature on the rapid named “The Churn” that changes in difficulty and appearance somewhat frequently due to erosion and rockslide from the geologically active banks. (Photo received from American Whitewater.)

Scenery

Evaluation of Present Situation

The Collawash River is a major tributary to the Clackamas River on the west slopes of the Cascade Range in northwest Oregon. Segment 1, totals 11.0 miles; running from the headwaters to Buckeye Creek. This section runs through a narrow, steeply sloped, well-dissected canyon that contains several cliffs and talus slopes. The river flows over and around many rocks, through pools and over one waterfall approximately 20-feet high.

The overall appearance along the segment is a natural forested setting. The seasonal variations are typical to the region of comparison, with a combination of plantation stands, older mixed conifer, and some maple and alder which contribute to seasonal color changes. The vegetative pattern is considered relatively common for the region. While there are few, if any long distance views from the canyon, the combination of cliffs and the river with its large rocks, pools and cascades provides photo opportunities.

Segment 2 flows through a narrow, well dissected river canyon containing cliffs and talus slopes throughout the segment. There is also a large earthflow next to the river which is a point of interest. There is a potential interpretive opportunity sharing about the earthflows and other geologic features along the river. This opportunity is considered to be primarily of local importance with some users coming from around the region. The river flows over and around many rocks, forming pools and cascades. The vegetative pattern is considered relatively common for the region. The presence of the road and associated harvest units reduces the visual quality. The river and related landform does provide photo opportunities, though they are not considered outstanding.

Finding for Segment 1 and 2

While both segments of the Collawash are pleasing, and there are indications the area is photographed by the visitors, the segments did not stand out as highly memorable, highly diverse, or uncommon when compared to other rivers within the region of comparison. The scenic resources were not found to be rare, unique, or exemplary for the area. The earthflow was identified as a curiosity, but it was not seen as a contributing scenic feature to the area. As such, scenery was not identified as an outstandingly remarkable value.

Geology/Hydrology

Evaluation of Present Situation

Most of the watershed lies within the Western Cascade physiographic province, a thick sequence of interbedded lava flows, pyroclastic flows, and volcanic deposits. This material erupted from volcanic vents of the ancestral Cascade Range about 20 to 4 million years ago to a thickness of over 15,000 feet. The volcanic strata have been uplifted, faulted, and warped by tectonic forces and intruded by numerous dikes, sills, and small stocks. The largest intrusions in the watershed are the Bull of the Woods intrusive complex and the Austin Point intrusion, both of which may be the remnant cores of source areas for some of the Western Cascade rocks.

Finding for Segment 1 and 2

Segments 1 and 2 contain a number of very large, active earthflows, representing “textbook” examples that are easily interpreted in the field. Earthflows within segment 1 are only visible from the river (see Figure 3), while those in segment 2 are easily observable from Forest Service Road 63 (see Figure 2). Intense precipitation events lead to increased river flows, and subsequently, the river’s erosive potential. During periods of increased runoff, the river actively cut’s into the toe of the earthflows, accelerating their rate of downslope movement. The dynamic relationship between the river and the earthflows results in constant rearrangement of the river channel, and is not something found within the region of comparison. Because of this, and the fact that earthflows of this size are not typically found within the region of comparison, geology is found to be an outstandingly remarkable value.

Fisheries

Evaluation of Present Situation

Fish Populations

The Collawash River contains a unique diversity of wild fish stocks that includes anadromous salmonids (late-run coho, winter steelhead, and spring Chinook), a recently re-introduced population of bull trout, as well as coastal cutthroat trout. All of these species are on federal or state lists as threatened or sensitive species due to declining populations range-wide. Although not yet documented in the Collawash, suitable habitat is available for Pacific lamprey, a state-listed sensitive species. It is expected that this species will progressively re-colonize historic habitat of the upper Clackamas tributaries due to targeted lamprey passage improvement projects at downstream dams completed in the last decade. Rainbow trout, mountain whitefish, mountain sucker, longnose dace, and sculpins are also known to occur in the Collawash, though there is little documented information on their abundance and extent of upstream distribution in these segments.

The Clackamas River late-run coho is considered the last viable wild coho stock in the Columbia River basin (Nehlsen et al. 1991). For reference, the 2015 population status review concluded that the vast majority (over 90 percent) of historical populations remaining in the Lower Columbia River coho salmon Evolutionarily Significant Unit appeared to be either extirpated or nearly so given the high proportion of hatchery spawners that dominated many of the coho populations, and that there was little natural productivity (Northwest Fisheries Science Center 2015). Native coho stocks that once ranged into the Snake River and mid-Columbia tributaries of the Columbia River Basin are now extinct above Bonneville Dam. Similarly, Clackamas River spring Chinook were rated as one of only two remaining natural runs in the Willamette basin with the least hatchery influence, and is thus a natural population stronghold. Of the tributaries, the Collawash River is the most used by spring Chinook in the Clackamas River Basin for spawning (Northwest Power and Conservation Council 2004). Review of winter steelhead stocks in the Lower Columbia River Evolutionarily Significant Unit noted that for most populations, total abundances and natural-origin abundances (where available) have remained low, averaging in the hundreds of fish. Notable exceptions to this were the Clackamas and Sandy River winter-run steelhead populations that are exhibiting recent rises in abundance and maintaining low levels of hatchery-origin steelhead on the spawning grounds.

Bull trout were historically present in segment 2, and were likely historically present in segment 1 (Shively et al. 2007). Similar to many other watersheds in its native range, this species was considered extirpated in the Clackamas River Basin by the 1970's. Range-wide, bull trout are native throughout the Pacific Northwest and historically occurred throughout the Columbia River Basin, east to western Montana, south to the Jarbidge River in northern Nevada, the Klamath Basin in Oregon, the McCloud River in California and north to Alberta, British Columbia and possibly southeastern Alaska. Although the species was once abundant and widespread, bull trout now exist primarily in upper tributary streams and several lake and reservoir systems. The main populations remaining in the lower 48 states are in Montana, Idaho, Oregon and Washington with a small population in northern Nevada. Bull trout have been extirpated from California. Beginning in 2011, an interagency effort reintroduced bull trout to the upper Clackamas River from the McKenzie River donor population. Surveys have detected radio-tagged adult bull trout in the lowermost segment of the Collawash River in 2013 and 2014. Although stream temperatures are not ideal for spawning in all years, the Collawash supports important foraging habitat, and potentially rearing habitat for bull trout. This successful re-introduction plan is unique in being the only known range-wide attempt to return a bull trout population to its historically occupied watershed.

Pacific lamprey in the Columbia River Basin have declined to a remnant of their historical abundance. The Willamette Basin, which includes the Collawash River in the headwaters, has one of the largest remaining adult returns in the Columbia River system (Kostow 2002). Within the Willamette Sub-Unit, ladder improvements by Pacific Gas and Electric at River Mill, Faraday, and North Fork Dams on the lower mainstem Clackamas River, as well as the installation of ramps at River Mill and North Fork Dams, have successfully increased adult lamprey passage on the Clackamas River upstream of North Fork Dam (US Fish and Wildlife Service 2015)

The Collawash River is the largest tributary in the upper Clackamas River watershed. Since 1999, the upper Clackamas (upstream of Pacific Gas and Electric's North Fork Dam) has been managed as a wild fish sanctuary by the Oregon Department of Fish and Wildlife. At this time, all anadromous salmonids identified as hatchery origin (i.e., those that are adipose fin clipped), are captured at the North Fork Dam fish trap and prevented from migrating past the dam into the upper river. To further support wild fish protection goals, this upper river reach has also been closed to all salmon and steelhead fishing since 1998. In 2010, the new federal license for the Clackamas River Hydroelectric Project has started to improve both upstream and downstream passage at mainstem Clackamas River facilities, increased minimum flow in the Oak Grove Fork (high quality tributary to the Clackamas River), as well as dedicated several million dollars to habitat restoration in the Clackamas watershed. These improvements will benefit the overall fish production and habitat quality in the watershed, and will likely translate to increased fish utilization within the Collawash segment.

Introduced fishes are not a significant concern except where they have migrated out of several high lakes where they were (or still are) planted for recreational fisheries. Non-native brook trout pose a future threat to native cutthroat, rainbow, and bull trout through predation and competition for food and available habitat if they expand their distribution. Brook trout could also hybridize with bull trout, which is an additional threat. At this point, it does not appear that introduced fishes compete well against native fish in undisturbed portions of habitat in the Collawash, but there are subwatersheds where they have naturalized.

Fish Habitat

Aquatic and riparian habitat in the Collawash River is generally in excellent condition, except in few localized areas of disturbance due to recreational activity (segment 2) and residual effects from past timber harvest. As the largest tributary in the upper Clackamas Basin, the Collawash River is a key area for survival and recovery of federal and state listed-fish in the Clackamas River Basin. The East Fork Collawash probably naturally contributes to higher water temperatures despite having a relatively undisturbed riparian zone. Timber harvest and road building have occurred; however, since much of this watershed is in steep inaccessible canyons, few roads have been built near the stream except in the lower Collawash from the mouth to Fan Creek. The river provides high quality habitat for fish species indigenous to the region. Of particular significance is habitat for wild stocks considered unique, and populations of federal or state listed threatened or sensitive status species.

Habitat changes quickly in the Collawash because of the flashy nature of the hydrograph with periods of high run off and high turbidity caused by rain on snow events during the fall and winter. Habitat in the main stem Collawash appears to meet standards for large wood and fail to meet standards for pools.

Naturally, unstable geology, primarily in the lowermost segment below Buckeye Creek, as well as anthropogenic sources contribute to elevated sediment and turbidity in the Collawash. The degree to which the elevated sediment and turbidity can be attributed to road building or impacts to fisheries is uncertain.

The range of fish use of the Collawash has not changed significantly. Steelhead have probably always had access to the upper Collawash, but a passage improvement project in the late 1980's has improved adult passage at Collawash Falls at river mile 7.4 (segment 1), especially for Chinook and coho. Some habitat has been lost because of impassable road culverts, but these affect resident, not anadromous fish. The impassable culverts are located at Perry, Sand, Paste, Peat, Happy, and Blitzen Creeks.

The Collawash provides diverse, quality habitat for threatened and sensitive species that helps support the goals of the upper Clackamas as a wild fish sanctuary.

Finding for Segment 1 and 2

In both Collawash segments, the significance of the vestige wild fish populations, wild fish species diversity, success of the bull trout re-introduction to their historic habitat, and the management of this segment as a wild fish sanctuary is extremely unique within the region of comparison. As such, fisheries is a outstandingly remarkable value for both segments.

Wildlife

Evaluation of Present Situation

Both Collawash River segments contain quality riparian habitat, including large tracts of late-successional stands and beaver colony presence, which contributes to a high diversity of wildlife species present. One federal threatened species is found in these segments, the northern spotted owl. There are four northern spotted owl core nest areas as well as portions of two additional northern spotted owl home ranges.

Nearly the entire river segment is considered suitable or dispersal northern spotted owl habitat. The entire river segment is either in wilderness or within designated northern spotted owl critical habitat.

One Forest Service sensitive species, the harlequin duck, was found during surveys in the early 1990s. However, they were not found in a more recent 2013 survey. Three other management species are known to inhabit this area, the pileated wood pecker (forest management indicator species), pine marten (forest management indicator species), and red tree vole (Northwest Forest Plan survey and manage species). There is one active osprey nest in the river corridor. Most of the river segments are considered deer and elk winter range, although around 2.2 miles of segment 2 is immediately adjacent to Forest Service Road 63, which gets heavy use, even in winter, and is devoid of needed vegetated screening habitat.

Finding for Segment 1 and 2

Although the Collawash River corridor contains quality riparian habitat and diverse wildlife species, this diversity is commonly found on other river corridors elsewhere on the Mt. Hood National Forest, as well as other rivers with the region of comparison. Neither wildlife species nor habitat is found to be an outstandingly remarkable value on the Collawash River segments.

Historic

Evaluation of Present Situation

The greater Clackamas River drainage and its tributaries represent an important river systems in the northern Oregon Cascades. The resources supplied by this system and its surrounding mountains have sustained human populations in the region for up to 10,000 years. Confluence of two rivers, Clackamas and Collawash, and the nearby activity represented in sites suggests this area was exposed to intensive use. Historic sites reflect the economic importance of the river drainage to early immigrant populations. Early trails and bridges provided access to the area for early homesteaders, loggers and Forest Service personnel.

Finding for Segment 1 and 2

Based on the initial research, the historic resources are not unique within the region of comparison. There are many sites along this river corridor, but there is nothing that is extraordinary that you cannot find elsewhere, no eligible or listed sites, or any intact visible resources. As such, this segment did not meet the criteria for an outstandingly remarkable value for historic resources.

Prehistoric

Evaluation of Present Situation

The greater Clackamas River drainage and its tributaries represent one of the most important river systems in the northern Oregon Cascades. The resources supplied by this system and its surrounding mountains have sustained human populations in the region for up to 10,000 years.

The confluence the Clackamas and Collawash, and the nearby activity represented in sites suggests this area was exposed to intensive prehistoric use. Several sites in this segment are eligible for the National Register of Historic Places. Several sites provided data relevant to issues in chronology, settlement and subsistence, lithic technology, procurement and exchange.

There is evidence of prehistoric use of the river by Native Americans. Existing evidence of the use includes the presence of obsidian flakes and some peeled cedars in various locations throughout the corridor. There is strong evidence of important Native American camping sites particularly at the confluence of Collawash and Clackamas Rivers. At the headwaters, there is evidence of an important travel corridor. There are also some cabin sites that have been found, but most of the structures have deteriorated. They are not considered to be in good, interpretable condition, though they do have some local importance in interpreting the history of the area.

Finding for Segment 1 and 2

There is confidential prehistoric information that cannot be disclosed that is relevant to evaluating rivers for this value. No sites within this river corridor have rare or unique characteristics within the region of comparison. As such, prehistoric is not an outstandingly remarkable value.

Botany (Other Value)

Evaluation of Present Situation

Both river segments contain a substantial amount of old-growth forest (both riparian and upland stands); a number of native plant communities (plant associations), including regional priority habitats (i.e., special habitats) identified in the West Cascades ecoregion; a diversity of plants and animals; and act as a refuge for rare and uncommon botanical species (vascular plants, lichens, bryophytes, and fungi). Except for timber harvest and Forest Service roads and campgrounds, the river segments lack human settlement and development (anthropogenic disturbance) and are relatively free of adverse effects such as pollution that degrade plant habitat. Both segments offer visitors access to intact and relatively unspoiled riparian forest that includes late-successional/old-growth forest and a rich diversity of plant and animal species, including some rare taxa.

No federally-listed threatened or endangered plant species are documented within the segments. Two sensitive plant species on the Region 6 Regional Forester and Oregon/Washington State Director Special Status Species List (July 2015) are documented in the river segments: pale blue-eyed grass (*Sisyrinchium sarmmentosum*) and adder's-tongue (*Ophioglossum pusillum*). Pale blue-eyed grass is an iris species endemic to Washington and Oregon with a total of only 24 known locations, including some on the Mt.

Hood National Forest (Pale Blue-Eyed Grass Conservation Strategy 2011). The iris was petitioned for listing as a threatened species and is currently being reviewed and considered for threatened status by the U.S. Fish and Wildlife Service. Pale blue-eyed grass is primarily a wet meadow species, but it has also been found in a cluster of forest openings along a creek (Pinhead Creek), along the shoreline of a lake (Timothy Lake), and along a road (Gifford Pinchot National Forest). There are only 14 populations of adder's-tongue documented on National Forest System lands in Oregon (one on the Mt. Hood). The adder's-tongue in the Collawash River corridor is the only known (documented) site on the Mt. Hood National Forest. It straddles both river segments (northwest corner of segment 1 and southwest corner of segment 2). Segment 1 contains a portion of the designated Sugar Pine Botanical Area, the northernmost extent of the geographical distribution of sugar pine, as far as we know. Sugar pine is not a river-dependent or river-related species.

There is habitat for cold water corydalis (*Corydalis aquae-gelidae*), a sensitive species on the Region 6 Regional Forester and Oregon/Washington State Director Special Status Species List, and a Survey and Manage species (Northwest Forest Plan). Cold water corydalis is a river-related/river-dependent species. A number of cold water corydalis sites are documented relatively nearby in the upper Clackamas River. Oregon Biodiversity Information Center has documented cold water corydalis as vulnerable throughout its range (G3), critically imperilled in Oregon (S1) and species of concern. It is also a candidate for listing as threatened or endangered, and on List 1, threatened and endangered throughout its range. No sightings/occurrences of this species in the Collawash River are documented, but botany field surveys in this area are incomplete.

Cold water corydalis grows along streams of many sizes, from headwater seeps to large rivers (Goldenberg and Zobel 1999). Community composition ordinations indicate that species occurrence is highly correlated with dense western hemlock canopies at lower elevations and with Pacific silver fir and Sitka alder canopies at higher elevations, and, conversely, less so with less dense forest canopies found on larger rivers (e.g., western red cedar, red alder) (Goldenberg and Zobel 1999). Percent canopy cover appears to strongly affect the occurrence of cold water corydalis with its abundance significantly reduced in areas that have been clearcut (Goldenberg and Zobel 1999). The species seems best suited to habitats in which a high, partial canopy allows sufficient light for growth and reproduction, but hinders the establishment of competing vegetation (Montgomery et al. 2017). Cold water corydalis can be found in late-successional riparian forest, mostly in areas not recently subjected to catastrophic floods (Goldenberg and Zobel 1999). A large number of cold water corydalis populations have been documented in the relatively nearby upper Clackamas River, many in late-successional/old-growth riparian forest. The Collawash River segment includes reaches where past timber harvest (clearcuts and commercial thinning) has occurred as well as undisturbed late-successional/old-growth riparian forest.

Finding for Segment 1 and 2

The high quality habitat, including old growth riparian forest and stream temperature, for cold water corydalis within segment 1 of the Collawash River make this river segment outstandingly remarkable for botany. Cold water corydalis may be present in river segment 1, and is a river-related/ river-dependent species. This species is critically imperilled in Oregon. For these reasons, botany is an outstanding remarkable value for segment 1. By comparison, segment 2 does include the same high quality habitat because of warmer stream temperatures. As such, botany is not an outstandingly remarkable value for this segment.

Eagle Creek

Findings Summary: Recreation and botany are the outstandingly remarkable values for Eagle Creek. The river is very popular with the local equestrian communities and they have a special interest in the area. Equestrian trail use along the river is a unique characteristic, especially as an easy trail. Equestrian trails of this caliber are limited within the region of comparison; as such, people are willing to travel long distances for this experience. In addition, quality habitat for cold water corydalis, a Forest Service sensitive species that is critically imperiled in Oregon, within the Eagle Creek corridor make it outstandingly remarkable from a botanical standpoint.



Figure 4. Eagle Creek

River Description

Eagle Creek is a tributary of the Clackamas River in the western slopes of the Cascade Range in northwest Oregon (see Map 3). Eagle Creek flows to the west and joins the Clackamas River north of the town of Estacada, Oregon. The creek begins in a cirque-shaped headwater area flowing then through a steeply sloped "V" shaped valley that is heavily forested with older aged Douglas fir and hemlock. The creek contains some riffles, with numerous downed logs and pools. The segment falls within the Upper Eagle Creek subwatersheds (12th-field HUC 170900110501).

The presence of large, old trees and the lack of human alterations along the segment add to the visual quality of the river. Eagle Creek interim wild and scenic river corridor is entirely within the Salmon-Huckleberry Wilderness. The Eagle Creek Addition to the Salmon-Huckleberry Wilderness was designated in the Omnibus Act.

Discussion of River Values

Free-flow Condition

The watershed is mostly within the transient snow zone where snow falls and melts more than once per winter and rain-on-snow events are common. Base flows and peak flows are within the range of natural variability likely because there have been only limited management activities within the headwaters. Generally, low flows occur in the late summer, with a number of distinct storm events between October and April. High flows occur midwinter and during early spring. There are no U.S. Geological Survey gaging stations in the vicinity, but an automated water monitoring station was installed downstream of the designated river segment by the Forest Service in 2001 (the current status of the forest gage, however, is unknown and is likely not currently operating).

The designated segment of Eagle Creek is free flowing, as there are no human made impoundments or diversions, and it is unregulated.

Water Quality

Overall, water quality within the designated Eagle Creek segment is very good, likely because it is located within the Salmon-Huckleberry Wilderness. Eagle Creek is on the Oregon Department of Environmental Quality 303(d) list for bio-criteria (waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities); however, the samples used to assess this parameter were collected far downstream of the designated segment and so may not be representative of the segment's water quality (especially since the headwaters are within wilderness and are therefore not likely impaired). There is one hiking trail that parallels the creek, but it does not appear to be a sediment source. There is also a total maximum daily load for temperature (2006).

Outstandingly Remarkable Values

Recreation

Evaluation of Present Situation

Since Eagle Creek is entirely within the Salmon-Huckleberry Wilderness, uses are limited to wilderness-compliant uses, such as hiking, horseback riding, dispersed camping, nature viewing, paddling, and trout fishing. The main activity is hiking and horseback riding, but nature viewing, photography, and picnicking may be ancillary activities. There are some hiking trails in the river corridor, but most used in the snow-free season. The level of use in the area is light to moderate.

The visitor experience is likely high for those seeking solitude, with the area experiencing less visitation than other parts of the forest. There is likely little to no crowding or conflict issues for visitors, however, equestrian use is becoming increasingly more popular in the area. Local equestrian groups have a special interest in the area due to the easy trail grade and ease of use for horses. Equestrian trail use along the river is a unique characteristic for area because of old growth stands and the opportunities for solitude. Access to the area is limited because of the wilderness designation and limited trailhead facilities.

Finding

While this corridor lies entirely in wilderness, the attractions and unique experiences along the river draw a specific use that is not found in many areas throughout the region. Since equestrian trails of this caliber are limited within the region of comparison, people are willing to travel long distances to experience it. For that reason, recreation was found to be an outstandingly remarkable value for this river.



Figure 5. Forest Service Trail 501 at the Forest Boundary

Scenery

Evaluation of Present Situation

Eagle Creek has moderate scenic diversity, with some good views, with the possibility of having photo opportunities, but is not likely to be featured in publications. The creek flows through a steeply sloped V-shaped valley, which is heavily forested. The creek is described as having typical views, and limited long-range views due to the density of the forest.

The opportunities to enjoy views will be from the river itself, or the trail paralleling the river. Both locations provide views of classic western Cascade forested landscapes, with little variation, season changes, vistas, or opportunities for highly memorable or diverse views when compared to similar rivers in the region of comparison.

Finding

The scenic resources in Eagle Creek were not identified as outstanding based on the evaluation criteria, and therefore, scenery is not an outstandingly remarkable value for this river. While Eagle Creek provides unique recreation opportunities, and there are indications the area is photographed by the visitors, the segments did not stand out as highly memorable, highly diverse, or uncommon when compared to other rivers within the region of comparison. The scenic resources were not found to be rare, unique, or exemplary for the area.

Geology/Hydrology

Evaluation of Present Situation

Most of the watershed lies along the west front of the Western Cascade physiographic province. The headwaters are underlain predominantly by the approximately 4 to 15 million year old andesitic lava flows, tuffs, basalts and dacites of the Sardine Formation, which is the most common rock type from the North Santiam River to the Columbia River. Below the confluence with Bear Creek, the watershed is primarily underlain by terrace deposits that occur generally along the periphery of the Willamette Lowland, which include the Gresham, Estacada and Springwater deposits.

Finding

The creek starts in a cirque shaped headwaters and flows through a steeply sloped V-shaped canyon. Bedrock material is volcanic in origin that is common throughout the central cascades. There is the presence of alluvial fans at the base of side drainages flowing into the creek. There are a few rock outcroppings along the corridor. While the above features may not be found along all rivers throughout the region, they are still considered relatively common. Because these features are not unique within the region of comparison, geology does not represent an outstandingly remarkable value.

Fisheries

Evaluation of Present Situation

While the watershed supports anadromous fish species including winter steelhead, coho salmon and spring Chinook salmon, waterfalls above the hatchery at river mile 13 preclude any anadromous fish species from migrating further up the mainstem onto the designated segment of Eagle Creek. The wild and scenic river reach of the mainstem supports a healthy population of resident cutthroat trout that are likely to be genetically distinct due to the migration barrier of the falls above the hatchery, and the lack of any hatchery trout stocking in areas upstream of these falls. They have been isolated since the geological formation of the falls (USDA Forest Service 1995). There are not any special harvest restrictions in place because fishing pressure is believed to be low.

Human impact in this portion of Eagle Creek has been minimal. There is no road access due to the wilderness designations. Trails for hiking and equestrian activities exist within the 8.3 mile stretch and subsequently some rough camping spots are present, but not widespread. The streambed and banks are stable with healthy riparian vegetation that contributes to consistently cool water temperatures. The creek contains some riffles with downed logs, pools and abundant gravel distribution. Water quality and stream productivity are both high (USDA Forest Service 1990a). The upper mainstem of Eagle Creek indicates conditions that are conducive to sustaining a healthy trout population. Habitat complexity is high with abundant side channels, still water, spawning gravel, braided channels and woody debris. Stream banks are stable with low levels of sedimentation. Vegetation along the riparian zone of this upper reach is plentiful providing an overstory with good shade conditions. Timber harvest has occurred below the Salmon-Huckleberry Wilderness area of the upper reach, but this reach has now been designated as part of the wilderness.

Finding

Due to the historic presence of several downstream waterfalls, this Eagle Creek segment does not support any anadromous fish species. The existence of genetically pure wild native coastal cutthroat trout stock is important within this species range as many populations below impassable falls have succumbed to introgression with hatchery stock. As there are numerous other isolated cutthroat trout populations on the

forest, and certainly within the region of comparison, this fish resource is neither unique nor exemplary from a regional standpoint.

Wildlife

Evaluation of Present Situation

The Eagle Creek segment contains quality riparian habitat, with the area's remaining old growth stands contributing to the high wildlife species diversity in this area. Much of the watershed's remaining old growth stands can be found along this river segment and its tributaries.

One federal threatened species is found in these segments, the northern spotted owl. There are three northern spotted owl core nest areas as well as a portion of one additional northern spotted owl home range. Nearly the entire river segment is considered suitable northern spotted owl habitat. One Forest Service sensitive species, the Cope's giant salamander is known from the upper portion of the river segment. Habitat is suitable for harlequin duck (another Forest Service sensitive species), but no formal surveys have occurred and no incidental sightings have been recorded.

Three other management species are known to inhabit this area, the pileated woodpecker (forest management indicator species), pine marten (forest management indicator species), and red tree vole (Northwest Forest Plan survey and manage species). Small herds of deer and elk are present, concentrated in riparian areas. The lower two thirds of the river segment is considered deer and elk winter range, although many of the deer and elk tend to winter on adjacent private lands. The river segment is an important travel corridor for deer and elk. Overall, lack of forage keeps this area from sustaining larger populations of deer and elk.

Finding

Although the Eagle Creek corridor contains quality riparian habitat and diverse wildlife species, this diversity is can be found on other river corridors elsewhere on the Mt. Hood National Forest, as well as other rivers region-wide. Neither wildlife species nor habitat is found to be an outstandingly remarkable value on this river segment.

Historic

Evaluation of Present Situation

There is evidence of an old cabin site within the corridor. The remains of a cabin are located in the lower end of the corridor, and thought to have been used in the 1920s-1930s. There are no other known sites within the corridor though there may have been some transitory use by early homesteaders and explorers.

Finding

Although there is evidence of an old cabin site within the corridor, it was determined not to be of historical significance; therefore, Eagle Creek did not meet the criteria for an outstandingly remarkable value for historic resources.

Prehistoric

Evaluation of Present Situation

The river corridor is suspected to have been used in the past as an east/west transportation route, so this river segment is considered a high probability area. The Mt. Hood National Forest has not surveyed all of the area, but there is a high likelihood that we would find a high density of prehistoric sites.

Finding

There is confidential prehistoric information that cannot be disclosed that is relevant to evaluating rivers for this value. No sites within this river corridor have rare or unique characteristics within the region of comparison. As such, prehistoric is not an outstandingly remarkable value.

Botany (Other Value)

Evaluation of Present Situation

The river corridor has habitat for cold water corydalis (*Corydalis aquae-gelidae*), both a sensitive species on the Region 6 Regional Forester and Oregon/Washington State Director Special Status Species List and a Survey and Manage species (Northwest Forest Plan). Cold water corydalis is a river-related/river-dependent species. Cold water corydalis has been found in locations outside the corridor in tributaries to the creek. Oregon Biodiversity Information Center has documented cold water corydalis as vulnerable throughout its range (G3), critically imperilled in Oregon (S1) and species of concern. It is also a candidate for listing as threatened or endangered, and on List 1, threatened and endangered throughout its range. No sightings/occurrences of this species in the Eagle Creek are documented, but botany field surveys in this area are incomplete.

Cold water corydalis grows along streams of many sizes, from headwater seeps to large rivers (Goldenberg and Zobel 1999). Community composition ordinations indicate that species occurrence is highly correlated with dense western hemlock canopies at lower elevations and with Pacific silver fir and Sitka alder canopies at higher elevations, and, conversely, less so with less dense forest canopies found on larger rivers (e.g., western red cedar, red alder) (Goldenberg and Zobel 1999). Percent canopy cover appears to strongly affect the occurrence of cold water corydalis with its abundance significantly reduced in areas that have been clearcut (Goldenberg and Zobel 1999). The species seems best suited to habitats in which a high, partial canopy allows sufficient light for growth and reproduction, but hinders the establishment of competing vegetation (Montgomery et al. 2017). Cold water corydalis can be found in late-successional riparian forest, mostly in areas not recently subjected to catastrophic floods (Goldenberg and Zobel 1999). Eagle Creek includes reaches where past timber harvest (clearcuts and commercial thinning) has occurred as well as undisturbed late-successional/old-growth riparian forest riparian forest, where cold water corydalis habitat is present.

Finding

A botany survey of Eagle Creek done from the Eagle Creek Trail (#501) in November 2018 verified the presence of high-quality habitat (e.g., old-growth forest, low-gradient stream reaches, gravel bars) for cold water corydalis. The high quality habitat for cold water corydalis within Eagle Creek make this river outstandingly remarkable for botany. Cold water corydalis may be present in the river corridor, and is a river-related/river-dependent species.

East Fork Hood River

Findings Summary: Wildlife, recreation and botany are the outstandingly remarkable values for East Fork Hood River. The wild and scenic river corridor provides a critical travel (migration) corridor for deer and elk between winter and calving seasons. The corridor also provides habitat for the Harlequin Duck; this population is one of the largest on the Forest, potentially due to its proximity to the Columbia River and good quality connectivity to wintering grounds in the Pacific Ocean. Lastly, the corridor provides diversity of wildlife species, including threatened species, because of habitat quality within the wild and scenic river corridor. Recreation is an outstandingly remarkable value because of low impact recreation opportunities and unique whitewater opportunities. Botany is an outstandingly remarkable value because of the rare and uncommon plants that occupy the corridor, particularly the violet suksdorfia.



Figure 6. East Fork Hood River

River Description

The East Fork Hood River flows out of the Newton-Clark Glacier on the south face of Mt. Hood in the Cascade Range of Oregon (see Map 4). After flowing for about 2.5 miles toward the southeast, the river makes a sweeping turn to the north. Oregon State Highway 35 hugs the river after this turn. The river flows through a relatively broad valley bottom made up of glacial outwash before flowing into a narrower steep-sided canyon containing a number of cliffs. Due to the nature of the outwash, there are numerous

springs and small tributaries that flow into the river. The East Fork Hood River has a naturally high suspended sediment load, and lacks riparian vegetation due to the glacial nature of the river. The designated segment of the East Fork Hood River is located within the Middle and Upper East Fork Hood River subwatersheds (12th-field HUC 170701050502 and 170701050501 respectively).

Discussion of River Values

Free-flow Condition

The steep topography of the watershed results in a flashy hydrograph with brief but large peak flows. Runoff is especially rapid with early winter storms during which warm rain melts the existing snowpack. Periodically, natural dams created by the terminal moraines of Mt. Hood's receding glaciers break, causing outburst floods and debris flows. Peak floods generally occur during winter months, while base flows typically occur during September or October in many tributaries. Tributaries with glacial sources however maintain higher summer flows.

The U.S. Geological Survey does not have any gages on the East Fork Hood River; there is one gage site on the mainstem Hood River. Also downstream, the Confederated Tribe of the Warm Springs and Oregon Department of Fish and Wildlife collect flow data.

Within the greater Hood River Basin, there is currently a lack of adequate streamflow during the summer months to meet the competing demands for water downstream of the segment (Bureau of Reclamation 2015). This could be exacerbated by climate change. The basin's natural runoff is projected to increase during the fall and winter months and decrease during the spring and summer months when water uses are greatest. Hood River basin streamflow relies heavily on snowmelt at the beginning of summer and Mount Hood glacial melt during August and September. Warming temperatures in future years could increase the speed of snowpack and glacial melting. Glaciers and snowpack are expected to decrease in size and volume. Between 50 and 70 percent of flow during the irrigation season is provided from glacial melt; if the Mt. Hood glaciers were to fully recede, the basin would lose one of its largest water supplies (Bureau of Reclamation 2015).

The designated segment of the East Fork Hood River is free flowing, although some minor impingements are present. For a substantial portion of the designated river segment, Highway 35 parallels the East Fork and sections of rip-rap along the embankments result in minor constraints at higher flows. Where log jams accumulate at milepost 72, the Oregon Department of Transportation periodically removes them to prevent flooding of the road-way. A footbridge trail crosses the river; the crossing may slightly impound flows during floods. Other alterations within the designated segment include two campgrounds that encroach onto the floodplain of the East Fork Hood River as well as large woody debris installed for restoration purposes.

Within the designated segment of the East Fork Hood River there are no major diversions. The Oregon Department of Fish and Wildlife has applied for two water rights for beneficial instream uses in the segment (depending on the time of year, the first right would vary between 110 and 175 cubic feet per second and the second between 75 and 127 cubic feet per second). The Forest Service also holds several small, unused water rights. Upstream of the designated segment, flow is diverted near the headwaters by the Mt. Hood Meadows Ski Area. The water right is for 0.22 cubic feet per second from an unnamed tributary of the East Fork Hood River.

Water Quality

In general, water quality in the designated segment of the East Fork Hood River is fair. The Oregon Department of Environmental Quality considers the river 303(d) listed for the following pollutants: iron,

copper, thallium, and biological criteria. There is a total maximum daily load (2018) for temperature. More information is available at: <http://www.oregon.gov/deq/wq/tmdls/Pages/midcolumbiahood.aspx>.

Even though anthropogenic sediment sources, such as the Mt. Hood Meadows Ski Area, State Highway 35, and a relative high road density, have likely affected water quality to some degree, the East Fork Hood River is not listed for sediment (and does not have a total maximum daily load for sediment). Water quality within the designated segment, however, could be improved through implementing erosion control measures to reduce the contribution of fines from road sanding operations (especially on Highway 35), decommissioning, and/or storm-proofing roads to reduce overall road densities and erosion, as well as, restoring floodplain function, and increasing channel sinuosity by minimizing the effects of river encroachments (e.g., highway, roads, and campgrounds).

The Forest Service has collected both short and long-term temperature monitoring data. Recent stream flow data has been collected by the Hood River Watershed Group, Oregon Department of Fish and Wildlife, and the Confederated Tribes of Warm Springs.

Outstandingly Remarkable Values

Recreation

Evaluation of Present Situation

This 13.5 mile segment of river receives year-round recreational use of varied types and experiences. Year-round recreation activities include camping, hiking and biking of trails that follow the river. Some climbing and fishing occurs throughout the year as well as kayaking when river conditions are right. Hunting is a popular activity and occurs throughout the corridor. Winter activities include snowshoeing and Nordic skiing. Recreational use is low in many areas along the corridor due to the limited parking; however, use is high in isolated locations. Steep terrain within the corridor makes parking difficult.

Two developed campgrounds, Sherwood and Nottingham, are very popular throughout the spring, summer, and early fall as they provide an opportunity to camp along the river. There are also several dispersed campsites along the river that are very popular during the summer. There is heavy non-motorized use along the trails that follow and cross the East Fork Hood River including East Fork Trail #650, which follows the river, and Tamanawas Falls Trail #650A, which crosses the river. Other popular trails within the river corridor include Zigzag Trail #678 and Dog River Trail #675. Trailheads for these trails are developed, but limited in size. Gumjuwac Trail #480 is another popular trail that enters the river corridor, but access is limited by the trailhead capacity of one or two vehicles.

Nordic skiing and snowshoeing is popular during winter months. The best groomed Nordic ski trail system on Mt. Hood National Forest is present in the river corridor. There are regional Nordic skiing competitive events and races on the groomed trails. The ungroomed Nordic system receives moderate use and is dependent on snow levels. One of the few rock climbing areas on the Mt. Hood exists within the corridor. Routes varying from easy to extremely difficult are present in the columnar basalt cliffs. Access to climbing is dispersed in nature and not established or officially recognized.

Recreational opportunities along the East Fork Hood River are popular where established and accessible. They provide for unique experiences and vary immensely across the corridor.

Finding

One of the very reasons the East Fork Hood River was designated is for the “...low impact recreation opportunities abound.” This corridor can accommodate many types of recreation and offers a unique experience for kayakers due to its sustained gradient and continuous boulder features, unlike the more common bedrock formations (see Figure 7). These traits make this corridor unique when compared to other rivers in the region. For these reasons, recreation is found to be an outstandingly remarkable value for the East Fork Hood River.



Figure 7. A “low-flow” trip in early spring with Northwest Rafting Company, an Outfitter located in Hood River, Oregon. (Photo received from American Whitewater.)

Scenery

Evaluation of Present Situation

East Fork Hood River flows through and along the edge of a complex series of glacially and fluvial derived deposits before entering into a narrower steep-sided canyon containing a number of cliffs. Vegetative pattern along the segment is relatively common in nature for the region. Significant mortality from glacial events of existing timbered stands is relatively evident from Highway 35. There are some rapids in the lower portion of the corridor while elsewhere the stream gradient is relatively low with few substantial water related features.

There are places where long distance views of Mt. Hood, Bluegrass Ridge, and Elk Mountain can be seen as well as the steep cliff faces in the lower portion adding to the scenic quality of the corridor. There is some timber harvest in the upper portion of the corridor. Highway 35 is a Scenic Byway providing some exceptional views of Mt. Hood within the river corridor, but the river itself does not contribute significantly to these mountain views. Other scenic features include a variety of both east side and west side plant communities depending on one’s location along Highway 35, although the larger plant communities are not river dependent either.

The river corridor follows Highway 35, which has significant man-made features along the way to manage for rock fall and traffic. Numerous man-made features and modifications are noticeable within the watershed, such as the road itself, rip rap and guard rails. Due to the volatility of the streams in the area, the road itself has been repaired numerous times. Activity related to these repairs is visible within the corridor.

Finding

The area is not found to have highly memorable scenic features. While the area is very accessible to the public due to the highway, photographs are not seen in publications or used to convey any scenic uniqueness. The human alterations along the river are evident, and do not contribute to the scenic resources. While Highway 35 is a Scenic Byway, the river is not a significant contributor to this designation, compared to the vistas of Mt. Hood.

While East Fork Hood River provides interesting glacially influence features, the man-made influences, and common views does not provide outstanding scenery. The scenic resources were not found to be rare, unique, or exemplary for the area of comparison.

Geology/Hydrology

Evaluation of Present Situation

The large stratovolcano cone of Mount Hood dominates the watershed. The cone was constructed of relatively recent lava flows and pyroclastic flow deposits on an eroded platform of older volcanic rocks. Mount Hood has undergone considerable glacial erosion. The glaciers that remain high on its flanks are mere remnants of what they once were. Beyond the base of the volcano, the older volcanic rocks form lower elevation ridges and drainages. The upper Hood River valley is another major feature of this watershed. The valley lies within the Hood River graben, a normal fault with over 600 feet of offset that developed because of the emplacement of the High Cascade Range. Pyroclastic-flow and debris flow deposits from Mount Hood underlie the valley floor.

Finding

In a relatively short distance, the river flows through a variety of geologic formations and features, which include a glacial moraine with two waterfalls, glacial outwash, and a narrow canyon with alluvial and glacial deposits on one side of the river and steep canyon walls, with numerous cliffs, on the other side. The river starts in an area of glaciated pyroclastic debris, flowing through a glacial moraine from the Frasier glaciation period. This moraine contains, and is responsible for, the formation of two notable waterfalls, Umbrella and Sahalie Falls. The river then flows adjacent to, over glacial outwash material, and through a narrow canyon with walls consisting of alluvial and glacial deposits on the west side of the river and primarily andesite on the east side of the river. The canyon floor consists of clastic debris and alluvium. There is a recent debris flow entering the river at Pollalie Creek, which extends off the forest for a distance of about 12 miles. Because these features are not unique within the region of comparison, geology does not represent an outstandingly remarkable value.

Fisheries

Evaluation of Present Situation

Three federal or state-listed species are present in the East Fork Hood River: winter steelhead, coastal cutthroat trout, and likely Pacific lamprey. Designated critical habitat for steelhead trout is contained in this segment. Coho salmon and spring Chinook ascend the East Fork Hood River at least as far as Dog

River, but this area is just downstream of the wild and scenic river segment. The native Hood River spring Chinook run is extinct, but the population was reintroduced in the mid-1990s from Deschutes River stock and supplementation continues to the present. Other native species include rainbow trout and sculpin species. Steelhead and spring Chinook populations in the Hood River are supported by hatchery supplementation, and a large proportion of the coho spawners are made up of hatchery strays from other river systems (Reagan 2011).

There are two distinct habitat types in this segment. The upper segment lies in a broad glaciated valley with streambanks composed of un-vegetated and unconsolidated alluvial material. The channel is multi-threaded in many places with oxbows and off-channel habitats typical of broad floodplains. Fish habitat quality relative to pools, off-channel habitat, large wood levels, and channel meander processes is excellent. However, the natural instability of the glacial deposits mean that sediment levels are naturally very high and food production is limited. The lower segment of the river is mostly contained in a large, confined V-shaped. This section is mostly a swift, steep canyon that is principally used as a migration corridor for salmon and steelhead rather than for rearing and spawning.

The topography has resulted in a major highway and other roads to be located adjacent to the East Fork Hood River, which has reduced habitat complexity and side channel formation within several stream reaches. This has, and continues to, affect the quantity and quality of rearing habitat for steelhead and salmon. However, restoration projects focusing on large wood addition has improved some complexity. Removal of Powerdale Dam eliminated the last, and largest, significant barrier to up and downstream passage in the Hood River Basin. Water temperature within the designated segment is well within the suitable range for salmon and steelhead, and salmon spawning and rearing. Growth and survival characteristics appear to be stable for steelhead and successful spawning occurs in the mainstem and tributaries. For the re-introduced spring Chinook, there appears to be an expansion of use in to the East Fork Hood River.

Finding

The resident fish assemblage and hatchery supported anadromous fish stocks in the East Fork Hood River wild and scenic river segment is commonly found within other watersheds in the region of comparison. Fish population and assemblage within this segment is not considered an outstandingly remarkable value. Due to the combination of naturally occurring glacial fines and road impingements along much of this segment, the fish habitat is generally average in quality as relative to other rivers in the forest, as well as the region of comparison. Therefore, fisheries does not represent an outstandingly remarkable value.

Wildlife

Evaluation of Present Situation

The East Fork Hood River corridor contains high quality riparian habitat that provides for harlequin duck (Forest Service sensitive species) nesting, brooding, and rearing. Also, it is a critical seasonal travel corridor for deer and elk populations on the east side of Mt. Hood.

The population of harlequin ducks within this corridor is higher than on other portions of the Mt. Hood National Forest. The reasons for this are unknown, but possibly due to an abundance of aquatic invertebrates prey species, the proximity of the area to the Columbia River, or access from wintering waters of the Pacific Ocean. This species lives most of its life on the ocean coast, only migrating into freshwater streams during the nesting season. The East Fork Hood River is situated on the easternmost edge of this species range within the Pacific Northwest region.

The upper corridor provides critical elk calving and deer fawning habitat. The corridor is seasonally important to maintain populations of deer and elk as it provides a critical travel corridor from wintering grounds to calving and fawning habitat. There is a diverse range of wildlife species that would be found in the corridor since the riparian habitat links to Stringer Meadow within and adjacent to the corridor. Within the lower portion of the segment, important habitat for most wildlife species is very limited due to the steepness of the slopes within the canyon. Past timber harvest units do provide good habitat diversity for deer and elk.

One federally threatened species is found in the corridor, the northern spotted owl. The mid-elevations of the corridor consist of suitable nesting habitat for the northern spotted owl and spotted owl critical habitat. There are portions of two historic northern spotted owl home ranges and two one-hundred acre late successional reserves (Northwest Forest Plan land use allocation) within the corridor. Past timber harvest has fragmented suitable habitat in the remainder of the corridor for spotted owl.

Finding

The East Fork Hood River corridor provides for high quality critical travel/migration corridor for deer and elk between winter and calving season. This corridor also has one of the highest population of harlequin duck (a Forest Service sensitive species) and is situated on the easternmost edge of this species' range in the Pacific Northwest region. The river corridor provides for a contiguous migration corridor for harlequins to travel from their ocean wintering areas to summer nesting habitat. These critical habitat components provided by the East Fork Hood River corridor is an outstandingly remarkable value at the forest and regional scale.

Historic

Evaluation of Present Situation

This river segment is multicomponent with both prehistoric and historic sites scattered throughout the corridor. The Mt. Hood National Forest is a meeting place for the Columbia Plateau, Northwest Coast, and Great Basin culture areas. Although characteristics of all three cultural areas are likely visible in the East Fork of Hood River, the subbasin probably fits best with the Columbia Plateau culture area. Prehistoric sites in the subbasin reflect the various aspects and types of culture use and likely include seasonal camps, lithic scatters, large dart points, small and delicate arrow points, peeled cedar trees, and berry hearths.

Transportation, settlement, irrigation, logging and trapping sites are found throughout the Hood River Valley in which settlement by Euro-Americans began in the 1850s. Euro-American sites include those related to themes such as government (administrative sites and lookouts), transportation (roads, trails, and a railroad), communication (telephone lines), settlement (cabins and small farms), waterworks (ditches and dams), the Civilian Conservation Corps, hunting (pine marten sets), logging (sawmills and flumes), and mining. Transportation, settlement, irrigation, logging and trapping sites are found throughout the Hood River Valley in which settlement by Euro-Americans began in the 1850s.

Finding

This segment did not meet the criteria for an outstandingly remarkable value for the historic resources because the resources are not rare, unique, or exemplary within the region of comparison.

Prehistoric

Evaluation of Present Situation

American Indian prehistoric sites include seasonal camps, lithic scatters, rock features, peeled cedar trees, and isolated tools. Current prehistoric use includes the use of the East Fork as a fishery for Pacific lamprey, including investments made by the Confederated Tribes of Warm Springs for the fishery.

Finding

There is confidential prehistoric information that cannot be disclosed that is relevant to evaluating rivers for this value. No sites within this river corridor have rare or unique characteristics within the region of comparison. As such, prehistoric is not an outstandingly remarkable value.

Botany (Other Value)

Evaluation of Present Situation

In the upper corridor of the East Fork Hood River, the river and its immediate environment provides important riparian habitat in quantities greater than that usually found along other rivers throughout the region. This habitat is generally high in quality though some past management practices has lowered quality in specific locations. Important riparian habitat is very limited in the lower corridor due to canyon narrowness and the presence of State Highway 35 and associated structures. This area is often heavily impacted by debris flow in the upper corridor from Pollalie, Newton and Clark Creeks. These flows have in the past removed or smothered riparian vegetation, providing an opportunity to observe early successional stages of riparian habitat. Throughout the river corridor there are numerous wetlands, streams, and side channels that support diverse plant communities, some within late-seral forest habitat suitable for a variety of Region 6 sensitive or special status species.

In the lower-mid river corridor the moist basalt rock outcrops provide high quality habitat for the violet suksdorfia (*Suksdorfia violacea*). The violet suksdorfia is a Region 6 Sensitive Plant and is also listed by the Oregon Biodiversity Information Center. The Oregon Biodiversity Information Center ranking of this species suggests that is threatened with extirpation in Oregon (List 2), and may be critically imperiled due to extreme rarity (S1). Violet suksdorfia is known to occur on the Mt. Hood National Forest and the Columbia River Gorge National Scenic Area within the region of comparison.

Violet suksdorfia can mostly be found in shady, damp to wet mossy areas on steep, rocky slopes, rock crevices, cliffs, and riparian areas of east-side Ponderosa Pine-Douglas Fir stands. It has also been found growing in creek-side sand in some areas. The rock composition observed at known sites was basalt, granite, and limestone. The elevation range of this species is from 75 to 1300 meters.

There is conservation concern for the violet suksdorfia because of its limited range and global rarity. The known sites are small and disjunct, and the tolerance for disturbance by this species is not completely known. Suitable habitat is present throughout the East Fork Hood River corridor and is extremely important for the dispersal and viability of the species, particularly in Oregon where there are few known sites.

Finding

Botany is an outstanding remarkable value of the East Fork Hood River corridor due to the rare and uncommon violet suksdorfia that occupy the corridor.

Fifteenmile Creek

Findings Summary: Wildlife is an outstandingly remarkable value for all four segments of Fifteenmile Creek. The wild and scenic river corridor provides a wide diversity of wildlife habitat types; much of this diversity is rare within the region of comparison. Its diversity is due to the elevation changes within the corridor and creek itself. Recreation is an outstandingly remarkable value for segments 2 and 3. These segments overlap with the Fifteenmile National Recreation Area, which was designated to provide protection, preservation, and enhancement of recreational, ecological, scenic, cultural, watershed, and fish and wildlife values, and is popular with mountain bikers. Historical resources are another outstandingly remarkable value for segment 3. This segment includes important travel routes that owe their location to the creek. Lastly, fisheries is an outstandingly remarkable value for segments 3 and 4. The headwaters are some of the best habitat within the subwatershed, providing habitat for the mid-Columbia steelhead, one of the few remaining wild runs with little hatchery introgression.



Figure 8. Fifteenmile Creek, Segment 1

River Description

Fifteenmile Creek originates at Senecal Spring on Lookout Mountain in Oregon's Cascade Range (see Map 5). At 6,525 feet in elevation, Lookout Mountain is the highest point in the Badger Creek Wilderness. Fifteenmile Creek flows toward the northeast eventually joining the Columbia River just

below The Dalles Dam. Fifteenmile Creek is located within the Headwaters Fifteenmile subwatershed (12th-field HUC 170701050301).

Fifteenmile Creek segment 1 flows entirely through the Badger Creek Wilderness, starting at Senecal springs, which is a series of large springs with unconfined braided stream channels in a sub-alpine forest type. The braided channels soon come together as one confined channel flowing in a high gradient stream through a dense mixed conifer forest prior to ending at Badger Creek Wilderness boundary at Forest Service Road 2730 crossing. In segment 1, the elevation descends about 1,621 feet.

Fifteenmile Creek segment 2 flows downriver from the Badger Creek Wilderness boundary at Forest Service Road 2730 crossing and Fifteenmile Creek Campground to about 0.2 river miles downriver of Fret Creek confluence with Fifteenmile Creek. Flow from Fret Creek supplies about 30 percent of Fifteenmile Creeks total water flow. Fifteenmile Creek Trail #456 parallels Fifteenmile Creek for its entirety of segment 2 and Fret Creek Trail #456A crosses Fifteenmile Creek once before intersecting with Fifteenmile Creek Trail. Fifteenmile Creek is highly confined in a high gradient stream channel, which flows through a mixed conifer forest type.

Fifteenmile Creek segment 3 starts 0.4 river miles downriver from Bader Creek Wilderness boundary and ends at Forest Service Road 4421 crossing. Fifteenmile Creek Trail parallels Fifteenmile Creek for about 5.7 of its 7.9 river miles. The eastern trailhead of Fifteenmile Creek Trail is located at the eastern end of segment 3. Cedar Creek Trail #457 splits off Fifteenmile Creek Trail for about 4 miles before intersecting with it again, all the while crossing Fifteenmile Creek twice. Multiple waterfalls are present in segment 3 with the highest estimated at 51 feet high. Downriver of these falls, summer steelhead and resident redband trout can be observed. About 0.5 river mile below the waterfalls Fifteenmile Creek meanders through a moderate width floodplain located in a box canyon with the vegetation transitioning from mixed conifer to pine/oak habitat. Flow from Cedar Creek supplies about 30 percent of Fifteenmile Creeks total water flow. In segment 3 the elevation descends about 2,138 feet.

Fifteenmile Creek segment 4 starts at Forest Service Road 4421 and ends at the forest boundary. Both summer steelhead and resident redband trout are present in this segment; large adult steelhead trout can be seen in the late spring swimming in one of the numerous log jam pools. The elevation descends about 41 feet within this segment.

Discussion of River Values

Free-flow Condition

There are no U.S. Geological Survey gage stations on Fifteenmile Creek, but there are four gage stations operated by Oregon Water Resources Department. None of them, however, are located within the designated segments (all are downstream). Peakflows are snowmelt driven while baseflows are supported by a series of springs near the headwaters. High flows are generally expected during spring and early summer months while low flows occur during late summer and early fall. Both peakflows and baseflows are altered from the range of natural variability due to timber harvest openings and high road density.

The Fifteenmile Creek channel is relatively steep and confined with waterfalls in the headwater reaches. Within the two wild segments of Fifteenmile Creek (segments 1 and 3), the creek is completely free flowing in nature with negligible anthropogenic influences (e.g., dikes, riparian roads, stream crossings, dams, etc.) apparent in the channel. Within the two scenic segments of Fifteenmile Creek (segments 2 and 4), the free-flowing nature of the creek is impacted by road crossings, a footbridge, and several diversion structures (1 within segment 2; 6 within segment 4). The diversions not only remove a substantial amount of water from the stream but are also at least partial fish barriers.

In segment 1, there are five water rights, all conveyed by the Orchard Ridge Ditch. Altogether, 11 cubic feet per second are permitted within this designated Scenic segment. In segment 4, all four water rights have been cancelled and the Springer Ditch is no longer in use. An instream beneficial uses water right was awarded to Oregon Department of Fish and Wildlife in 1990 for varying amounts within the reach immediately downstream of segment 4 (outside of the designated wild and scenic river boundary). Depending on the time of year, the right varies between 4 and 20 cubic feet per second. Within segment 3, another beneficial instream flow water right (between 10 and 26 cubic feet per second) is currently being considered by the Oregon Water Resources Department.

Flows within the designated river segments could be made more natural by minimizing the connectivity of the road system drainage features with the stream network, as well as enhancing vegetative cover of upland slopes.

Water Quality

Some water quality monitoring has occurred within the designated segments. The Forest Service has collected stream temperature data within segment 2 and at the boundary between segments 3 and 4 (at the Wilderness boundary and the forest boundary, respectively). Wasco County Soil and Water Conservation District and Oregon Department of Fish and Wildlife have also collected data on Fifteenmile Creek. Sediment monitoring (percent fines data) were collected by the Forest Service within segment 3 and off-Forest in 2000. Oregon Department of Environmental Quality and Oregon Department of Agriculture have both collected pebble counts and bed stability data throughout the watershed, several times, most recently in 2015 and 2016. In addition, the Oregon Department of Environmental Quality has collected stream temperature data downstream from all segments.

Overall, water quality within the designated segments of Fifteenmile Creek is fair; all segments are on the 303(d) list for sedimentation. There is also a total maximum daily load for temperature (2008) for the Middle Columbia-Hood (Miles Creek) Subbasin. The Forest Service has started a draft Water Quality Restoration Plan for temperature, but it has not yet been finalized.

Threats to water quality in the listed segments of Fifteenmile Creek are predominately from previous forest management and roads. Recommended actions for improving water quality include riparian planting and/or fencing on key stream reaches where shade is insufficient, leasing instream water rights, creating off-channel water storage, enhancing spring protections, reducing fuels through forest thinning, as well as improving recreation management and road drainage and density.

Outstandingly Remarkable Values

Recreation

Evaluation of Present Situation

There is a great diversity of recreation uses within the Fifteenmile Creek corridor. A majority of the use occurs in the summer and includes camping, hiking, mountain biking, climbing, horseback riding, mushrooming, hunting, berry picking, and paddling. There are opportunities for Nordic skiing and snowmobiling in the winter. Access for some of these activities can be difficult during the shoulder seasons of spring and fall due to the elevation of the corridor and generally limited vehicle access. Overall, use levels are relatively low, except at main entry points where it can see moderate use. Higher use is focused around key access points, such as trailheads and campgrounds, as well as roadways. There is less use farther away from these access points.

The Fifteenmile National Recreation Area overlaps with segments 2 and 3 of this corridor. Only one campground exists in the corridor and the lack of development is part of the draw to this area. Fifteenmile

Campground and Fifteenmile Trail #456 are popular for hiking and mountain biking due to their proximity to the river. The campground sits along the banks of the river and the trail follows the river for the majority of its extent. The river can be seen and heard while hiking or biking the trail.

Fifteenmile Creek provides an opportunity to enjoy a quieter recreation experience than can be found along many river corridors on the Mt. Hood National Forest. The setting along the river corridor is generally more primitive than many areas; however, the river itself does not stand out as unique to other rivers in the region of comparison. Visitors to the area are mainly local, although some may come from within the region to hike or ride the trail.

Finding Segments 1 and 4

The designated Fifteenmile Creek has limited access and lacks a large recreational infrastructure that could draw visitors from outside the area. The recreation opportunities offered along segments 1 and 4 are not rare or unique, and do not have the potential to attract visitors from outside the region of comparison. Therefore, recreation is not found to be an outstandingly remarkable value for segments 1 and 4 of this river. All segments of Fifteenmile creek were found to have recreation listed as an outstandingly remarkable value in 2010, however, in the most recent evaluation both segments 1 and 4 did not meet the evaluation criteria defined.

Finding Segments 2 and 3

The Fifteenmile National Recreation Area was designated to provide for the protection, preservation, and enhancement of various values in the area, including recreation. The area is quiet, primitive, low road infrastructure, beautiful, and offers the opportunity for a primitive, yet unique experience for visitors. Segments 2 and 3 overlap with the National Recreation Area designation and recreation along these two segments was found to be an outstandingly remarkable value.

Scenery

Evaluation of Present Situation

Fifteenmile starts in the Badger Creek Wilderness, and include four segments of designation from the headwaters to just beyond the forest boundary; these designations alternate wild and scenic, starting with wild in the wilderness, and ending with scenic at the edge of the forest boundary. Fifteenmile Creek flows through and along the edge of a complex series of glacially- and fluvially-derived deposits before entering into a narrower steep-sided canyon containing a number of cliffs. The topography of the area is one reason this river was designated with a half mile interim corridor, rather than the standard quarter mile. Debris flow features are visible along Fifteenmile Creek #456 trail, which follows the river. The area falls in a transition zone between the High Cascades and the Columbia Plateau with a diversity of vegetative types, including oak ponderosa pine woodlands, a relatively rare habitat type confined to the vicinity of the eastern slope of the Columbia Gorge. There are small rapids and falls in some locations, but for the most part the gradient is low.

Visitors experience a variety of scenery along the river, from an alpine fir forest along the upper segment to a ponderosa pine and Oregon white oak forest while moving east along the trail. Prominent exposures of columnar basalt along the Fifteenmile corridor add to its scenic natural qualities. There are places where long distance views of Eastern Oregon Blue Mountains, Columbia River Corridor, and Deschutes River Corridor can be seen adding to the scenic quality of the corridor. White oak and larch can be found throughout the corridor adding to color and contrast between seasons. The vegetative transition zone provides a variety of contrasts in texture and color due to the differing vegetative types found within the river corridor. Modifications are limited throughout the corridor. The few roadways close to the corridor

are relatively primitive dirt roads. Trails are also more primitive than developed. Sounds and sites of roads are limited to specific locations within the viewshed. The area was not seen as having highly memorable views compared to similar areas, and research did not find the area drew the attention to be highlighted in publications.

Finding All Segments

All four segments of Fifteenmile Creek were evaluated individually, and the findings were the same for all segments. While Fifteenmile Creek has a diversity of vegetation because the location in a transition zone from Cascades to Columbia Plateau, the views are not, highly memorable, and sites were not necessarily seen in publications. The views are relatively common within the region of comparison, and do not provide outstanding scenery. The scenic resources were not found to be rare, unique, or exemplary for the area. Thus, scenery is not an outstandingly remarkable value for this river.

Geology/Hydrology

Evaluation of Present Situation

Fifteenmile Creek has carved its valley into an older, generally flat erosion surface that slopes gently to the east. The result is a series of steep-walled canyons separated by flat-topped ridges, all oriented in an east-west direction. The western headwater areas of the larger drainages are gently to moderately sloped uplands, with the exception of the steep, northeast facing slopes of Lookout Mountain. This area on Lookout Mountain is the only part of the watershed to have been recently glaciated.

This watershed has some of the most stable land within the forest. However, some isolated areas contain weak enough material and steep enough slopes to have a moderate to high potential for mass wasting. The lack of much recent evidence for landsliding is due to the low precipitation. The landform has the appearance of being developed in the geologic past through landslide processes, especially south facing slopes (gullying that undercuts tributary stream banks, resulting in debris slides and debris flows). An unusual, very intense storm would be expected to produce some small landslides that deliver sediment to channels.

Finding All Segments

The above features may not be found along all rivers throughout the region, but they are still considered relatively common. Although the reach is relatively easily accessible, the opportunities to view “textbook” geologic examples do not readily present themselves. Because these features are not unique within the region of comparison, geology does not represent an outstandingly remarkable value.

Fisheries

Evaluation of Present Situation

Fish population

Fifteenmile segments 3 and 4 sustains multiple fish species listed as federal or state-listed species, including steelhead, redband trout, and highly likely Pacific lamprey. As of fall 2017, all known year round human created barriers to fish passage has now been removed up to the middle designated segment 4 in Fifteenmile Creek. There are no known fish in segments 1 and 2 of Fifteenmile Creek. Multiple impassable waterfalls (10 to 51 foot height) are present in these segments (USDA Forest Service 2017).

Steelhead in the Fifteenmile Creek basin are federally threatened and considered unique because they are one of the few remaining wild runs with little hatchery introgression. There has never been a hatchery

stocking program for steelhead in the Fifteenmile Creek basin. The steelhead in this subbasin are the easternmost run of wild winter steelhead in the Columbia Basin. The Middle Columbia Technical Recovery Team charged with developing technical guidance and analysis to aid in recovery planning efforts (French, personal communication 2007) recognizes the winter steelhead population in Fifteenmile Creek as both a “core” and “genetic legacy” population. A core population is defined as one that either represented substantial portions of the Evolutionarily Significant Unit/Distinct Population Segment historical abundance or contained life-history strategies specific to the Evolutionarily Significant Unit/Distinct Population Segment. Core populations are considered important for maintaining the evolutionary legacy of the Evolutionarily Significant Unit/Distinct Population Segment, and managers are encouraged to give priority to these populations in recovery planning. A genetic legacy population is defined as one that either had minimal influence from non-endemic fish through artificial propagation practices or exhibits important life-history traits no longer found throughout the majority of the Evolutionarily Significant Unit’s/Distinct Population Segment’s historical range. Managers are encouraged to give recovery planning priority to genetic legacy populations since they retain the most intact representatives of the genetic composition of the Evolutionarily Significant Unit/Distinct Population Segment. Oregon Department of Fish and Wildlife has closed fishing for steelhead in the Fifteenmile Subbasin since 1979 to protect this unique stock.



Figure 9. Fifteenmile Creek, Segment 3

There has been considerable discussion on whether or not redband trout are present in the Fifteenmile Creek basin. Most recently, Blankenship et al. (2011) grouped the Fifteenmile Creek samples as having more of a redband trout genetic lineage and metapopulation with other known redband trout populations in the Columbia River basin. Schreck et al. (1986) grouped steelhead that are found in Fifteenmile Creek

with the redband, but Behnke (1992) states, “these fish resemble coastal rainbow trout in their full suite of taxonomic characters more than they do other redband steelhead from east of the Cascades.” Currens (1987) conducted a genetic study on differences between resident and anadromous rainbow trout in the Deschutes River basin. Currens found evidence that the trout in the White River basin (the southern boarding basin to Fifteenmile Creek basin) above White River Falls may be remnants of an ancestral redband trout population, which are morphologically more similar to redband trout from the Oregon desert basins. Unlike White River above the White River Falls, Fifteenmile Creek trout are not isolated from outside genetic flow, potentially from steelhead. Since the study from Blankenship et al. (2011) has been conducted on a Columbia River basin-wide systematic sampling framework, which Fifteenmile Creek Watershed was included, fisheries professionals are referring to the resident trout in Fifteenmile Creek as Columbia River interior redband trout.

Pacific lamprey distribution is relatively unknown in Fifteenmile Creek, but larval lamprey and redds have been found above the Dufur City intake. The historic range of Pacific lamprey has shown to coincide with other anadromous species, including within the Fifteenmile segments 3 and 4.

Fish habitat

There are no known fish in segments 1 and 2 of Fifteenmile Creek, but this reach does provide high quality and quantity, cold, clean water downstream to designated segments 3 and 4 of Fifteenmile Creek. Multiple federal or state-listed threatened and sensitive fish species and their habitat (both adult spawning and juvenile rearing habitat) are present in the segments of 3 and 4 of Fifteenmile Creek. Both segments 3 and 4 of Fifteenmile Creek are considered of high importance to move the wild steelhead population toward recovery as described in the Mt. Hood National Forest 2010 Fifteenmile Creek Basin Aquatic Habitat Restoration Strategy. As well as the Fifteenmile Creek Watershed population as part of the Cascades Eastern Slope Tributaries Major Population Group, as described in the 2008 Oregon Department of Fish and Wildlife Recovery Plan for Oregon Steelhead Populations in the Middle Columbia River Steelhead Distinct Population Segment (Oregon Department of Fish and Wildlife 2010).

Designated segments 1 and 2 of Fifteenmile Creek provide high quality and quantity, cold, clean, water downstream to designated segments 3 and 4 of Fifteenmile Creek. Fifteenmile Creek provides national and regional opportunities for scientific study and interpretation for the interaction between wild stocks of inland redband trout and anadromous steelhead.

Finding Segment 1 and 2

As there are no known fish in segments 1 and 2 of Fifteenmile Creek, therefore, there is no potential for fish as an outstandingly remarkable value.

Finding Segment 3 and 4

Fifteenmile segments 3 and 4 sustain multiple fish species listed as federal or state-listed threatened or sensitive species, including steelhead, redband trout, and highly likely Pacific lamprey. As of fall 2017, all known year-round human created barriers to fish passage has now been removed up to the middle of segment 4. Fifteenmile Creek steelhead are especially unique because they are one of the few remaining wild runs with little hatchery introgression. There has never been a hatchery stocking program for steelhead in the Fifteenmile Creek basin. The winter steelhead population in Fifteenmile Creek is recognized as both a core and genetic legacy population for the Middle Columbia Evolutionarily Significant Unit and are thus a regionally significant stock. As such, fisheries is an outstandingly remarkable value for these segments.

Wildlife

Evaluation of Present Situation

This corridor contains an exceptionally wide range of wildlife habitat, because it spans 11 miles east to west beginning in subalpine fir at Lookout Mt. (6,500 feet) and ending in pine/oak habitat at the forest boundary (2,400 feet). Species that specialize in these habitat types vary greatly, from American marten (a forest management indicator species) in the high elevations to gray squirrel (management indicator species) in the pine/oak. A large diversity of migratory birds are also supported along the corridor because of the varying habitat types. Some of these bird populations are significantly declining (blue grouse, olive-sided flycatcher, and brown creeper). Beaver colonies are present in the watershed, which create even more habitat diversity within the river corridor.

The eastern five miles of the river corridor provides moderate quality winter range for deer and elk as most of these animals spend winters off-forest. The western 2.5 miles provide high quality calving/fawning habitat, and the entire corridor serves as an important migration route for deer and elk. The south facing slopes along 4 miles of the eastern section provide habitat for pine/oak dependent species which is limited on the forest and declining range-wide due to conversion to agricultural or residential/urban expansion. The pine/oak portions of the corridor provide habitat for a number of Forest Service and/or state-listed sensitive species (Lewis' woodpecker, white-headed woodpecker, and western bumblebee) and forest management indicator species (deer, elk, wild turkey, and western gray squirrel).

Most of the river corridor, aside from the pine/oak, provides suitable habitat for northern spotted owl (federally threatened species), and is within the Surveyor's Ridge Late Successional Reserve (Northwest Forest Plan land use allocation). There are portions of seven northern spotted owl territories that fall within the corridor. Spotted owls are a federally threatened species and have continued to decline despite habitat protections put in place under the 1994 Northwest Forest Plan.

Finding All Segments

The diversity of habitat types and highly diverse range of species found in this corridor is quite unique. There are few areas on the forest or region of comparison that transition from subalpine-fir to pine/oak in only 11 miles. The Fifteenmile Creek corridor also provides a high quality critical habitat linkage for deer and elk wintering range to summer (calving/fawning) range. Wildlife is an outstandingly remarkable value for these segments because of the diversity of habitat and high quality big game travel corridor.

Historic⁴

Evaluation of Present Situation

European and Asian-American sites include those related to themes such as government (administrative sites and lookouts), transportation (roads, trails, and a railroad), communication (telephone lines), settlement (cabins and small farms), waterworks (ditches and dams), the Civilian Conservation Corps, hunting (pine marten sets), logging (sawmills and flumes), and mining.

The Dufur to Lookout Mountain Trail is within segment 1 of Fifteenmile Creek. This trail played a prominent role in the early history and settlement of Wasco County. The drainage was first documented as

⁴ A data error was discovered when preparing the comprehensive river management plan. Sites previously thought to be located in the Fifteenmile Creek wild and scenic river corridor are located outside the interim and proposed final boundaries. This section was updated in February 2021 to reflect the proper location of the historic sites within the corridor. The outstandingly remarkable value findings do not change, but the evaluation was updated.

Nansene Creek prior to the large immigration waves of the mid-nineteenth century, and archaeological evidence suggests the headwaters and travel corridor have been in use for more than 2,000 years. In 1852, the first permanent settlers, primarily stockmen, arrived in the Fifteenmile Creek drainage, homesteading near the current site of Dufur. By 1872, the Dufur brothers and others were grazing large herds of sheep and other livestock along this travel corridor and at High Prairie, near the Headwaters of Fifteenmile Creek. Several small sawmills operated along the upper extent of Fifteenmile Creek during this period to support the area's fledgling communities and homesteads, the trail and waterway essential to growth. In 1893, the upper extent of Fifteenmile Creek became part of the Cascade Range Reserve. Fire prevention was a priority, and an extensive and well-maintained trail system was considered vital to that effort. During this period the first fire lookout on the eastern side of the Forest was constructed on Lookout Mountain; the peak considered one of the best vantage points in Oregon. Sometime prior to 1901, the Dufur to Lookout Mountain trail was extended to the southwest, over Bennett Pass, to link with the Barlow Road near Summit Creek. This would become an important cutoff from the Barlow Road, linking the communities from east and west. Much of this work was spearheaded by J.B. Senecal, the first Ranger in the northeastern portion of the Reserve. Within a decade recreational use of the trail increased greatly. To the east, the trail provided a grand view of eastern Oregon and the Blue Mountains. The unobstructed view of Mt. Hood, several miles to the west, was considered the best on the Forest. Planning was under way for the Mount Hood Loop Highway during this period, and the Lookout Mountain Trail was a strong candidate for improvement as this scenic travel route. An alternate route prevailed, however, efforts to convert the trail to a road persisted. In 1933, Roy T. Johnson and a crew of sixty Civilian Conservation Corp men were charged with creation of the Bennett Pass Road. This road followed the trail alignment from High Prairie to the Barlow Road in the west, and Fifteenmile Campground in the east. The men camped at High Prairie, using the cabin built nearly three decades earlier by Senecal as a main office.

Historic sites in segments 2, 3, and 4 of the Fifteenmile Drainage relate to settlement and economic development along the eastern foothills of the Cascades during the latter half of the nineteenth century in Wasco County and early administration and fire protection of the area's initial federal forest reserve. Documented historic sites include homesteads, sawmills, sheep camps, irrigation and agriculture, relic trails and grades, lookouts and lookout trees, fire caches, and logging debris.

Finding Segment 1

The Dufur to Lookout Mountain trail was important in the early administration of the Forest and is strongly associated with J.B. Senecal, the area's first, and perhaps most important Ranger. The trail is associated with nearly every activity occurring in segment 1, including grazing, timber harvest, recreation, and Forest Service administration. Fifteenmile Creek played a prominent role in each. For these reasons, the Dufur to Lookout Mountain Trail is considered eligible for inclusion in, the National Register of Historic Places. This cultural resource meets the criteria of an outstandingly remarkable value for segment one of Fifteenmile Creek.

Finding Segment 2, 3, and 4

Historic sites in segments 2, 3, and 4 of the Fifteenmile Creek drainage relate to settlement and economic development along the eastern foothills of the Cascades during the latter half of the nineteenth century in Wasco County, and early administration and fire protection of the area's initial federal forest reserve. Documented historic sites include homesteads, sawmills, sheep camps, relic trails and grades, lookouts and lookout trees, fire caches, and logging debris. These historic sites do not meet the criteria for an outstandingly remarkable value for historic resources because they were found not to be rare, unique or exemplary within the region of comparison.

Prehistoric

Evaluation of Present Situation

American Indian sites include seasonal camps, lithic scatters, rock features, peeled cedar trees, and isolated tools. There is evidence of traditional use throughout the corridor with the identification of numerous eligible prehistoric sites. Fifteenmile Creek is listed as an “Expected High Density Resource Area” in the Mt. Hood Cultural Resource Reevaluation Report (1994). When conducting site research, numerous prehistoric sites were found in the area. Also, active lamprey harvesting occurs in Fifteenmile Creek by the Confederated Tribes of Warm Springs.

Finding for All Segements

There is confidential prehistoric information that cannot be disclosed that is relevant to evaluating rivers for this value. No sites within this river corridor have rare or unqiure characteristics within the region of comparison. As such, prehistoric is not an outstandingly remarkable value.

Fish Creek

Findings Summary: Fisheries is the outstandingly remarkable value for Fish Creek. Fish Creek supports diverse fisheries populations, including wild and native species, and threatened and sensitive species. Fisheries habitat within the wild and scenic corridor is moving towards exceptional habitat based on the large-scale road decommissioning that occurred following the 1996 flood events, effectively eliminating access to about 90 percent of the watershed. Very few other watersheds in the region has gone from such high levels of road access to almost none within a few decades.

River Description

Fish Creek is a tributary to the Clackamas River, generally oriented south to north, on the western slope of the Cascade Range in northwest Oregon (see Map 6). The lower terminus is at the mouth of Fish Creek where it empties into the Clackamas River. Elevation of the termini range between about 920 and 4,940 feet. This segment of Fish Creek is mostly a 4th and 5th-order perennial reach that originates from headwater springs, seeps, small lakes, and intermittent streams. This segment lies within the Fish Creek subwatershed (12th-field HUC 170900110403). The contributing watershed is ruggedly mountainous and highly dissected with a dendritic stream network comprised of many long steep named and unnamed tributaries.

The segment has a very confined channel, dominated by a low to moderate gradient in the lower reaches below Wash Creek, and moderate to steep gradient in the reaches above. Only the lower 1.5 miles of this segment is visible from Forest Service Road 54, where there are some dispersed campsites and a boat ramp. The remainder of this segment’s length is largely out of site and inaccessible by any roads or trails. The four-mile section ending at the Clackamas River is suited for whitewater paddling by experienced boaters.



Figure 10. Mouth of Fish Creek

Discussion of River Values

Free-flow Condition

A stream gage near the mouth of Fish Creek was in operation from 1989 to 2006. Generally, peak flows for this basin occur in the winter and early spring months in response to heavy precipitation, runoff, and snowmelt, while base flows typically occur during late summer and early fall.

This segment is considered to be free flowing as there are no human-made impoundments or diversions and the flow is unregulated. All existing water rights were transferred to in-stream beneficial uses in 1966. These rights, held by the Oregon Water Resources Department vary by time of year; permitted volumes vary from 3 to 60 cubic feet per second.

There are no longer any utilized road crossings over Fish Creek, but a short length of forest road parallels the creek at the downstream end of the designated segment. Nearly all of the roads in the watershed were decommissioned after the flood of 1996 due to irreparable damage, principally as a result of landslides. There are about five remnant bridges over the creek that were not removed during road decommissioning. Their condition and status are unknown, but its likely the abutments impinge on the floodplain. Naturally occurring barriers to navigation are present in the channel such as large and small log jams, recurring beaver dams, and small waterfalls in the upper reaches. There were also many large, in-stream wood structures emplaced in the later 1980s through the mid-1990s in an effort to restore and enhance fish habitat.

Water Quality

In general, water quality within this segment is fairly good, but data are limited. A single sample was collected in July of 1998 at the gage site. The sample did not reveal any contaminants of note. Additional data was collected and compiled for a study of water quality in the Clackamas basin in the early 2000s. It corroborated data that had been collected by the local Forest Service district and compiled for the Aquatic and Riparian Effectiveness Monitoring Program, indicating that the State's 7-day maximum stream temperature standard for fish had been exceeded a number of times during late summer months in the lower reaches of the segment. It is not listed, however, on the Oregon Department of Water Quality 303(d) list of impaired waters because a total maximum daily load for stream temperature was established (2006), and a Water Quality Restoration Plan has been developed by the Forest Service.

Sediment is not considered to be a pollutant in the segment. The terrain in the watershed, however, is inherently very disposed to mass wasting, and there are many debris flow-prone channels and earthflow features that are sources of naturally episodic large pulses of sediment. A post-flood aerial landslide inventory conducted in 1996 detected 236 landslides in the Fish Creek drainage, a large percentage of which were associated with weak geologic formations.

Additionally, timber harvest and road construction in past decades was extensive; there is a high likelihood that additional sediment has been contributed over time. About 62 percent of the landslides inventoried after the 1996 flood were associated with young plantations and roads, with 80 percent of the total count delivering debris and sediment to a stream. In response, the Forest Service decommissioned about 75 percent of the road system, effectively eradicating access to about 90 percent of the watershed.

Outstandingly Remarkable Values

Recreation

Evaluation of Present Situation

From its headwaters to the confluence with the Clackamas River, Fish Creek is a 13.5-mile stretch of designated Wild and Scenic River. Given the river's proximity to Portland, including low elevations and short drive times, this is a year round desirable location for recreationists.

Dispersed camping is one of the more common recreation activities along and near Fish Creek, especially on any flat terrain near the river. One study revealed 22 dispersed campsites along Fish Creek mainstem back in 1993 during the watershed analysis, but all have since been removed to protect and enhance water quality and riparian vegetation. Other recreational activities include whitewater kayaking, hiking, hunting, and fishing. Following the floods of 1996, the Forest Service decommissioned many roads in the watershed limiting access to many parts of the river.

Areas of Fish Creek that are easily accessible by vehicle provide limited access to a class III to IV rapid, often free of woody debris. Paddlers drive up to the end of pavement and hike in. Fish Creek has gained notoriety with its challenging river floating opportunities.

There is only one developed recreation facility in the Fish Creek watershed, the Fish Creek boat ramp, located at the confluence of Fish Creek and the Clackamas River. The parking area also serves as the trailhead for the Clackamas River Trail #715 and staging area for river events.

Fish Creek is very important as potential anadromous fish habitat for spring Chinook, winter and summer steelhead, and winter run coho salmon. A limited number of environmental education and interpretation

occurs along the mainstream of Fish Creek. School classes and biologists visit a number of sites to view fish structures and monitoring sites. Three bulletin boards placed along the creek provide messages about fish and their habitat.

Finding

While subsets of local groups utilize Fish Creek for some recreational activities, it is not widely known or sought after by the local or regional user groups as defined in the evaluation criteria. Therefore, recreation is not found to be an outstandingly remarkable value for Fish Creek.

Scenery

Evaluation of Present Situation

Many cliffs in the corridor add visual diversity. These are not found in all rivers, but are found in other locations throughout the region of comparison. Views and photo attractions are considered low, and human altercations cause some reduction in the visual quality, especially in the upper portions of the drainage.

Vegetation management activities are visible within the corridor. The Fish Creek drainage has had most of the roads decommissioned and now the area is not as accessible by roadways. The floods of 1996 caused significant road damage, and through several planning efforts, roads were decommissioned in the drainage. At the lower section of the creek, Fish Creek campground provides recreation access.

Vegetation management activities have occurred within the corridor along the length of the canyon, which is visible from the creek and nearby roads. The area immediately adjacent to the creek is protected, for scenic viewing and streamside protection along the lower 3 miles of the creek.

Finding

Fish Creek provides common scenery to the local area, as well as within the region of comparison. The views are not highly memorable, nor are they found highlighted in publications. Therefore, scenic resources were not found to be rare, unique, or exemplary for the area.

Geology/Hydrology

Evaluation of Present Situation

Most of the watershed lies within the Western Cascade physiographic province, a thick sequence of interbedded lava flows, pyroclastic flows, and volcanic deposits. This drainage, however, was inundated by, and is thus underlain with, the 17 to 15 million year old Grand Ronde member of the Columbia River Basalt Group. During the most recent glacial advance, small mountain glaciers formed in the upper reaches of the drainage, and glacial deposits can be found in the headwaters. Additionally, there is evidence of ancient, deep-seated landslides that form large, bench-forming deposits. These landslides are thought to have been triggered by large magnitude earthquakes during a wetter climate.

Finding

The above features may not be found along all rivers throughout the region, but they are still considered relatively common. Opportunities to view “textbook” geologic examples do not readily present themselves. Because these features are not unique within the region of comparison, geology does not represent an outstandingly remarkable value.



Figure 11. Native Trout in Fish Creek

Fisheries

Evaluation of Present Situation

Fish populations

Fish Creek is a regionally important producer of wild threatened and sensitive anadromous fish species, especially winter-run steelhead. Research on smolt production after the 1996 flood, revealed that, on average, Fish Creek produced more steelhead juveniles and smolts than most other upper Clackamas tributaries, such as the North Fork and Oak Grove Fork (Hansen et. al. 2009). There is a diversity of wild fish stocks that includes anadromous salmonids (late-run coho, winter steelhead, and spring Chinook), coastal cutthroat trout, rainbow trout, mountain whitefish, longnose dace, and sculpins.

The Clackamas River late-run coho is considered the last viable wild coho stock in the Columbia River basin (Nehlsen et al. 1991). For reference, the 2015 population status review concluded that the vast majority (over 90 percent) of historical populations remaining in the Lower Columbia River coho salmon Evolutionarily Significant Unit appeared to be either extirpated or nearly so given the high proportion of hatchery spawners that dominated many of the coho populations, and that there was little natural productivity (Northwest Fisheries Science Center 2015). Native coho stocks that once ranged into the Snake River and mid-Columbia tributaries of the Columbia River Basin are now extinct above Bonneville Dam. Similarly, Clackamas River spring Chinook were rated as one of only two remaining natural runs in the Willamette basin with the least hatchery influence, and is thus a natural population stronghold. Review of winter steelhead stocks in the Lower Columbia River Evolutionarily Significant Unit noted

that for most populations, total abundances and natural-origin abundances (where available) have remained low, averaging in the hundreds of fish. Notable exceptions to this were the Clackamas and Sandy River winter-run steelhead populations that are exhibiting recent rises in abundance and maintaining low levels of hatchery-origin steelhead on the spawning grounds.

Although not yet documented in Fish Creek, suitable habitat is available for Pacific lamprey, a state-listed sensitive species. It is expected that this species will progressively re-colonize historic habitat of the upper Clackamas tributaries due to targeted lamprey passage improvement projects at downstream dams completed in the last decade. Bull trout, a federal threatened species range-wide, were likely historically present in Fish Creek (Shively et al., 2007). Similar to Pacific lamprey, recent changes in management (bull trout were reintroduced in 2011 to the upper Clackamas watershed) may allow bull trout use again in Fish Creek. Bull trout have been detected throughout the upper Clackamas River since the reintroduction began, and regularly migrate past the mouth of Fish Creek. Fish Creek is able to provide foraging, and possibly rearing, habitat for this species.

Fish Creek is a major tributary in the upper Clackamas River watershed. Since 1999, the Oregon Department of Fish and Wildlife has managed the upper Clackamas (upstream of Pacific Gas and Electric's North Fork Dam) as a wild fish sanctuary. At this time, all anadromous salmonids identified as hatchery origin (i.e., those that are adipose fin clipped), are captured at the North Fork Dam fish trap, and prevented from migrating past the dam into the upper river. To further support wild fish protection goals, this upper river reach has also been closed to all salmon and steelhead fishing since 1998. In 2010, the new federal license for the Clackamas River Hydroelectric Project has started to improve both upstream and downstream passage at mainstem Clackamas River facilities, increased minimum flow in the Oak Grove Fork (high quality tributary to the Clackamas River), as well as dedicated several million dollars to habitat restoration in the Clackamas watershed. These improvements will benefit the overall fish production and habitat quality in the watershed that will highly likely translate to increased fish utilization within Fish Creek.

Introduced brook trout (non-native) have been planted in two high lakes upstream of this segment. Non-native brook trout pose a future threat to native cutthroat, rainbow, and bull trout through predation, and competition for food and available habitat, if they expand their distribution. Brook trout could also hybridize with bull trout, which is an additional threat. At this point, it does not appear that brook trout is currently present in this segment of Fish Creek.

Fishing pressure is light, there is no anadromous fishery, and vehicle access is limited to the fringes of the watershed. However, the opportunity to fish in the high lakes probably keeps anglers interested in protecting Fish Creek as a fishing destination.

Fish Habitat

Currently, aquatic and riparian habitat in the Fish Creek is generally in good condition, except in few localized areas of disturbance due to recreational activity low in the watershed, and residual effects from past timber harvest. Among streams that would aid the recovery of federal and state listed-fish, Fish Creek is a key area for survival and recovery of winter steelhead in the Clackamas River Basin. The river provides high quality habitat for fish species indigenous to the region. Of particular significance is habitat for wild stocks considered unique, and populations of federally or state listed threatened or sensitive species.

Fish Creek is well known through the Pacific Northwest for the long-standing research program to evaluate the physical and biological response to a large-scale aquatic habitat restoration project

implemented during the mid to late 1980's. Over 500 logs and boulder structures were placed in-stream. A one-hundred year equivalent flood occurred in early February of 1996. Severe landslides and debris torrents were initiated by this major storm event resulted in significant channel changes and adjustments. Pre/post flood monitoring showed a significant increase in riffles and a reduction in pools habitat in Fish Creek post 1996 floods. A substantial number of in-stream log and boulder structures were washed out of the watershed. A tremendous decline in fish productivity was observed immediately post-flood. A stream survey in 2007 showed that habitat in Fish Creek does not meet standards for large wood and pools (USDA Forest Service 2007). The survey from (mid-July to mid-August) measured stream temperatures that ranged from 10 to 19 Celsius. Water temperature of over 17 degrees Celsius may be tolerated by salmonids, but is not ideal.

The habitat in Fish Creek has been slowly recovering since the 1996 floods, largely due to the Forest Service decision to decommission about 75 percent of the road system, including the removal of many impassable culverts. This management action effectively eliminated motorized access to about 90 percent of the watershed. Potential riparian and stream impacts from roads, timber harvest, and high recreation use has been very limited for several decades. With riparian habitat protection, canopy cover has improved and stream temperatures have nearly returned to their natural range. There are currently no plans to rebuild access to this segment and thus the stream habitat is on a trajectory to once again provide high quality fish habitat.

Finding

The fish population and habitat in Fish Creek are outstandingly remarkable because of the combination of wild fish species presence and diversity (late-run coho, winter steelhead, spring Chinook), management of this segment as a part of a larger wild fish sanctuary, and the potential for this future use by several other declining wild stocks (bull trout, Pacific lamprey) is unique regionally. This is especially so considering that 90 percent of motorized access has been eliminated in the last few decades, and the fish habitat will be allowed to function essentially undisturbed. Very few other watersheds in the region has gone from such high levels of road access to almost none within a few decades.

Wildlife

Evaluation of Present Situation

The Fish Creek segment contains quality riparian habitat, with large tracts of late-successional stands and meadows and pond complexes at its headwaters. These different habitat types contribute to the high wildlife species diversity in this area. Since the 1996 floods, the Forest Service has decommissioned about 75 percent of the road system. This management action effectively eliminated motorized access to about 90 percent of the watershed. Since there are currently no plans to rebuild access to this segment, the disturbance to wildlife species will be quite low.

One federal threatened species is found in these segments, the northern spotted owl. There is one northern spotted owl core nest areas as well as a portion of three additional northern spotted owl home range. The majority of the river segment is in northern spotted owl critical habitat and provides suitable or dispersal northern spotted owl habitat. One Forest Service sensitive species, the harlequin duck, was detected in this segment from surveys done in the 1990s.

Three other management species are known to inhabit this area, the pileated wood pecker (forest management indicator species), pine marten (forest management indicator species), and red tree vole (Northwest Forest Plan survey and manage species). Deer and elk populations are higher than many other areas of the forest, but is decreasing due to the reduction of available early seral habitat as little logging

has occurred for several decades. The headwaters area of this segment is quality deer and elk summer range and calving area, although most of this habitat is outside of the wild and scenic river corridor.

Finding

Although the Fish Creek corridor contains quality riparian habitat and some diversity of wildlife species, this diversity is commonly found on other rivers corridors elsewhere on the Mt. Hood National Forest, as well as other rivers within the region of comparison. Neither wildlife species nor habitat is found to be an outstandingly remarkable value on this river segment.

Historic

Evaluation of Present Situation

The greater Clackamas River drainage and its tributaries represent an important river systems in the northern Oregon Cascades. The resources supplied by this system and its surrounding mountains have sustained human populations in the region for up to 10,000 years. Historic sites reflect the economic importance of the river drainage to early immigrant populations. Early trails and bridges provided access to the area for early homesteaders, loggers and Forest Service personnel.

Finding

Based on the initial research, the historic resources are not unique within the region of comparison. There are many sites along this river corridor, but there is nothing that is extraordinary that you cannot find elsewhere, no eligible or listed sites, or any intact visible resources. As such, this segment did not meet the criteria for an outstandingly remarkable value for historic resources.

Prehistoric

Evaluation of Present Situation

There is a high density of prehistoric localities identified despite limited surface visibility. It is likely that high late-summer productivity of plant and animal resources near the river, the presence of salmon runs, and the nearby landforms made this corridor a particularly desirable place for human use throughout much of the prehistoric past. The relatively high density of archaeological remains near the river is an indication of its importance. The type of prehistoric localities (lithic scatters and peeled trees) reflects at least two of the primary economic pursuits practiced in the vicinity of the river—big game hunting and fiber collection for containers and clothing. It is probable that containers were used to transport huckleberries and other upland resources from their primary habitat further upslope to residential locations on the lower Clackamas and Cascade marginal valleys. Salmon fishing was likely to have been another important prehistoric activity.

Several sites in this segment are eligible for the National Register of Historic Places under Criterion D. Several sites provided data relevant to issues in chronology, settlement and subsistence, lithic technology, procurement and exchange. Site use dates from 4,000 to 10,000 years.

Finding

There is confidential prehistoric information that cannot be disclosed that is relevant to evaluating rivers for this value. No sites within this river corridor have rare or unique characteristics within the region of comparison. As such, prehistoric is not an outstandingly remarkable value.

Middle Fork Hood River

Findings Summary: Geology/hydrology and scenery are outstandingly remarkable values for the Middle Fork Hood River. The river is bound on the east by the Parkdale lava flow, an excellent example of an A'a type of flow which is typified by rough, jagged and cindery surfaces. The Parkdale lava flow is nationally significant representing a unique opportunity for scientific study. The scenery is highly memorable and photographic due to the lava flow and unique vegetative patterns that result. Fisheries is also an outstandingly remarkable value because of a core population of bull trout, an Endangered Species Act-listed species. The heart of spawning and rearing habitat for this bull trout population is Laurance Lake and its two tributaries, which are just above the wild and scenic designation for the Middle Fork Hood River. The wild and scenic river serves as a critical link for this population to the Columbia River, which provides additional adult rearing and foraging habitat, as well as connections to populations in nearby basins

River Description

The Middle Fork Hood River has its origins in several glaciers on the north slope of Mt. Hood in Oregon's Cascade Range (see Map 7). The Clear Branch, Coe Branch and Eliot Branch join to form the Middle Fork Hood River near the Parkdale Lava Beds. The river flows in a northerly direction, joins the West and the East Fork and eventually flows into the Columbia River near the town of Hood River, Oregon. The designated segment of the Middle Fork Hood River is located within the Lower Middle Fork Hood River and the Upper Middle Fork Hood River subwatersheds (12th-field HUC 170701050505 and 170701050504 respectively).

The river is bounded on the east side by the Parkdale Lava Beds, an excellent example of an A'a (pronounced "ah ah") type of lava flow which is typified by rough, jagged and cindery surfaces. Large deposits of stream and lake sediments at the upper end of the lava flow indicate that the river was once dammed by the lava flow. High-quality flows of this nature are rare for the region and can be considered a "textbook" example, which can be easily studied and interpreted.



Figure 12. Middle Fork Hood River

Discussion of River Values

Free-flow Condition

The hydrograph is generally flashy with short duration, high volume floods which result from the steep watershed topography as well as rain-on-snow events. Peak flows generally occur during winter months while low flows typically occur during September or October. Many watershed tributaries have very low summer flows, while tributaries with glacial sources maintain higher summer flows. In addition to intense precipitation, outburst floods and debris flows periodically occur when natural dams created by moraines at Mt. Hood's receding glaciers break. The U.S. Geological Survey National Water Information System does not operate a gage on the Middle Fork Hood River. There is however an Oregon Department of Fish and Wildlife gage located downstream of the designated segment on the mainstem Hood River. Oregon Department of Fish and Wildlife also collects spring and summer flow data in the lower Middle Fork Hood River and near the mouth of Tony Creek.

In the greater Hood River Basin, there is a lack of adequate streamflow during the summer months (Bureau of Reclamation 2015). This shortage is expected to be exacerbated by climate change as the basin's natural runoff is projected to increase during the fall and winter months and decrease during the spring and summer months when water uses are greatest; the main irrigation season is April 15th to October 1st with peak usage in July. Hood River basin streamflow relies heavily on snowmelt at the beginning of summer and Mount Hood glacial melt during August and September of each year. Warming temperatures in future years will increase the speed of snowpack and glacial melting. Also, glaciers and

snowpack are projected to continue to decrease in size and volume. Currently, between 50 and 70 percent of flow during the irrigation season is provided from glacial melt. Once the Mount Hood glaciers fully recede, the basin will lose one of its largest water sources (Bureau of Reclamation 2015).

Within the designated segment, the Middle Fork Hood River is free-flowing without impoundments, impingements, or diversions. Instream flows in the designated segment (between the Eliot Branch confluence and the Middle Fork Hood River mouth) are helped by an Oregon Water Resources Department water right (1991) for instream flows to benefit fisheries. The right fluctuates between 150 cubic feet per second and 246 cubic feet per second depending on the time of year, with the greatest flow during May, June and July.

Upstream of the segment the Middle Fork Irrigation District manages one dam (Clear Branch Dam) and three irrigation diversions (on Coe Branch, Elliot Branch, and Clear Branch) that reduce instream flows and impact stream temperatures downstream. The impoundments result in changes to the natural sediment and flow regime, recreation, fish, and wildlife values within the designated segment of the Middle Fork Hood River. A flow stipulation below Clear Branch Dam was established by agreement with Oregon Department of Fish and Wildlife (1962) and amended in 1982. Within the bypass reach of the Coe diversion a two cubic feet per second flow was stipulated by Oregon Department of Fish and Wildlife (2009). To date there has not been a formal minimum flow rate stipulated below Coe or Eliot branch diversions. However, the Clear Branch Dam Improvement Project (undertaken by the National Resource Conservation Service) is currently underway and as part of the project, adequate instream flows for sustainable fisheries are being analyzed.

Water Quality

Water quality within the designated segment of the Middle Fork Hood River is fair. Stream temperature and sediment are the dominant water quality concerns, in part resulting from anthropogenic influences such as dams and roads. The Western Hood Subbasin Total Maximum Daily Load was approved in June of 2018. The segment is also considered water quality limited (303(d) listed) by the Oregon Department of Environmental Quality for iron and biological criteria.

The Clear Branch Dam on Laurance Lake adversely impacts downstream stream temperature in the spring and early summer (when the reservoir is full) by releasing water from near the lake's surface; cold water, however, is released from an outlet near the bottom of the reservoir for much of the summer. Alterations to the dam are currently being considered. The Forest Service has collected long-term stream temperature data from within the designated Middle Fork Hood River segment. The Oregon Department of Fish and Wildlife, Middle Fork Irrigation District, and Hood River Watershed Group also have stream temperature data for the Middle Fork Hood River. Additionally, the Confederated Tribes of the Warm Springs have long-term data at one site within the watershed.

Outstandingly Remarkable Values

Recreation

Evaluation of Present Situation

Due to the very limited access and infrastructure in this corridor, recreational opportunities are not readily available for forest visitors. There are no trails, very limited road access and rafting/paddling access is not particularly safe. Recreationists that are more adventurous may enjoy activities, such as photography, fishing and hiking, in the area as well as extreme kayaking access during the summer months. Use is mainly local and dispersed in nature, including some camping and off-trail hiking.

Currently, there are no existing facilities. The area has a high potential for interpreting volcanic processes that could attract users from around the region to view the Parkdale lava flow (see the Geology/Hydrology section for more details), however, this would require a large financial investment and there are no plans to enhance the conservation education in the area.

Finding

The Forest Plan included recreation as an outstandingly remarkable value because of the potential regional importance of the area for interpreting volcanic processes, but this was removed in the 2013 evaluation because those activities had not occurred and there were no plans to enhance conservation education in the area. Due to limited accessibility and limited recreational opportunities, the Middle Fork Hood River wild and scenic river corridor does not provide opportunities unique within the region, nor does it meet the evaluation criteria defined in the most recent evaluation. Thus, recreation is not found to be an outstandingly remarkable value.

Scenery

Evaluation of Present Situation

The Middle Fork Hood River flows along the western edge of the Parkdale Lava Beds. This flow provides substantial scenic variety and very rare and unique rock forms. Vegetation patterns and stream characteristics are found in other locations in the region yet are still relatively unique.

The views of lava flows and unique rock forms have been found to visually unique within the region of comparison. Views and photo attractions are substantial with combination of lava flows, adjacent stream, vegetation, and in places long distance views of the Mt. Hood area. The Middle Fork Hood River originates from several glaciers on the north slope of Mt. Hood. The Clear Branch, Coe Branch and Eliot Branch join to form the Middle Fork Hood River near the Parkdale Lava Beds. The river flows in a northerly direction, joins the West and the East Fork, and eventually flows into the Columbia River near the town of Hood River, Oregon. Large deposits of stream and lake sediments at the upper end of the lava flow indicate that the river was once dammed by the lava flow. High-quality flows of this nature are rare for the region and can be considered a "textbook" example which can be easily studied and interpreted.

The lava flow provides an excellent example of successional stages taking place in the reestablishment of vegetative cover on the lava flow. The southern, or upper, end of the flow already has trees and other vegetation becoming reestablished. The northern, or lower, end of the flow is still virtually barren. The diversity throughout the lava flow provides a unique display of natural processes in action in one location.

Finding

The Middle Fork Hood River has unique and highly memorable views, which are uncommon within the region of comparison. The Parkdale Lava Flow contributes significantly to the scenery so that it is considered an outstandingly remarkable value.

Geology/Hydrology

Evaluation of Present Situation

The large stratovolcano cone of Mount Hood dominates the watershed. The cone was constructed of relatively recent lava flows and pyroclastic flow deposits on an eroded platform of older volcanic rocks. Mount Hood has undergone considerable glacial erosion. The glaciers that remain high on its flanks are mere remnants of what they once were. Beyond the base of the volcano, the older volcanic rocks form lower elevation ridges and drainages. The Middle Fork Hood River drainage begins high up, adjacent to

the cone of the volcano, where numerous large-scale debris flows initiate in glacial deposits. Downstream, the Parkdale lava flow erupted in the paleo-channel of the drainage, causing the diversion of the stream to the West, where active erosion is taking place. Large debris flow deposits at the upper end of the lava flow indicate that the river was once dammed by the lava flow.



Figure 13. Middle Fork Hood River (river mile 7.5) with lava flow

Finding

The Parkdale lava flow provides an excellent example of an A'a type of flow which is typified by rough, jagged and cindery surfaces. Geologically young lava flows of this nature are rare in the region and considered a “textbook” example that can be easily studied and interpreted. The juxtaposition of large debris flows and young lava flows is not found anywhere else within the region of comparison; and for this reason, geology is considered an outstandingly remarkable value.

Fisheries

Evaluation of Present Situation

Fish populations

Three Endangered Species Act-listed species (bull trout, coho salmon, and steelhead), and their designated critical habitat are present within this segment of Middle Fork Hood River and it is considered to play a part in the recovery of federally listed Lower Columbia River steelhead trout and Columbia River bull trout. This segment also includes Chinook designated critical habitat. The Middle Fork Hood River provides the majority of habitat for bull trout, and the Upper Middle Fork Hood River segment is considered the stronghold for the Hood River Basin population. In addition, there are native cutthroat trout, rainbow trout, sculpin, and likely lamprey present in the segment. Rainbow trout have been regularly stocked in Laurance Lake, just upstream of the segment, and are likely present in downstream Middle Fork Hood River reaches. The coastal cutthroat trout seem to be at healthy populations and have generally not been influenced by hatchery/stocked runs.

The Hood River has one core area population of bull trout within this segment. The interagency Hood River Bull Trout Working Group determined in recent years that there is only one bull trout core area in the Hood River Basin and that is the core area upstream of Clear Branch Dam. It has been determined that most, if not all bull trout observed downstream of Clear Branch Dam, and continuing down to the Columbia River, are fish that migrated or were entrained through Clear Branch Dam, and thus originated from the bull trout population that inhabits Laurance Lake, Clear Branch, and Pinnacle Creek, all above Clear Branch Dam. Specifically, below Clear Branch Dam bull trout are found in Clear Branch, Coe Branch, Eliot Branch, Bear Creek, Tony Creek, and the Middle Fork Hood River. Critical habitat has been designated throughout the Middle Fork Hood River watershed. Bull trout are considered a unique species because it is the only remaining natural population on forest, as well as Northwest Oregon. Current evidence suggests that reproduction is limited to the Middle Fork Hood River basin (Starceovich and Jacobs 2010). The population is considered very small, estimated to be less than 300 adults.

There are no current passage facilities in operation at Clear Branch Dam to safely move fish downstream or upstream over the facility. Although it is believed that there are some bull trout that are moving downstream past the dam via seasonal spill events, there are currently no efforts to capture those fish that survive and attempt to return to natal habitat upstream of Clear Branch Dam. The Middle Fork Irrigation District is planning to install fish passage facilities in the future. Once those facilities are in place, and more bull trout expand and utilize river segments below Clear Branch Dam, the habitat in the wild and scenic segment of the Middle Fork Hood River will become key habitat for the recovery of bull trout in the Hood River basin. Access to the Columbia River via this segment also allows for connections to other nearby basin populations, such as the Klickitat River and the Deschutes River.

Lower Columbia River steelhead in the Hood River Basin include both winter and summer runs, however only Winter steelhead are known to occur in the Middle Fork Hood River. Both winter and summer runs are supplemented by Hood River derived hatchery stock.

Spring Chinook salmon are present in this Middle Fork Hood River segment. The native Hood River spring Chinook run is extinct (Confederated Tribes of Warm Springs and Oregon Department of Fish and Wildlife 1991), but a hatchery program has reintroduced this naturalized run in the mid-1990s from Deschutes River stock, and supplementation continues to the present.

Coho salmon are present in this Middle Fork Hood River segment, which provides limited spawning and rearing habitat. Coho salmon are a minority anadromous species in the Hood River compared with

Chinook salmon and steelhead. The number of returning adults varies widely, averaging 243 per year but ranging from 13 to 1020 in the period 1992 to 2009, and a large proportion of the escapement is made up of hatchery strays from other river systems (Reagan 2011).

Freshwater mussels are a species that is receiving increasing attention in the Pacific Northwest. The Xerces Society maintains a species distribution database for western freshwater mussels. Although the database has no records of freshwater mussel presence on the Mt. Hood National Forest, there is a record for western pearlshell from a tributary to Trout Creek near Dee. Trout Creek is a tributary to the East Fork Hood River just upstream of the East Fork Hood River/Middle Fork Hood River confluence. The record suggests that western pearlshell could occur on the Mt. Hood National Forest, and potentially in the Middle Fork of Hood River, although no observations have been reported (Blevins, personal communication 2018). Fish habitat

This segment of Middle Fork Hood River provides habitat for Pacific Northwest (U.S. Forest Service Region 6) threatened, endangered and sensitive species. Several Federally listed (threatened) salmonid species and their critical habitat are present in the segment of Middle Fork Hood River, including Columbia River bull trout. The Middle Fork Hood River in this segment has little to no road access and, coupled with adjacent stream side areas composed of vertical cliff walls and rough lava rock flows, there are very few human visitors and associated impacts. In contrast, glacial streams, such as Coe Branch and Eliot Branch contribute naturally high turbidity and sediment levels, as well as regularly occurring large debris flows. The recent receding of glaciers on Mt. Hood has increased these flow frequencies in the last several decades.

The quality of the aquatic habitat within the wild and scenic river segment ranges from good to poor. Ecosystem processes, such as floodplain function, large wood recruitment, water quality (related to chemicals/nutrients), and streambank function, are mostly intact and functioning well. However, the use of Clear Branch, Coe Branch, and Eliot Branch for irrigation and hydropower development have impaired flow regimes and sediment routing, increased water temperatures, blocked fish migration, and limited channel function. As a result, salmon and trout spawning and rearing habitat in this segment is degraded from its historic condition, but is still providing important habitat for listed fish species.

Finding

The fish population in the wild and scenic segment of the Middle Fork Hood River are an outstandingly remarkable value because of the regional significance of the existing small population of federally-listed Columbia River bull trout. This is the only natural population of bull trout left on the Mt. Hood National Forest, as well as Northwest Oregon. The wild and scenic river corridor serves as a critical link/corridor to the Columbia River, which provides for adult rearing and foraging habitat, as well as connections to other populations in nearby basins, such as the Klickitat and Deschutes River. Other species exist in this segment, but are not unique as compared to other watersheds in the region.

The fish habitat in the wild and scenic river segment of the Middle Fork Hood River are somewhat unique due to the lack of human access and evidence, but not an outstandingly remarkable value within the region of comparison. The habitat is largely unaltered by human visitation impacts, but the hydrologic regime is measurably altered by water withdrawals for irrigation and hydropower in upstream tributaries.

Wildlife

Evaluation of Present Situation

The Middle Fork Hood segment does not support diverse or abundant wildlife species due to steep cliffs, open lava beds and roads (on outer edge) adjacent to much of this corridor. Travel corridors for wildlife are limited. The corridor does provide some linkage between big game wintering range and calving/fawning areas. The regular glacial outburst floods through this segment precludes beaver colonization and the floodplain habitat is homogenous with early seral alders and forbs dominating.

Although within northern spotted owl (federal threatened species) critical habitat, most of the corridor does not provide late seral or suitable nesting habitat for spotted owl, but it does provide habitat for dispersing owls. The late seral habitat that does remain is fragmented and isolated which in turn impacts the abundance, distribution, and population integrity of late seral forest associated wildlife species. Many of the older harvest areas lack a legacy of snags and down logs which are necessary to maintain species that are dependent on these components.

Finding

The Middle Fork Hood River corridor is not considered to be high quality wildlife habitat, nor does it serve as an important wildlife travel corridor, thus wildlife is not an outstandingly remarkable value.

Historic

Evaluation of Present Situation

Euro-American sites include those related to themes such as government (administrative sites and lookouts), transportation (roads, trails, and a railroad), communication (telephone lines), settlement (cabins and small farms), waterworks (ditches and dams), the Civilian Conservation Corps, hunting (pine marten sets), logging (sawmills and flumes), and mining. Transportation, settlement, irrigation, logging and trapping sites are found throughout the Hood River Valley in which settlement by Euro-Americans began in the 1850s.

Finding

This segment did not meet the criteria for an outstandingly remarkable value for historic resources because historic resources were not found to be rare, unique or exemplary within the region of comparison.

Prehistoric

Evaluation of Present Situation

American Indian sites include seasonal camps, lithic scatters, rock features, peeled cedar trees, and isolated tools. The Mt. Hood National Forest is a meeting place for the Columbia Plateau, Northwest Coast, and Great Basin culture areas. Although characteristics of all three cultural areas are likely visible in the West Fork Hood River, the subbasin probably fits best with the Columbia Plateau culture area. Prehistoric sites in the subbasin reflect the various aspects and types of culture use and include probably seasonal camps, lithic scatters, large dart points, small and delicate arrow points, peeled cedar trees, and berry hearths.

Finding

There is confidential prehistoric information that cannot be disclosed that is relevant to evaluating rivers for this value. No sites within this river corridor have rare or unqiure characteristics within the region of comparison. As such, prehistoric is not an outstandingly remarkable value.

South Fork Clackamas River

Findings Summary: Scenery is the outstandingly remarkable values for the South Fork Clackamas River. The river flows through a narrow canyon with large rock outcrops and cliffs, a 100-foot waterfall in the lower part of the segment and old-growth trees along the river add to the visual diversity. This waterfall (pictured on the cover) is highly memorable and often photographed. It is a destination for recreationalists throughout the region of comparison and beyond. Also, the South Fork Clackamas River is designated as an Oregon State Scenic Waterway.

Historical resources are another outstandingly remarkable value for this river segment. The South Fork Water Board pipeline and associated features are unique with the region of comparison. These features served Oregon City and West Linn from 1915 through 1985 when they were decommissioned. The system was expanded with the help of one of Franklin Roosevelt's New Deal recovery programs, the Works Project Administration.



Figure 14. South Fork Clackamas River

River Description

The South Fork Clackamas River is a tributary of the Clackamas River, generally oriented south to north, on the western slope of the Cascade Range in northwest Oregon (see Map 8). The upper terminus of the

segment is at the confluence with the East Fork South Fork. The lower terminus is at the river's mouth at the Clackamas River. This segment of the South Fork is mostly a 3rd and 4th-order perennial reach. Elevation of the termini range between about 1,900 and 600 feet above mean sea level. This segment lies within the South Fork Clackamas subwatershed (12th-field HUC 170900110404). The contributing watershed is mountainous, with a somewhat parallel drainage pattern comprised of several long named tributaries, the largest of which is Memaloose Creek. This segment is located primarily within the Clackamas Wilderness, which was designated in the Omnibus Act.

This segment of the South Fork Clackamas has a very confined bedrock channel that is highly incised, with a moderate to high gradient. It flows within a narrow, cliffed canyon in which a 100-foot waterfall and old-growth trees along the river add to visual diversity. Seasonally, deer and elk are in the area, and spotted owls and bald eagles call the segment home. Most of the watershed, filled with Pacific silver fir, Douglas fir and western hemlock, is managed by the Forest Service. The entire segment is out of sight and inaccessible by road.

Oregon Scenic Waterway Designation

South Fork Clackamas River from river mile 4 to the main stem of the Clackamas River was designated as part of the Clackamas River State Scenic Waterway through Oregon Administrative Rule 736-040-0044 in 1985. This description was updated in 2007, the designated waterway extends from "its confluence with an unnamed tributary near the western boundary of Section 7, Township 5 South, Range 5 East, Willamette Meridian, downstream to the confluence of the South Fork Clackamas River with the Clackamas River" (Oregon Revised Statutes). This section is classified as a Scenic River Area.

The goals of Oregon's Scenic Waterways program are to: protect the free-flowing character of designated rivers; protect and enhance scenic and natural values, recreation, and fish and wildlife; promote expansion of the scenic waterways system; protect private property rights; and, encourage other agencies to act consistently with the goals of scenic waterways management. Designated Oregon Scenic Waterways are categorized into classification areas; the South Fork Clackamas River is designated as a Scenic River Area classification. Scenic River Areas are areas that meet the following criteria.

- a. Those designated scenic waterways or segments thereof with related adjacent lands and shorelines still largely primitive and largely undeveloped, except for agriculture and grazing, but accessible in places by roads. Scenic River Areas may not include long stretches of conspicuous or well-traveled roads paralleling the river in close proximity, but may include extensive areas in agricultural use.
- b. Scenic River Areas will be administered to maintain or enhance their high scenic quality, recreational value, fishery, and wildlife habitat, while preserving their largely undeveloped character and allowing continuing agricultural uses.

Related adjacent lands includes all lands within a quarter mile of the bank of the designated waterway, similar to the interim wild and scenic river corridors. The highest and best uses of the waters within the scenic waterways are recreation, fish and wildlife uses. The state statute require that "the free-flowing character of these waters shall be maintained in quantities necessary for recreation, fish and wildlife uses." The Oregon Water Resources Department determines appropriate flows associated with scenic waterways.

Discussion of River Values

Free-flow Condition

There are no longer any stream gages on this segment of the South Fork Clackamas, but at one time, a gage was operated near the mouth where there used to be two diversions (operated by the South Fork Water Board) that served as a source for municipal use. One intake was on Memaloose Creek and the other on the South Fork. There are several gages in operation further downstream on the Clackamas River. Generally, peak flows for this basin occur in the winter and early spring months in response to heavy precipitation, runoff, and snowmelt, while base flows typically occur during late summer and early fall.

This river segment is considered free flowing and without impoundments. The South Fork Water Board has transferred or amended their water rights within the segment, and since they are no longer diverting water from the river, it is not considered regulated. There are no other known water rights in the segment.

There are several noteworthy naturally occurring fish passage barriers, including a scenic 100-foot vertical waterfall just upstream from the confluence with Memaloose Creek, as well as several very large log jams further up the stream. There is also a smaller waterfall on Memaloose Creek near its confluence with the South Fork Clackamas.

Water Quality

Water quality within this segment of the South Fork Clackamas River is generally good. Water quality was sampled for turbidity by the Water Board from 1970 to 1984 as required by municipal suppliers to monitor compliance with the Safe Drinking Water Act. Data indicated that there were occasional exceedances of turbidity standards that periodically occurred in response to heavy storm runoff. Turbidity was also sampled for an 8 month period after the 36-Pit Wildfire in 2014. Data was not decisively conclusive, but it suggested that there may have been a period time during the following wet season when turbidity became somewhat elevated. Stream temperature has also been monitored at various intervals; data compiled for the Aquatic and Riparian Effectiveness Monitoring Program indicates that the State's 7-day maximum stream temperature standard for fish had been exceeded a number of times during late summer months downstream of the segment. It is not however on the Oregon Department of Water Quality 303(d) list of impaired waters because a total maximum daily load for stream temperature has been established (2006).

The steep terrain in the segment's gorge is susceptible in places to mass wasting, and there are debris flow-prone tributary channels that are periodically sources of sediment. Timber harvest and road construction in past decades was extensive in the contributing watershed, and there is a high likelihood that varying degrees of additional sediment has been contributed over time. Efforts to alleviate those effects began in the mid-1990s, which included closing and decommissioning roads. Since then, the Clackamas Wilderness was designated (2009), which should also diminish anthropogenic sediment sources as timber extraction and road construction/motorized uses in the area are now prohibited.

Outstandingly Remarkable Values

Recreation

Evaluation of Present Situation

The South Fork Clackamas River represents a vestige of wild and scenic America. The South Fork has been discovered by the whitewater community, and provides a hike-in backcountry opportunity for skilled boaters. Trail use includes day hiking, horseback riding, mountain biking, backpacking, and provides access to catch-and-release fishing. Some extreme kayaking and canyoneering takes place on this wild stretch of river. Class II to IV rapids and several waterfalls challenge kayakers. Woody debris and log jams are frequent and present challenges to paddlers. The Hillockburn Trail #516, which provides the only access to the lower river corridor, is 3.2 miles round trip. It is usually open from mid-March to December, and is moderately difficult.

The close proximity to the metropolitan area of Portland results in increasing popularity and higher recreation demand, as the city continues its rapid growth trend. A diversity of recreational opportunities exists, including whitewater paddling, hiking, and wilderness experiences.

The steep slopes and unroaded character of the South Fork River and lack of infrastructure limit recreational use. Dispersed camping does occur at the confluence of the South Fork and mainstem of the Clackamas River, mainly by boaters.

Finding

No developed recreation exists, but river use is common. Most visitors are in the area to view the waterfall and to possibly find extreme kayaking and canyoneering opportunities as well as some catch-and-release fishing. Much information exists on this river for kayaking and canyoneering. These opportunities exist elsewhere at other more preferred locations within the region of comparison. Although this river provides a spectacular view, recreation is not found to be an outstandingly remarkable value.

Scenery

Evaluation of Present Situation

The river flows through a narrow canyon with large rock outcrops and cliffs, a 100-foot waterfall in the lower part of the segment and old-growth trees along the river add to the visual diversity. Most of the watershed is filled with Pacific silver fir, Douglas fir and western hemlock. This lower section has been designated as an Oregon State Scenic Waterway. Today the river receives high use from the public, although no developed recreation sites currently exist. The South Fork Clackamas waterfalls have been recorded as highly memorable, with exemplary visual features including many photographs found online, in social media, and on other recreational related websites. See the cover photo and Figure 15 for pictures of the waterfalls. The Oregon City Waterworks facilities, part of the South Fork Water Board, are historically significant in the area, and while man-made, they contribute, rather than detract, from the scenery in the area.

Finding

The scenic resources in South Fork Clackamas River were identified as outstanding based on the evaluation criteria, and therefore scenery is an outstandingly remarkable value for this river. The river corridor includes unique and highly memorable views of forested waterfalls. South Fork Clackamas River provides unique views uncommon within the region of comparison, including not only picturesque

waterfalls, but also man-made features from the historic Oregon City Waterworks facilities, which contribute to the unique views. There are indications the area is photographed by the visitors, and the scenic resources are unique for the area.



Figure 15. Lower Falls on South Fork Clackamas River

Geology/Hydrology

Evaluation of Present Situation

Most of the watershed lies within the Western Cascade physiographic province, a thick sequence of interbedded lava flows, pyroclastic flows, and volcanic deposits. This drainage, however, was inundated by, and is underlain by, two members of the Columbia River Basalt Group. The 17 to 15 million year old Grand Ronde Basalt is overlain by the 15 million year old Wanapum Basalt. Between these two units is a sedimentary interbed known as the Vantage Horizon. This weak interbed is easily erodible, causing the overlying basalt to fail, forming large benches adjacent to the river. Where the river flows over these benches, waterfalls up to 100 feet in height can be found.

Finding

Although this drainage contains a 100-foot waterfall, the above geologic features can be found in other rivers throughout the region and are considered relatively common. Opportunities to view “textbook”

geologic examples do not readily present themselves. Because these features are not unique within the region of comparison, geology does not represent an outstandingly remarkable value.

Fisheries

Evaluation of Present Situation

Anadromous fish are limited to the lower 0.4 miles of the South Fork Clackamas River by a 100-foot waterfall. Endangered Species Act federally-listed winter steelhead, late-run coho, and spring Chinook occupy this section for spawning and rearing. The basin is not a significant producer of wild listed fish because of the barrier falls and the short stream reach below the falls. Cutthroat trout, rainbow trout, and Eastern brook trout (non-native), sculpin, large scale sucker, and longnose dace are present in the mainstem South Fork Clackamas River.

The historic variety of fish are present, with a few exotic additions. Non-native brook are stocked in Williams and Memaloose lakes (upstream of the segment) and can be found downstream in a few locations among the native stocks. Although now the dominant fish species in Memaloose tributary, which is immediately upstream of the segment. It is not known if the Brook trout in Williams Lake have escaped and are found in the mainstem South Fork Clackamas River. Non-native trout pose a future threat to native cutthroat, rainbow, and bull trout through competition for food and available habitat if they expand their distribution. Brook trout could also hybridize with bull trout, which is an additional threat.

The riparian areas have been relatively undisturbed and large wood recruitment is excellent in the lowermost section below the falls. Above the falls, the riparian areas have been impacted by past timber harvest and road building. Limited stream temperature data is available for the South Fork. Two sites that were monitored exceeded the state water quality standard for the 7-day average. Turbidity measurements have shown nothing out of the ordinary. All reaches of the South Fork Clackamas is below forest standard for pool habitat.

Finding

Fish population and habitat within this segment is not considered an outstandingly remarkable value because of the limited extent of Endangered Species Act-listed fish, and because the resident fish assemblage in the South Fork Clackamas River is commonly encountered within the forest and the region of comparison.

Wildlife

Evaluation of Present Situation

The South Fork Clackamas River segment contains quality riparian habitat, with large tracts of late-successional stands, recent fire activity, nearby cliffs, and the waterworks tunnels that contribute to the high wildlife species diversity in this area. The majority of this river segment is within designated wilderness.

One federal threatened species is found in these segments, the northern spotted owl. There are two northern spotted owl core nest areas in the corridor. The 2014 36 Pit Fire burned into one of the northern spotted owl core nest areas, but it was mostly low intensity burn that did little to impact this habitat. Nearly the entire river segment is considered suitable northern spotted owl habitat.

Two Forest Service sensitive species are documented in this corridor. The Cope's giant salamander is known from the upper portion of the river segment. Townsend's big-eared bat has been documented, with

the abandoned South Fork Waterworks tunnels providing habitat for several bat species within the river segment. Habitat is suitable for harlequin duck (another Forest Service sensitive species), but no formal surveys have occurred and no incidental sightings have been recorded. Though just outside the corridor, an active peregrine falcon nest is on an adjacent cliff.

Three other management species are known to inhabit this area, the pileated wood pecker (forest management indicator species), pine marten (forest management indicator species), and red tree vole (Northwest Forest Plan survey and manage). The entire river segment is considered deer and elk winter range. The 2014 36 Pit Fire has increased the quantity and quality of available forage.

Finding

Although the South Fork Clackamas River corridor contains quality riparian habitat and diverse wildlife species, this diversity is can be found on other river corridors elsewhere on the Mt. Hood National Forest, as well as other rivers within the region of comparison. Neither wildlife species nor habitat is found to be an outstandingly remarkable value on this river segment.



Figure 16. Part of the South Fork Water Board Pipeline

Historic

Evaluation of Present Situation

In 1913, the young cities of Oregon City and West Linn suffered a serious outbreak of typhoid from an increasingly polluted Willamette River, their sole source of water at the time. The incident spurred Oregon City's leaders to appoint a "Pure Mountain Water League" and directed it to locate a safer source of drinking water. The League settled on the pristine South Fork of the Clackamas River in the Cascade foothills. A South Fork Water Board was created to carry out this ambitious project. By the fall of 1915, the new water district had managed to lay twenty-six miles of 18-inch pipe from a site at the confluence of Memaloose Creek and the South Fork Clackamas all the way to Oregon City and West Linn. The new pipeline began to carry municipal water on October 7, 1915.

In 1939, the South Fork Water Board expanded the system with the help of one of Franklin Roosevelt's New Deal recovery programs, the Works Project Administration. This project extended a 24-inch pipeline upstream from the Memaloose Creek intake to a point upstream, above the 100-foot main falls on the South Fork. This project involved carving a series of three dramatic tunnels and a cantilevered pipeline through solid basalt cliffs.

The new intake improved water pressure downstream, and this system continued to serve as the water supply for the two cities until a new filtration plant was constructed on the lower Clackamas River, in 1958. Both systems were used until 1985, when the South Fork pipeline was decommissioned. Since then, the network of roads, tunnels, plank walkways, log bridges and old pipeline has slowly been fading into the green rainforest of the South Fork canyon.

Finding

The water pipeline and associated features are unevaluated, but there is a high likelihood that they are eligible as an historic district. The area and sites were evaluated by Mt. Hood National Forest in 1983 and determined to be ineligible based largely on the fact that some features were not 50 years old at that time. The South Fork Water Board pipeline and features are river dependent, and unique within the region of comparison. As such, this segment meets the historic criteria for outstandingly remarkable.

Prehistoric

Evaluation of Present Situation

There is a high density of prehistoric localities identified despite limited surface visibility. It is likely that high late-summer productivity of plant and animal resources near the river combined with the presence of Clackamas salmon runs to make the river and its nearby landforms particularly desirable places for human use throughout much of the prehistoric past. The relatively high density of archaeological remains near the river is an indication of its importance. The type of prehistoric localities (lithic scatters and peeled trees) reflects at least two of the primary economic pursuits practiced in the vicinity of the river – big game hunting and fiber collection for containers and clothing. It is probable that containers were used to transport huckleberries and other upland resources from their primary habitat further upslope to residential locations on the lower Clackamas and Cascade marginal valleys. Salmon fishing was likely to have been another important prehistoric activity.

Finding

There is confidential prehistoric information that cannot be disclosed that is relevant to evaluating rivers for this value. No sites within this river corridor have rare or unique characteristics within the region of comparison. As such, prehistoric is not an outstandingly remarkable value.

South Fork Roaring River

Findings Summary: Botany is the outstandingly remarkable value for the South Fork Roaring River. The high quality habitat for cold water corydalis, a Forest Service sensitive species that is critically imperiled in Oregon, within the corridor make it an outstandingly remarkable from a botanical standpoint.



Figure 17. South Fork Roaring River

River Description

The South Fork Roaring River originates in the Rock Lakes Basin in the Roaring River Wilderness (see Map 9). The area is in the Cascade Mountain Range in northwest Oregon. The entire 4.6-mile segment of the South Fork Roaring River from its headwaters to its confluence with the Roaring River is administered as a wild river. The river flows through a narrow, deeply incised canyon, which has large rock outcroppings and cliffs along portions of the canyon. The drainage is characterized by a variety of stream complexes including large log jams present in the upper river, large and small landslides, and small waterfalls alternating with large pools. This segment lies within the Roaring River subwatershed (i.e., 12th-field HUC 170900110402).

Old-growth trees are predominant along the river, and the river itself flows over numerous cascades and through several pools. The corridor provides prime quality habitat for northern spotted owl, and owls are

known to nest there. With almost no development within and around the corridor, habitat quality is considered excellent.

Discussion of River Values

Water Quality

The designated segment of the South Fork Roaring River has limited access by roads and trails which has helped to maintain good water quality. The river is not on the Oregon Department of Environmental Quality 303(d) list as impaired by pollutants, however, the segment does have a total maximum daily load for temperature (2006).

Water quality monitoring data is limited. Water chemistry sampling (which did not include microbiological sampling) was conducted at the mouth of Roaring River in 1991. Grab samples were taken at four separate times in August and September. Water samples were analyzed for the full spectrum of organic and inorganic constituents. Results indicated a high level of water purity. In addition, trend monitoring in 1993 indicated low sediment levels. Repeated aquatic macro-invertebrate sampling was conducted at the mouth of the Roaring River in the early 1990s. Results indicated the river was “slightly impaired” because of a high percentage of sediment tolerant mayflies, a low percentage of intolerant mayflies, a very high percentage of taxa in the collector/gathers functional feeding group and a low percentage of taxa in the shredders functional feeding group. Modeled stream temperatures (from NorWest) are well below the state standard. Contamination from recreational use at dispersed sites along a segment of trail adjacent to headwater riparian areas could be a concern. However, no microbiological monitoring has been conducted and the extent and impacts are unknown. The climate change vulnerability assessment of National Forests and Grasslands in the Pacific Northwest does not indicate changes in peak or low flows are likely to impact water quality.

Free-flow Condition

The designated segment of the South Fork Roaring River is located within the transient snow zone where snow accumulates and melts more than once per winter, often by rain-on-snow events. The subsequent high flows can occur in both midwinter and early spring while low flows generally occur in the late summer. Storms in between October and April are not uncommon. Peak and base flows seem to have remained relatively stable through time. No longer in operation, there used to be a U.S. Geological Survey gaging station at the confluence of the Clackamas and Roaring Rivers.

The designated South Fork Roaring River segment is located within the Roaring River Wilderness, and is without constructed facilities that could impact its free-flowing condition.

Outstandingly Remarkable Values

Recreation

Evaluation of Present Situation

The corridor is entirely in the Roaring River Wilderness, and uses are limited to wilderness-compliant activities such as hiking, horseback riding, dispersed camping, photography, and nature viewing. Use in the corridor is light compared to other parts of Mt. Hood National Forest.

The river is not the destination in this area, but rather the nearby lakes outside the corridor provide the more interesting recreation experience. The Fraizier Turnaround Trailhead is the main access point to the Serene Lake Trail #512, which is the only trail within the corridor.

Finding

The entire length of this river designation lies within the wilderness, thus limiting the amount and type of use that can be accommodated. There is one trail that goes through the area, but it is not the destination. Nearby lakes are a popular attraction, but lie outside of and on the edge of the corridor. South Fork Roaring River provides an opportunity for solitude, but recreation is not found to be an outstandingly remarkable value for the river.

Scenery

Evaluation of Present Situation

The river flows through a narrow, deeply incised canyon which has large rock outcroppings and cliffs along portions of the canyon. Old growth trees are predominant along the river and the river itself flows over numerous cascades and small waterfalls alternating with several large pools. Long range views are limited from the narrow canyon due to screening. The combination of landscape elements were considered memorable and provide photo opportunities. Human alterations are absent, and will continue to be because the area is designated as wilderness. The river corridor has a natural, unmodified scenic character.

Finding

While South Fork Roaring River has a beautiful old growth setting, the segments did not stand out as highly memorable, highly diverse, or uncommon when compared to other rivers within the area of comparison. The scenic resources were not found to be rare, unique, or exemplary for the area, and therefore the Scenic Resources are not an outstandingly remarkable value for this river.

Geology/Hydrology

Evaluation of Present Situation

Most of the watershed lies within the Western Cascade physiographic province composed of a thick sequence of interbedded lava flows, pyroclastic flows, and volcanic deposits. This drainage, however, was inundated by, and is underlain by, two members of the Columbia River Basalt Group. The 17 to 15 million year old Grand Ronde Basalt is overlain by the 15 million year old Wanapum Basalt. The headwaters of the drainage consist of 8 to 4 million year old ridge-capping basalt and basaltic andesite of the High Cascade volcanic sequence.

Finding

The river corridor has large rock outcroppings and cliffs along the sides of pools along the river. Due to the steep gradient of the river, several cascades as well as some 10 to 20 foot waterfalls exist along the river. The above features can be found in other rivers throughout the region of comparison and are considered relatively common. Opportunities to view “textbook” geologic examples do not readily present themselves. Because these features are not unique within the region of comparison, geology does not represent an outstandingly remarkable value.

Fisheries

Evaluation of Present Situation

Due to historic presence of a 25-foot natural waterfall downstream in the mainstem Roaring River (rivermile 3.3) the South Fork Roaring River does not contain anadromous salmon nor steelhead stocks. The resident fish population is composed of rainbow trout and coastal cutthroat trout, as well as dace,

reticulate sculpin, and mottled sculpin. The fish habitat in the South Fork Roaring River is excellent due to its low level of historic disturbance and its protection within the Wilderness Area.

Within the South Fork Roaring River, various out-of-basin hatchery stock have been stocked in the watershed's headwater lakes to increase fishing opportunities. Species presently stocked include non-native Eastern brook trout in Serene, and Lower Rock lakes, hatchery rainbow trout in Middle Rock Lake, and hatchery cutthroat trout in Upper Rock Lake. All lakes are upstream of the wild and scenic segment, except for Middle Rock Lake. Early 1990's U.S. Forest Service lake surveys noted that stocked trout are able to move downstream into the South Fork Roaring River through lake outlets, such as ones located at Middle Rock and Serene Lakes. Stocked brook trout can pose a threat to native trout through competition for food and available habitat. In addition to this threat, stocked rainbow and cutthroat, can hybridize with native rainbow and cutthroat stocks and dilute or eliminate the native genetic stock.

Finding

The resident fish assemblage and undisturbed habitat in the South Fork Roaring River is frequently found within Mt. Hood National Forest and the region of comparison. Fish population and habitat within this segment is not considered an outstandingly remarkable value.

Wildlife

Evaluation of Present Situation

The South Fork Roaring River segment contains quality riparian habitat, with large tracts of late-successional stands and the Rock ponds in its headwaters, contributing to the high wildlife species diversity in this area. The entire river segment is within designated wilderness.

One federal threatened species is found in these segments, the northern spotted owl. There is one northern spotted owl core nest areas as well as a portion of one additional northern spotted owl home range. The upper portion of the river segment is considered suitable northern spotted owl habitat, with the rest a mix of suitable and dispersal habitat. There are no known Forest Service sensitive species within this segment although habitat is suitable for harlequin duck. No formal surveys have occurred and no incidental sightings have been recorded.

Three other management species are known to inhabit this area, the pileated wood pecker (forest management indicator species), pine marten (forest management indicator species), and red tree vole (Northwest Forest Plan survey and manage). Small herds of deer and elk are present, concentrated in riparian areas. The lower two miles of the river segment is considered deer and elk winter range. Quality beaver habitat and existing ponds are found near the headwaters of the river segment.

Finding

Although the South Fork Roaring River corridor contains quality riparian habitat and diverse wildlife species, this diversity is can be found on other river corridors elsewhere on the Mt. Hood National Forest, as well as other rivers within the region of comparison. Neither wildlife species nor habitat is found to be an outstandingly remarkable value on this river segment.

Historic

Evaluation of Present Situation

There is an old trail #511 that exists in this segment. Trail 511, South Fork Roaring River Trail, was named on most maps prior to the 1970s. It most likely was used as the route connecting to Corral Springs

Trail (#507) at the main stem of the Roaring River, and following the South Fork up to Frazier Turnaround. The trail was originally built following a wildfire in order to do restoration work within the area.

Finding

The trail is a historic resource connected to the river. A evaluation of the trail's eligibility for the National Register of Historic Places has not been completed. The trail is not rare, unique or exemplary within the region of comparison, so it is not an outstandingly remarkable value.

Prehistoric

Evaluation of Present Situation

There is evidence of traditional use throughout the corridor with the identification of numerous eligible prehistoric sites. There may have been some transient use of people passing through the area. Due to difficult access, and the fact that the river is not on a major known travel route, potential for important cultural sites is considered low.

Finding

There is confidential prehistoric information that cannot be disclosed that is relevant to evaluating rivers for this value. No sites within this river corridor have rare or unqiure characteristics within the region of comparison. As such, prehistoric is not an outstandingly remarkable value.

Botany (Other Value)

Evaluation of Present Situation

This river corridor has habitat for cold water corydalis (*Corydalis aquae-gelidae*), a sensitive species on the Region 6 Regional Forester and Oregon/Washington State Director Special Status Species List, and a Survey and Manage species (Northwest Forest Plan). Cold water corydalis is a river-related/river-dependent species. Oregon Biodiversity Information Center has documented cold water corydalis as vulnerable throughout its range (G3), critically imperilled in Oregon (S1) and species of concern. It is also a candidate for listing as threatened or endangered, and on List 1, threatened and endangered throughout its range. No sightings/occurrences of this species in the South Fork Roaring River are documented, but botany field surveys in this area are incomplete.

Cold water corydalis grows along streams of many sizes, from headwater seeps to large rivers (Goldenberg and Zobel 1999). Community composition ordinations indicate that species occurrence is highly correlated with dense western hemlock canopies at lower elevations and with Pacific silver fir and Sitka alder canopies at higher elevations, and, conversely, less so with less dense forest canopies found on larger rivers (e.g., western red cedar, red alder) (Goldenberg and Zobel 1999). Percent canopy cover appears to strongly affect the occurrence of cold water corydalis with its abundance significantly reduced in areas that have been clearcut (Goldenberg and Zobel 1999). The species seems best suited to habitats in which a high, partial canopy allows sufficient light for growth and reproduction, but hinders the establishment of competing vegetation (Montgomery et al. 2017). Cold water corydalis can be found in late-successional riparian forest, mostly in areas not recently subjected to catastrophic floods (Goldenberg and Zobel 1999). . This river corridor includes excellent examples of older-aged climax communities. They are in undisturbed condition and would remain undisturbed since this corridor is in designated wilderness.

Finding

The high quality habitat for cold water corydalis within South Fork Roaring River make this river outstandingly remarkable for botany. Cold water corydalis may be present in the river, and is a river-related/river-dependent species.

Zigzag River

Findings Summary: Scenery and recreation are outstandingly remarkable values for the Zigzag River. Both the Timberline Trail and Pacific Crest Trail are located within the corridor, and the river adds to the recreational experiences for hikers. These trails provide unique long-distance and circle-the-mountain experiences that are nationally recognized. Vistas of Mt. Hood within the corridor are unique and desirable, and contribute to the experiences on these trails. The corridor also includes highly memorable and impressive canyon views.

Macroinvertebrate is also an outstandingly remarkable value. There are only nine populations of the Scott's apatanian caddisfly (*Allomyia scotti*) known in the entire world, all of which are found on the Mt. Hood National Forest. The habitat for this species is present within the Zigzag River.

River Description

The Zigzag River arises from the base of Zigzag Glacier at approximately the 5,000-foot elevation on Mt. Hood in Oregon's Cascade Mountain Range (see Map 10). The segment is located entirely within the Mt. Hood Wilderness. This segment lies within the Zigzag Canyon subwatershed (i.e., 12th-field HUC 170800010202).

The river flows steeply over mud and pyroclastic flows through a sparsely vegetated area in a narrow canyon. The canyon rim itself and beyond is well forested. There are two waterfalls within the segment adding to the diversity of the river. Intrusive rocks within the corridor are responsible for the waterfalls and other structures. This type of geology is found on other volcanic peaks throughout the region, as well as other locations on Mt. Hood, but is limited essentially to the higher elevations of those peaks, making it relatively unique in comparison to other rivers in the region. The river itself is glacial in origin and has a relatively even flow throughout the year, though it varies during spring runoff and rainfall events.

Both the Pacific Crest National Scenic Trail (Pacific Crest Trail) and the Timberline Trail are located within the river corridor. The river contributes to these unique recreational experiences.

Discussion of River Values

Free-flow Condition

The Zigzag River is glacial in origin and has a relatively even flow throughout the year, though it varies during spring runoff and rain-on-snow events. It has a snowmelt hydrograph with peak flows between November and February. Peak flows also occur when jökulhlaup floods descend from the Zigzag Glacier. There is one U.S. Geological Survey gaging station about three miles downstream of the designated river segment.

The river flows steeply over mud and pyroclastic flows through a sparsely vegetated and narrow canyon. The designated segment of river is completely free flowing; while the Timberline Trail (trail #600) does cross the river, it does not constrain the flow.



Figure 18. Zigzag River Waterfalls

Water Quality

There is no ongoing water quality monitoring by Oregon Department of Environmental Quality occurring on the Zigzag River, however the 1988 Department of Environmental Quality non-point source assessment indicated concerns with glacial runoff, unstable channels, and loss of woody debris. These conditions, however, are assumed to be natural, given the river is within the Mount Hood Wilderness and of glacial origin. The only anthropogenic non-point source of pollution would be the Timberline Trail, but it does not appear to be a sediment source. The designated segment of the Zigzag River is not on the State 303(d) list for any pollutant. There is however a total maximum daily load for temperature for the Sandy Basin (2005).

Warming temperatures in future years could increase the speed of snowpack and glacial melting. Glaciers and snowpack could continue to decrease in size and volume. The Climate change vulnerability assessment for National Forests and Grasslands in the Pacific Northwest (2013) assessed changes in streamflow due to declining snowpack. Streamflow vulnerability is described relative to a change in magnitude of recharge at the start of July, August, and September. For the Zigzag River, the vulnerability assessments predicted recharge declines greater than 50 percent (in July). The assessment also indicated a 20 percent increase in peak streamflows by 2080.

Outstandingly Remarkable Values

Recreation

Evaluation of Present Situation

The river corridor is entirely within the Mt. Hood Wilderness, and uses are limited to wilderness-compliant activities, such as hiking, horseback riding, dispersed camping, photography, wildflower viewing, and nature viewing. The Timberline Trail and Pacific Crest Trail provide unique hiking opportunities and cross this river corridor. The river itself does not draw recreation use, but adds to the recreation experience for those in the area.

There are no recreation facilities within the river corridor. There is direct access to the corridor from the Forest Service Road 2639. Trail access is available via many trails and trailheads around Government Camp and Timberline Lodge.

The Timberline Trail is within the Mt. Hood Wilderness, and use is limited to the snow-free season, typically July to October, while there may be limited wintertime access by a small number of individuals. The use is light during weekdays, and portions of the area experience heavy use during the summer weekends, especially when the wildflowers are blooming. The Pacific Crest Trail is a 2,650-mile congressionally designated National Scenic Trail from Mexico and Canada, passing through California, Oregon and Washington. Thousands of hikers and equestrians enjoy this international trail every year. Some trail users may only hike small sections, while others choose to take on the entire trail in one season. While the section of the trail in the Zigzag River corridor is one small part of the Pacific Crest Trail, it is used by visitors from the local area as well as international visitors who come to embrace the challenge, explore, and enjoy the spectacular vistas along this iconic trail.

Finding

The Pacific Crest Trail and Timberline Trail are popular attractants to this river corridor, while providing unique recreation opportunities for long distance hiking, and circle-the-mountain hiking opportunities, while the wildflowers and mountain vistas add to the experience of the area. Visitors travel from all over the region to experience the views provided by this area. International hikers or long distance hikers of the Pacific Crest Trail camp next to the river while passing along to their next destination. With such stunning views and hiking opportunities in the corridor, recreation is found to be an outstandingly remarkable value for the Zigzag River.



Figure 19. Small waterfalls on Zigzag River

Scenery

Evaluation of Present Situation

The Paradise Park area is known for wildflower displays during the summer months, and mountain vista views. The Pacific Crest National Scenic Trail crosses Zigzag River, where it also overlaps with the historic Timberline Trail. At this crossing, there is a unique opportunity to get a glimpse of Mt. Hood looking up the Zigzag River drainage. This unique experience, along with the seasonal variations of alpine wildflower blooms makes this area highly memorable. There are some waterfalls in the area, including Zigzag Falls, just above the trail crossing the river. The Forest Plan identified substantial scenic values, including geology contributing to scenic diversity of the river, along with the view up river towards the top of Mt. Hood. The snow brings seasonal variations to the landscape, but this may not be

viewed by many in the winter months. The seasonal wildflowers bring color to the landscape during the summer months.

Finding

The scenic resources in Zigzag River were identified as outstanding based on the evaluation criteria, and therefore the scenery is outstandingly remarkable value for this river. The area has unique and highly memorable views of high alpine mountain views from the river corridor. Zigzag River provides unique views from the Pacific Crest Trail, which are uncommon within the region of comparison. There are indications the area is photographed by the visitors, and the scenic resources are unique for the area.

Geology/Hydrology

Evaluation of Present Situation

The large stratovolcano cone of Mount Hood dominates the watershed. The cone was constructed of relatively recent lava flows and pyroclastic flow deposits on an eroded platform of older volcanic rocks. Mount Hood has undergone considerable glacial erosion. The glaciers that remain high on its flanks are mere remnants of what they once were. Beyond the base of the volcano, the older volcanic rocks form lower elevation ridges and drainages. The Zigzag River drainage begins high up, adjacent to the cone of the volcano, where numerous large-scale debris flows initiate in glacial deposits. The drainage has funneled numerous large lahars from the Timberline and Old Maid eruptive periods that traveled all the way to the Columbia River. Additionally, the river corridor has large rock outcroppings and cliffs along the sides of pools along the river. Due to the steep gradient of the river, several cascades as well as some 10- to 20-foot waterfalls exist along the river.

Finding

Although the river has seen cataclysmic eruptions throughout geologic time, the volcanic processes described above can be found throughout the region of comparison, and are considered relatively common. Opportunities to view “textbook” geologic examples do not readily present themselves. Because these features are not unique within the region of comparison, geology does not represent an outstandingly remarkable value.

Fisheries

Evaluation of Present Situation

The Zigzag River has three federal Endangered Species Act-listed threatened fish species that include spring Chinook, coho, and winter steelhead. Anadromous fish habitat ends near RM 10.3 with a series of natural waterfalls with heights of 5 to 100 feet (USDA Forest Service 1991). Thus only the lower mile of the wild and scenic river segment is open to anadromy. These anadromous stocks have free range to migrate to the ocean and return to its spawning grounds since 2007 when the Marmot Dam was removed downstream on the Sandy River. Resident fish, consisting of coastal cutthroat and rainbow trout, do persist at low abundances above this first waterfall. Mountain whitefish, dace species, and sculpin species do occur in the Zigzag River as well and likely in the wild and scenic segment (USDA Forest Service 1995). The diversity of fish species in the Zigzag is similar other headwater streams on Mt. Hood.

The lower reaches of the Zigzag (river mile 9.1 to 11.3), the valley form is a narrow, V-shaped canyon and bedrock substrate is dominant. Upstream of river mile 11.3, the gradient increases with numerous falls and chutes. The river above river mile 13.3 is nearly inaccessible due to a 100-foot falls surrounded by greater than 60 percent side slopes (USDA Forest Service 1991). Glacial “flour” and siltation is common

in this reach and riparian vegetation over-story quickly changes from a western hemlock and Douglas-fir dominated over-story to very sparse vegetation by river mile 11.3. Most of the woody debris in the form of small log jams. Root wads and slash were both scarce and future recruitment of large woody debris was estimated to be low in this reach (USDA Forest Service 1991).

Overall, the aquatic habitat quality in terms of the presence, extent, and carrying capacity of spawning areas, rearing areas, and adult habitat in the Zigzag are relatively low quality compared to the lower reaches of the Zigzag River and other Sandy River Tributaries (USDA Forest Service 1995). This lack of habitat is due to the gradient, geology, and glacial influences in this reach of the Zigzag River.

Finding

Due to naturally occurring steep gradient and glacial fines, the fish assemblage, use, and habitat in this Zigzag segment is low quality relative to other rivers in the forest, as well as the region of comparison. Therefore, fisheries are not considered an outstandingly remarkable value for the Zigzag River.

Wildlife

Evaluation of Present Situation

The Zigzag River segment contains fair to low wildlife diversity and habitat, especially the higher elevation areas. The entire segment is in designated wilderness.

No federal threatened species is found in this segment. The lower-most portion of the river segment contains some suitable and dispersal habitat for the federally-listed northern spotted owl. There are two known Forest Service sensitive species within this segment, the harlequin duck and Cope's giant salamander. No formal surveys have occurred and no incidental sightings have been recorded.

A small herd of deer and elk are present, mainly in summer and early fall. Habitat for deer and elk is of low quality. Local elk migrate to the far eastern edge of the forest during the winter.

Finding

The Zigzag River corridor is not considered to be high quality wildlife habitat, nor does it serve as an important wildlife travel corridor, thus wildlife is not considered to be an outstandingly remarkable value.

Historic

Evaluation of Present Situation

This segment includes portions of an eligible site, Timberline Trail. The Timberline Trail crosses the river near the upper end of the segment; however, the trail does not go along the river. Also, the trail is close to the Barlow Road National Historic Trail corridor; however, the Barlow Road is not located within the river corridor. Additionally, there is an old cabin site within this segment, but it is not eligible. No other historic resource exist within the corridor.

Finding

The Zigzag River did not meet the criteria for an outstandingly remarkable value for historic resources because none of the historic resources are river-dependent, nor are they rare, unique or exemplary within the region of comparison.

Prehistoric

Evaluation of Present Situation

There is evidence of traditional use throughout the corridor with the identification of numerous eligible prehistoric sites. There are several documented traditional use areas along the Zigzag River segment. This area was a travel corridor that closely paralleled the river. The close proximity to water made this a hospitable travel route and use area for local tribes.

Finding

There is confidential prehistoric information that cannot be disclosed that is relevant to evaluating rivers for this value. No sites within this river corridor have rare or unique characteristics within the region of comparison. As such, prehistoric is not an outstandingly remarkable value.

Macoinvertebrates (Other Value)

Evaluation of Present Situation

Scott's apatanian caddisfly (*Allomyia scotti*) is a glacial relict species with a patchy distribution only recorded around Mt. Hood, Oregon; this species is endemic to Mt. Hood National Forest. This species was first collected in 1964 in the West Fork Salmon River (Wiggins 1973). From 2013 to 2016, an exhaustive survey was conducted around Mt. Hood from 3,157 to 6,257 feet elevation for larval Scott's apatanian caddisfly (Wanner and Arendt 2015; Wanner 2018). Seven new populations of Scott's apatanian caddisfly were recorded in Little Zigzag River, Sand Canyon Creek, Camp Creek, Still Creek, West Fork Salmon River, South Fork Iron Creek, a tributary to the Muddy Fork of the Sandy River, a tributary to McGee Creek, and in a tributary to the East Fork Hood River. No Scott's apatanian caddisfly were recorded within the Zigzag River; however, only one site was sampled during that recent survey due to the remote and steep terrain. Therefore, this rare species may exist within the designated segment of the Zigzag River.

The designated segment of the Zigzag River is within one mile of Scott's apatanian caddisfly populations in the Little Zigzag River. This species has patchy distributions from 3,494 to 4,738 feet elevation associated with spring and seeps that feed the Little Zigzag River. It is likely that some of the springs that feed the Zigzag River at these elevations do harbor Scott's apatanian caddisfly populations. Further studies should investigate perennial seeps and springs with stable hydrographs within the designated segment of the Zigzag River.

Finding

Habitat for the Scott's apatanian caddisfly is present in the designated segment of the Zigzag River, including springs and seeps within the known elevation range of this species. Due to the rarity of this species that is only endemic to Mt. Hood, the presence of Scott's apatanian caddisfly in the Zigzag River is an outstandingly remarkable value.

Summary of the Outstandingly Remarkable Values

The following table summarizes the outstandingly remarkable values for the Collawash River, Eagle Creek, East Fork Hood River, Fifteenmile Creek, Fish Creek, Middle Fork Hood River, South Fork Clackamas River, South Fork Roaring River, and Zigzag River.

Table 4. Summary of Outstandingly Remarkable Values for All River Segments

River Segments	Scenery	Recreation	Wildlife	Fish	Geologic/ Hydrologic	Prehistoric	Historic	Other Values
Collawash River Segment 1	No	Yes	No	Yes	Yes	No	No	Botany
Collawash River Segment 2	No	No	No	Yes	Yes	No	No	None
Eagle Creek	No	Yes	No	No	No	No	No	Botany
East Fork Hood River	No	Yes	Yes	No	No	No	No	Botany
Fifteenmile Creek Segment 1	No	No	Yes	No	No	No	Yes	None
Fifteenmile Creek Segment 2	No	Yes	Yes	No	No	No	No	None
Fifteenmile Creek Segment 3	No	Yes	Yes	Yes	No	No	No	None
Fifteenmile Creek Segment 4	No	No	Yes	Yes	No	No	No	None
Fish Creek	No	No	No	Yes	No	No	No	None
Middle Fork Hood River	Yes	No	No	Yes	Yes	No	No	None
South Fork Clackamas River	Yes	No	No	No	No	No	Yes	None
South Fork Roaring River	No	No	No	No	No	No	No	Botany
Zigzag River	Yes	Yes	No	No	No	No	No	Macroinverts

Government Involvement

Tribal Consultation

Following our River Value Workshop in December 2017, several Mt. Hood National Forest staff met with staff members of both the Confederated Tribes of Warm Springs and the Confederated Tribes of Grand Ronde to review initial draft outstandingly remarkable values. During these meetings, the process for the development of the comprehensive river management plan was explained as well as an overview of the proposed outstandingly remarkable values. Concerns were identified relating to:

- A request to not highlight river segments with prehistoric and/or ethnographic values and/or features.
- A request to monitor all sites that are near areas where human impact (e.g., dispersed camping) has or could adversely affect the integrity of a prehistoric and/or ethnographic site or area of tribal significance.

Bureau of Land Management Coordination

The Bureau of Land Management manages lands within the interim corridor of the South Fork Clackamas River. Bureau of Land Management also manages lands adjacent to or near the Fifteenmile Creek, Eagle Creek, and Fish Creek interim corridors. Beginning in February 2018, Mt. Hood National Forest began conversations with the Bureau of Management on the ongoing wild and scenic river planning. The Bureau of Land Management is cooperating with the Forest Service in the development of the comprehensive river management plan. Wade Judy of the Northwest Oregon District will serve as the point of contact to coordinate Bureau of Land Management participation in the planning process and review of products including the River Value Report.

Oregon Parks and Recreation Department Coordination

The Scenic Waterways Act was created to strike a balance between protecting the natural resources, scenic value, and recreational uses of Oregon's rivers by designating them. The state program, which is administered by Oregon Parks and Recreation Department, currently includes approximately 1,200 miles on 22 waterways. This system includes the South Fork Clackamas River (4.2 miles). The Forest Service has discussed this river management planning process with the Clackamas River State Scenic Waterway administer from Oregon Parks and Recreation Department. The administer has reviewed the information regarding South Fork Clackamas River, and will continue to remain engaged throughout the process to ensure that we are meeting the goals of the State program as well as the Wild and Scenic River Act.

Public Involvement

The preliminary draft of the River Values Report was released for public comment in September 2018. The letter sharing the availability of the report and additional information was sent to approximately 340 individuals and organizations, and posted on the [project website](#). In addition, interactive maps and photo tours of each river corridor can be found on the [story map](#) developed as part of this planning process. Through these efforts, we asked for input on the following questions.

- Are there additional river-related natural, cultural, and recreational resources that are rare, unique or exemplary within these river corridors?
- What observations or concerns do you have about the current conditions within these river corridors that may be impacting these river values?

We received 15 comments from individuals and organizations. The organizations included: Middle Fork Irrigation District, Northwest Rafting Company and ECHO River Trips, Mt. Hood Forest Study Group, American Whitewater, Oregon Wild, Oregon Equestrian Trails, Oregon Department of Water Quality, Bark, and U.S. Fish and Wildlife Service, along with three individuals.

All comments were considered by the interdisciplinary teams. Suggestions for changes or additions to the outstandingly remarkable values were evaluated using the same evaluation process and criteria outlined at the beginning of this report (see the Evaluation Process and Criteria section). As a result, we altered the outstandingly remarkable values on the Collawash River and East Fork Hood River. Geology and recreation were added as outstandingly remarkable values on Segment 1 on the Collawash River, and botany was removed as an outstandingly remarkable value for Segment 2 (see the Collawash River, Outstandingly Remarkable Values section for more details). Then, recreation was added as an outstandingly remarkable value for East Fork Hood River (see the East Fork Hood River, Outstandingly

Remarkable Values section for more details). Additional corrections and changes were made throughout the report in response to comments.

Interdisciplinary Team Members

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Chuti Fiedler, Fisheries and Wildlife Biologist

David Lebo, Botanist

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Michelle Lombardo, NEPA Coordinator

Nicole Hill, Landscape Architect

Ryan Cole, Geologist

Todd Reinwald, Hydrologist and Soils Scientist



Figure 20. Interdisciplinary team members at river values workshop

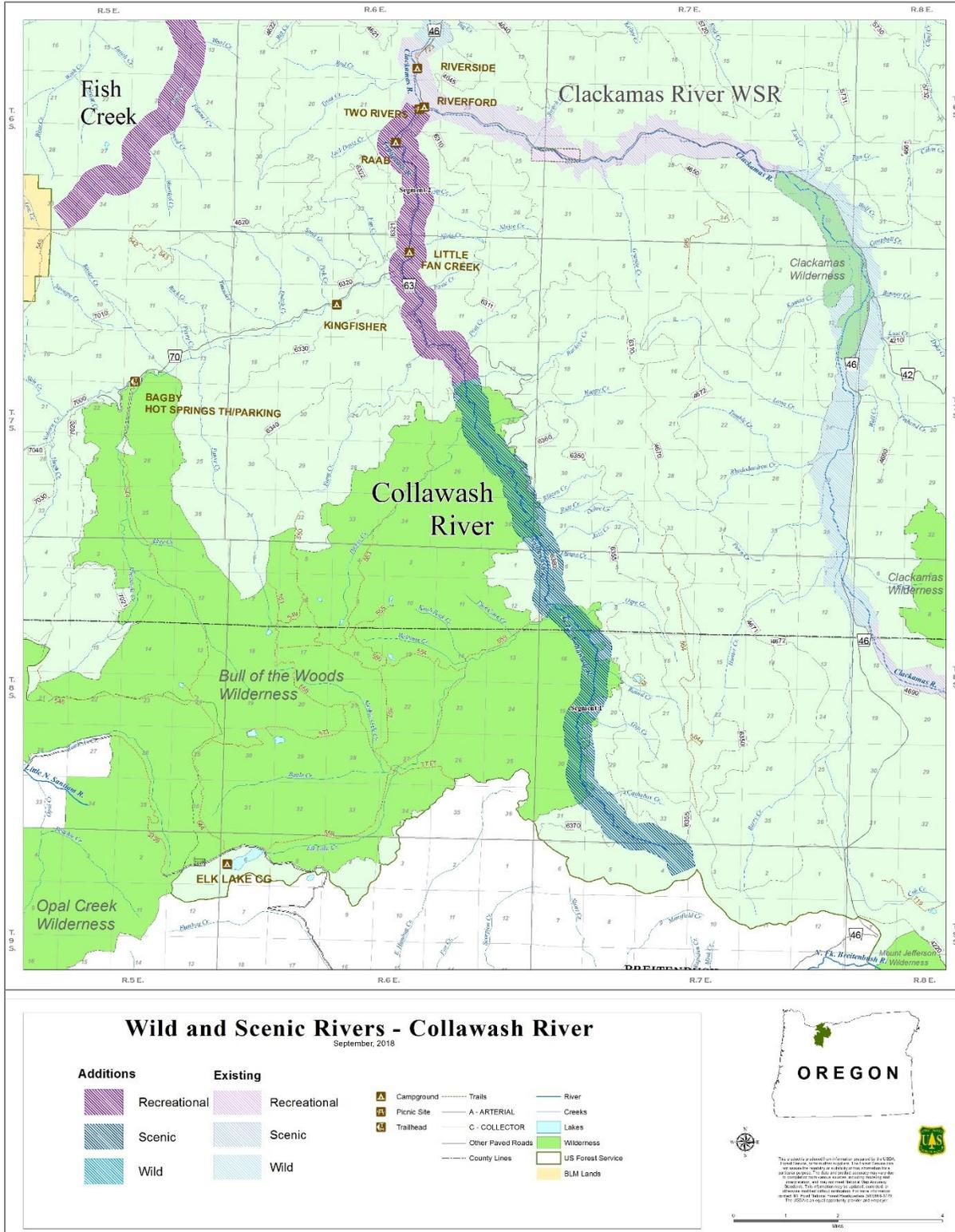
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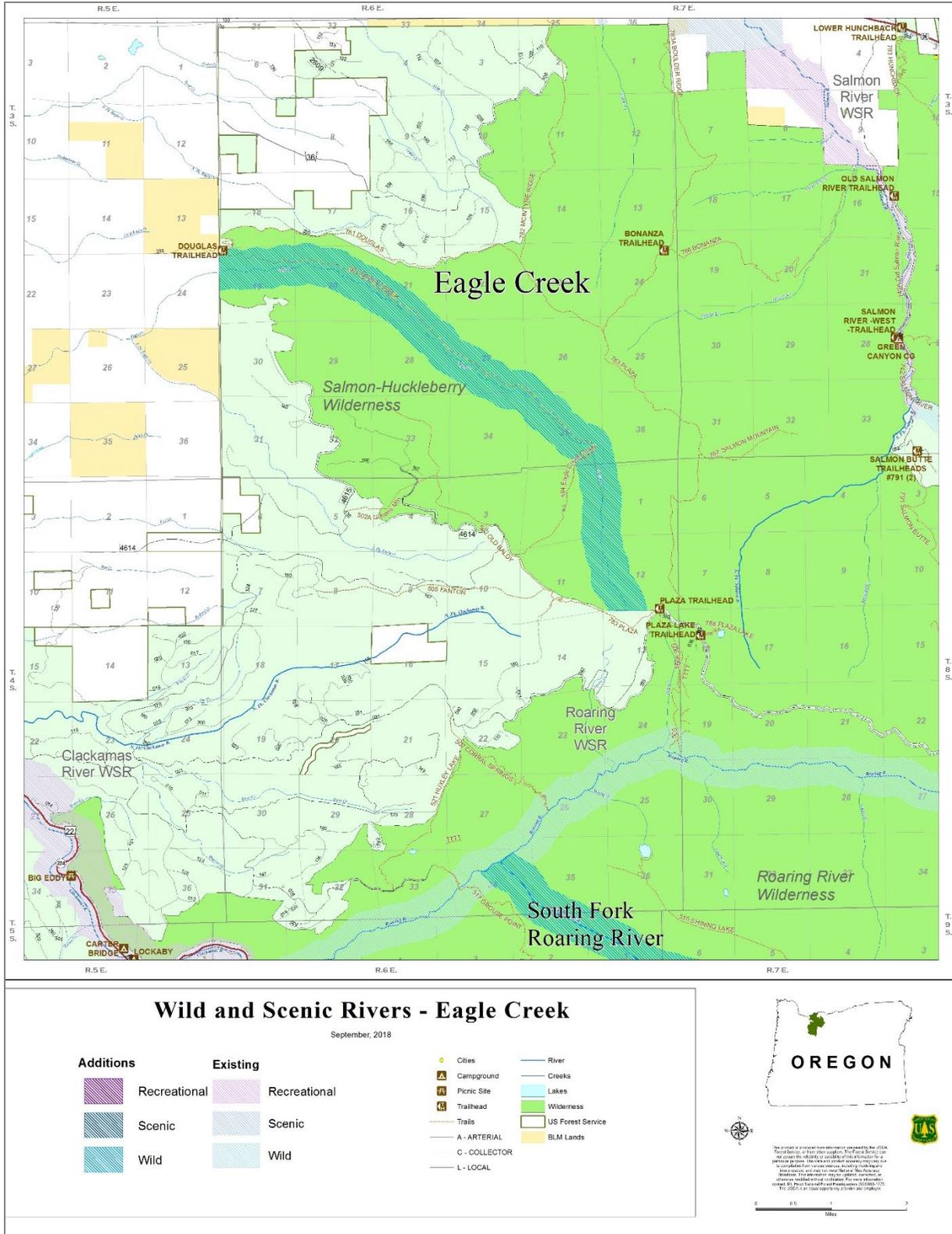
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Maps of River Segments



Map 2. Collawash River, Wild and Scenic River Segments



Map 3. Eagle Creek Wild and Scenic River Segment



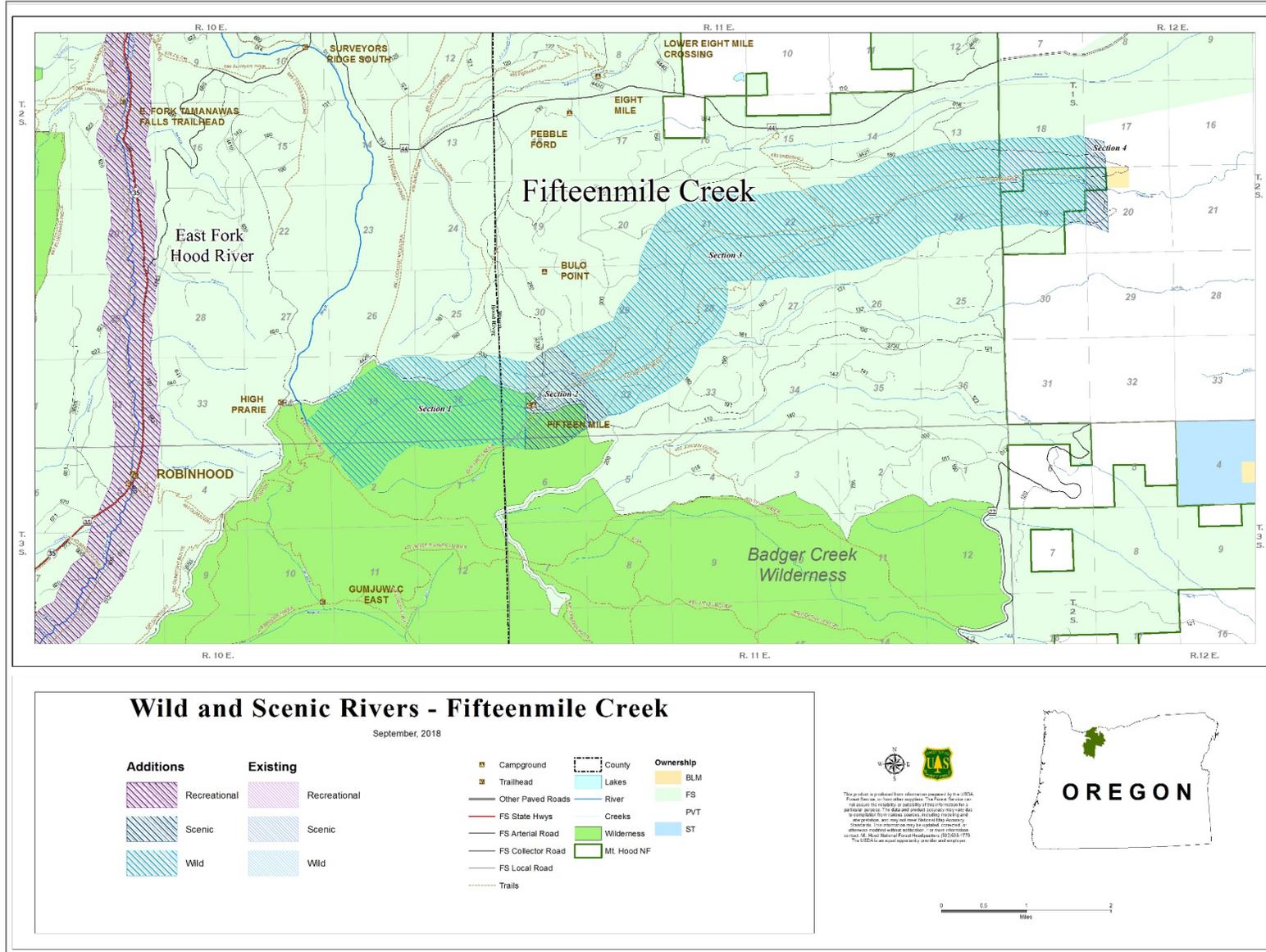
Wild and Scenic Rivers - East Fork Hood River
September, 2018

Additions	Existing	Campground	Lakes
Recreational	Recreational	Trailhead	River
Scenic	Scenic	Trails	Creeks
Wild	Wild	FS State Hwy	Wilderness
		A - ARTERIAL	Mt. Hood National Forest
		C - COLLECTOR	
		County Lines	

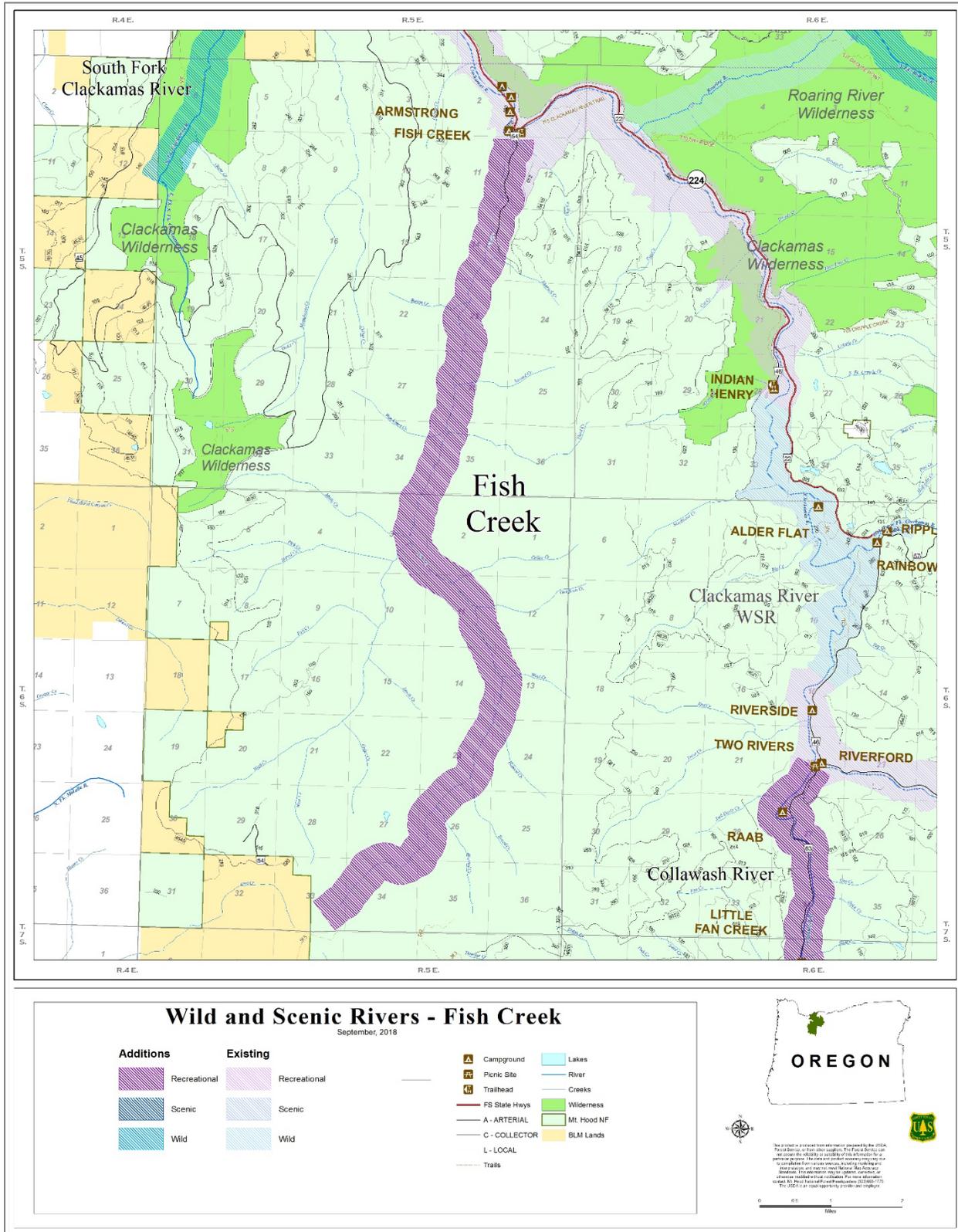
OREGON

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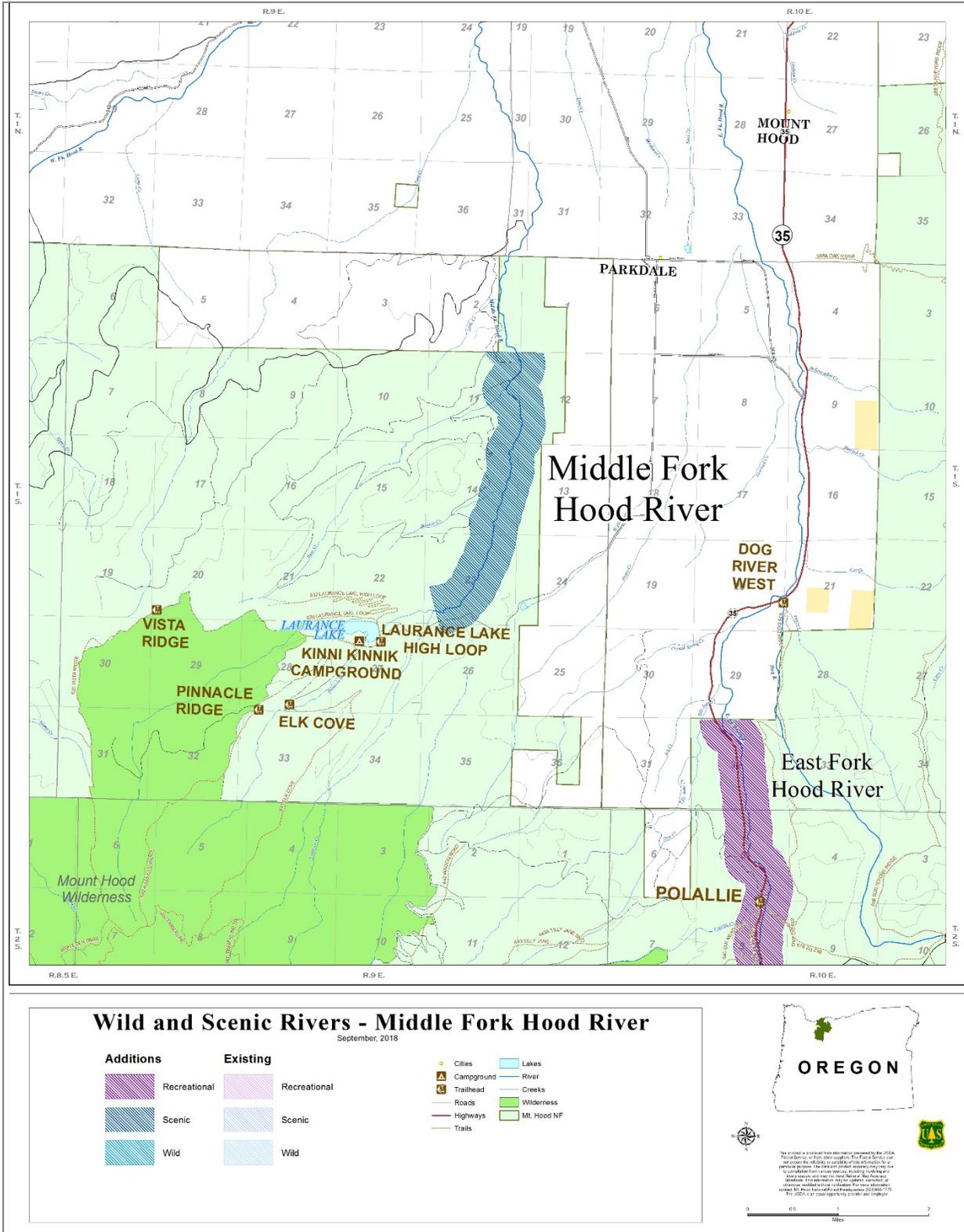
Map 4. East Fork Hood River, Wild and Scenic River Segment



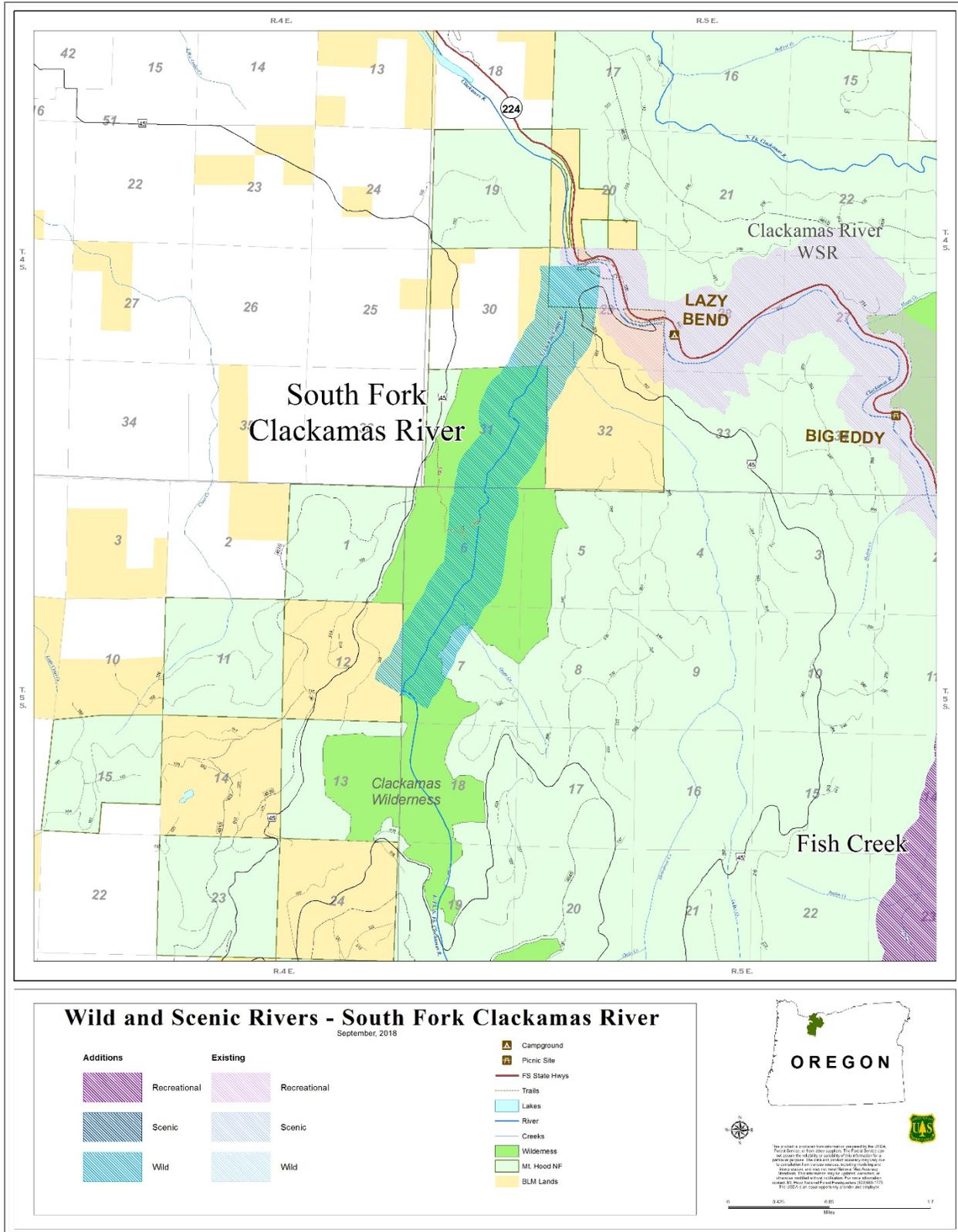
Map 5. Fifteenmile Creek, Wild and Scenic River Segment



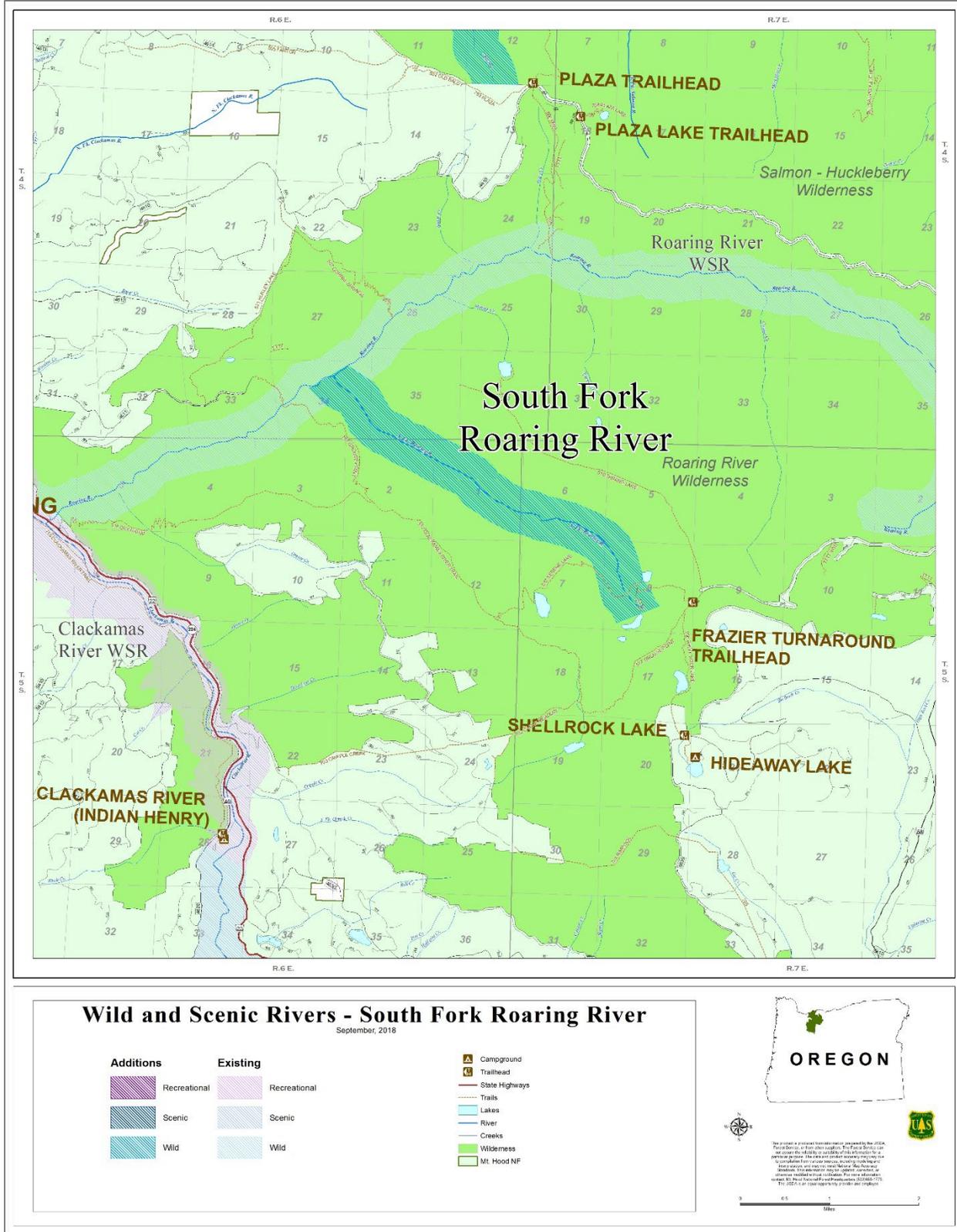
Map 6. Fish Creek, Wild and Scenic River Segment



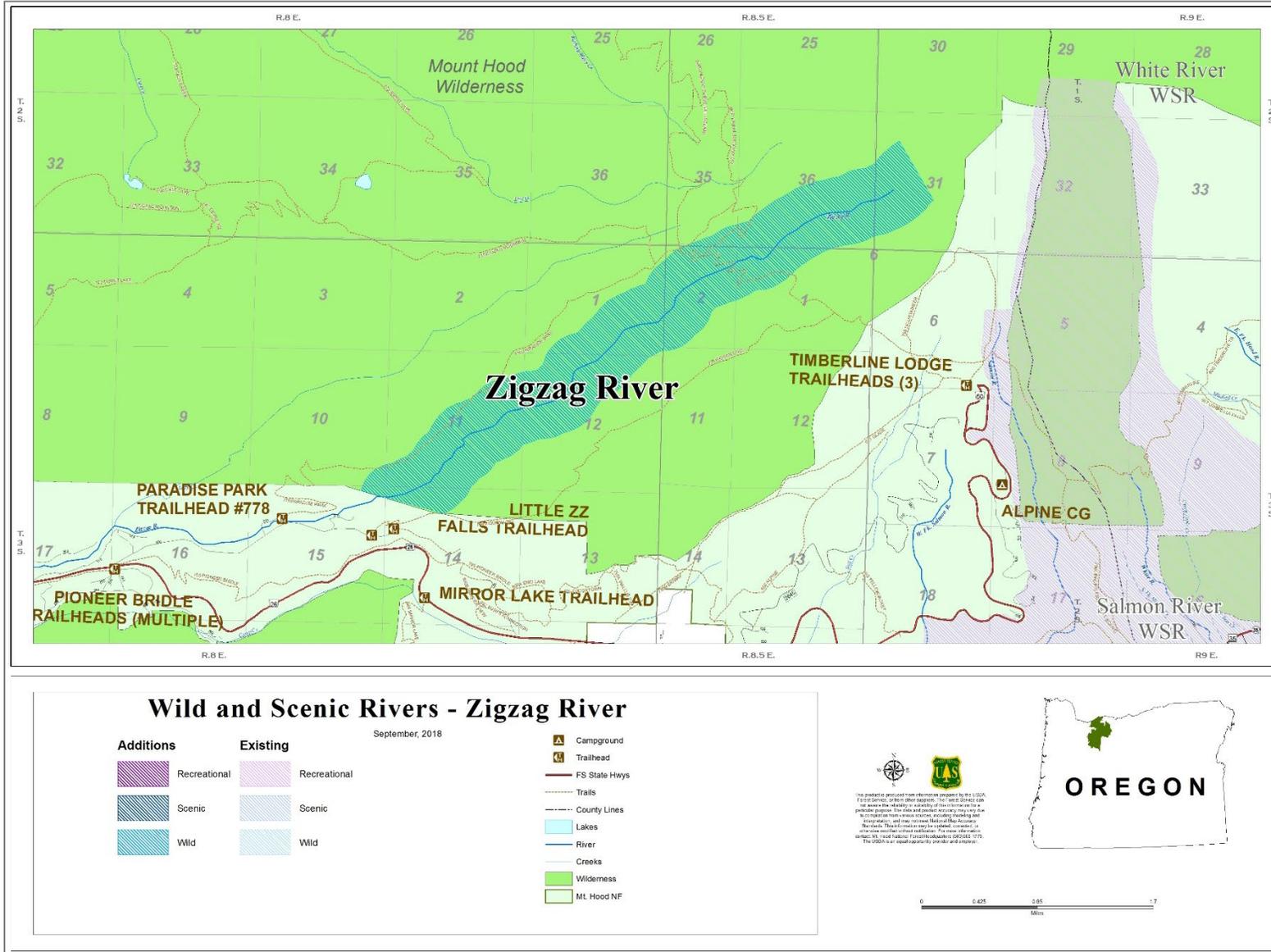
Map 7. Middle Fork Hood River, Wild and Scenic River Segment



Map 8. South Fork Clackamas River, Wild and Scenic River Segment



Map 9. South Fork Roaring River, Wild and Scenic River Segment



Map 10. Zigzag River, Wild and Scenic River Segment