Draft Assessment
Forest Plan Revision

Species at Risk

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for:
Malheur, Umatilla, and Wallowa-Whitman National Forests

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Species at Risk

Introduction

This assessment identifies and evaluates existing information relevant to the plan area for two categories of species at risk, those federally listed as threatened, endangered, proposed or candidate species under the Endangered Species Act, as well as potential species of conservation concern (2012 Planning Rule, 36 CFR 219.6(b) and 36 CFR 219.9). The Forest Service has a legal requirement to proactively work toward the conservation of species listed as threatened or endangered and those which are proposed to be listed. The National Forest Land Management Planning Final Rule and Record of Decision, 36 CFR 219 2012, known as the 2012 Planning Rule, calls for identification of Species of Conservation Concern (SCC) and consideration of them in developing forest plans to help maintain native plant and animal diversity in the plan area. These are species that the Regional Forester has determined that the best available scientific information indicates substantial concern about the species capability to persist over the long term in the plan area (36 CFR 219.9).

The continual goal is to manage national forest system wildlife habitat in a manner that makes special protection measures under the Endangered Species Act (ESA) unnecessary. Most of the species at risk are expected to be maintained by forest plans that provide for high ecosystem integrity and diversity. However, some species may require additional plan components to provide for their persistence or recovery.

The 2012 Planning Rule recognizes that it may not be possible to maintain a viable population of some species within the plan area due to circumstances beyond the authority of the Forest Service or due to limitations in the inherent capability of the land. Examples include migratory species where viability is primarily affected in other locations, temperature sensitive species affected by warming temperatures (see Climate Change Report), or where the plan area has limited ecological capacity to provide sufficient habitat to sustain the species.

Process and Methods

The species addressed in the plan area that are listed under the Endangered Species Act were obtained from the Final Region 6 Regional Forester and Oregon Washington State Director Special Status Species List (June 21, 2021) and United States Fish and Wildlife Service Information for Planning and Consultation webpage (https://ipacb.ecosphere.fws.gov/). Local knowledge about presence of each species on each forest was considered.

The potential species of conservation concern (SCC) list is the responsibility of the Regional Forester as directed in the 2012 Planning Rule. The potential SCC list was developed in accordance with Forest Service Handbook 1909.12. Fish, wildlife, invertebrates, and plant species known to occur on the Malheur, Umatilla, and Wallowa-Whitman National Forests were evaluated relative to categories directed and defined by the 2012 Planning Rule. The process used in developing the potential SCC is

documented in a process paper that will be available online in February 2024. Blue Mountains national forests SCC will not be final until after the NEPA phase of plan revision.

This assessment is based on the best available scientific information, gleaned from published literature, survey and monitoring data, and existing agency reports. Portions of this report utilized the 2018 Blue Mountains Plan Revision Final Environmental Impact Statement to the extent practicable. Current and up to date research, monitoring, and information has been used where appropriate. Geographic Information System (GIS) technology was used where appropriate and available to assess wildlife presence as well as habitat distribution on each forest.

A variety of spatial scales were considered, ranging from individual sites to sub-watersheds to areas as large as populations. For some species, recovery plans are in place that provide recommendations necessary for recovery at various scales. Such recovery plans identify threats to listed species and designated critical habitats at various scales, along with high priority actions to address them. Critical habitat is defined as the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section four of the ESA, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (III) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section four of the ESA, upon a determination by the Secretary that such areas are essential for the conservation of the species (16 U.S.C. Section 1532).

Federally Listed Threatened, Endangered, Proposed and Candidate Species

There are twelve federally listed species under the Endangered Species Act in the Blue Mountains national forests. These include five threatened fish populations, one endangered fish population, three threatened plants, one endangered mammal, one threatened mammal, and one candidate invertebrate (Table 1).

Table 1. Federally Recognized Threatened, Endangered, Proposed, and Candidate Species and the forests they occur on.

Species Name	Federal Listing Status	Forest(s)
Bull trout (*Salvelinus confluentus*)	Threatened	Malheur, Umatilla, Wallowa-Whitman
Chinook salmon (*Oncorhynchus tshawytscha*) Snake River spring and summer runs	Threatened	Umatilla, Wallowa-Whitman
Chinook salmon (*Oncorhynchus tshawytscha*) Snake River fall run	Threatened	downstream influence from Umatilla, Wallowa-Whitman
Snake River steelhead (*Oncorhynchus mykiss*)	Threatened	Umatilla, Wallowa-Whitman
Middle Columbia River steelhead (*Oncorhynchus mykiss*)	Threatened	Malheur, Umatilla, downstream influence from Wallow-Whitman

Species Name	Federal Listing Status	Forest(s)
Snake River Sockeye salmon (*Oncorhynchus nerka*)	Endangered	Wallowa-Whitman
Gray wolf (*Canis lupus*)	Endangered	Malheur, Umatilla west of Highway 395
Wolverine (*Gulo gulo*)	Threatened	Malheur, Umatilla, Wallowa-Whitman
MacFarlane's four o'clock (*Mirabilis macfarlanei*)	Threatened	Wallowa-Whitman
Spalding's catchfly (*Silene spaldingii*)	Threatened	Umatilla, Wallowa-Whitman
Whitebark pine (*Pinus albicaulis*)	Threatened	Malheur, Umatilla, Wallowa-Whitman
Monarch butterfly (*Danaus plexippus*)	Candidate	Malheur, Umatilla, Wallowa-Whitman

Current Forest Plan Direction

The current 1990 forest plans include responsibilities for federally listed ESA and Forest Service sensitive species. Bald eagle (*Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus*) were included in the forest plans and federally listed at that time. Both species have since been delisted but remain protected under the Migratory Bird Treaty Act. Bald eagles are also protected under the Bald and Golden Eagle Protection Act. Specific project design criteria or mitigation measures to meet legal requirements for listed species are identified during project level planning and implementation.

All three 1990 forest plans were amended by interim strategies to protect anadromous and non-anadromous fish-producing watersheds. This was in response to the federal listing of several anadromous and resident fish species in the Snake River and interior portions of the Columbia River basin (PACFISH/INFISH) (USDA 1995; USDA and USDI 1995). The strategies included measures intended to halt further degradation of these species' habitats on federal lands, summarized below:

- Designating riparian habitat conservation areas, managed for the benefit of aquatic and riparian-dependent species. Designated areas call for increasing the width from 100 feet for all water features to at least 150 feet for non-fish bearing perennial streams and lakes, and at least 300 feet for fish bearing streams.
- Identifying and increasing protection of watersheds supporting listed species in good condition or ones that could be restored.
- Standards and guidelines intended to modify or limit adverse effects of land management activities.
- Monitoring.

Subsequent biological opinions by the National Marine Fisheries Service and US Fish and Wildlife Service specified additional requirements for protecting and restoring aquatic and riparian habitats in

National Forest System lands. Requirements include developing and implementing an area-wide monitoring strategy (USDA 2004) to track the effects of implementing the two strategies, and the development of a regionwide watershed and aquatic restoration strategy (latest version; USDA 2018).

Bull Trout

Existing Condition

In 1999, the U.S. Fish and Wildlife Service (USFWS) listed all bull trout (*Salvelinus confluentus*) (Figure 1) populations as threatened (USFWS 1999). Factors which led to the listing of bull trout included poor water quality, non-native species, incidental angler harvest, being pulled through water diversion devices, and habitat fragmentation and degradation associated with road construction, dewatering, grazing, and blockage of migratory paths by dams or diversion structures (USFWS 1999).

Figure 1. Bull Trout; photo credit: R. Tabor, USFWS

Bull trout are both migratory and resident within the plan revision area. Migratory bull trout move between their natal streams and larger bodies of freshwater, such as lakes, reservoirs, and mainstem rivers. They can grow much larger than resident individuals that remain in small colder, high-elevation headwaters as adults. Most of the populations associated with Blue Mountains national forests are migratory, but some resident populations have been isolated and are very small due to historic land use impacts and warming water temperature barriers. The Blue Mountains national forests are within the Upper Snake River and Mid-Columbia Recovery Units for bull trout (USFWS 2015). The recovery plan outlines three recovery goals: 1) bull trout will be geographically widespread across representative habitats and demographically stable; 2) the genetic diversity and diverse life history

forms of bull trout will be generally conserved; and 3) cold water habitats essential to bull trout will be conserved and connected.

Critical habitat for bull trout is present on all three Blue Mountains national forests (Figure 2).

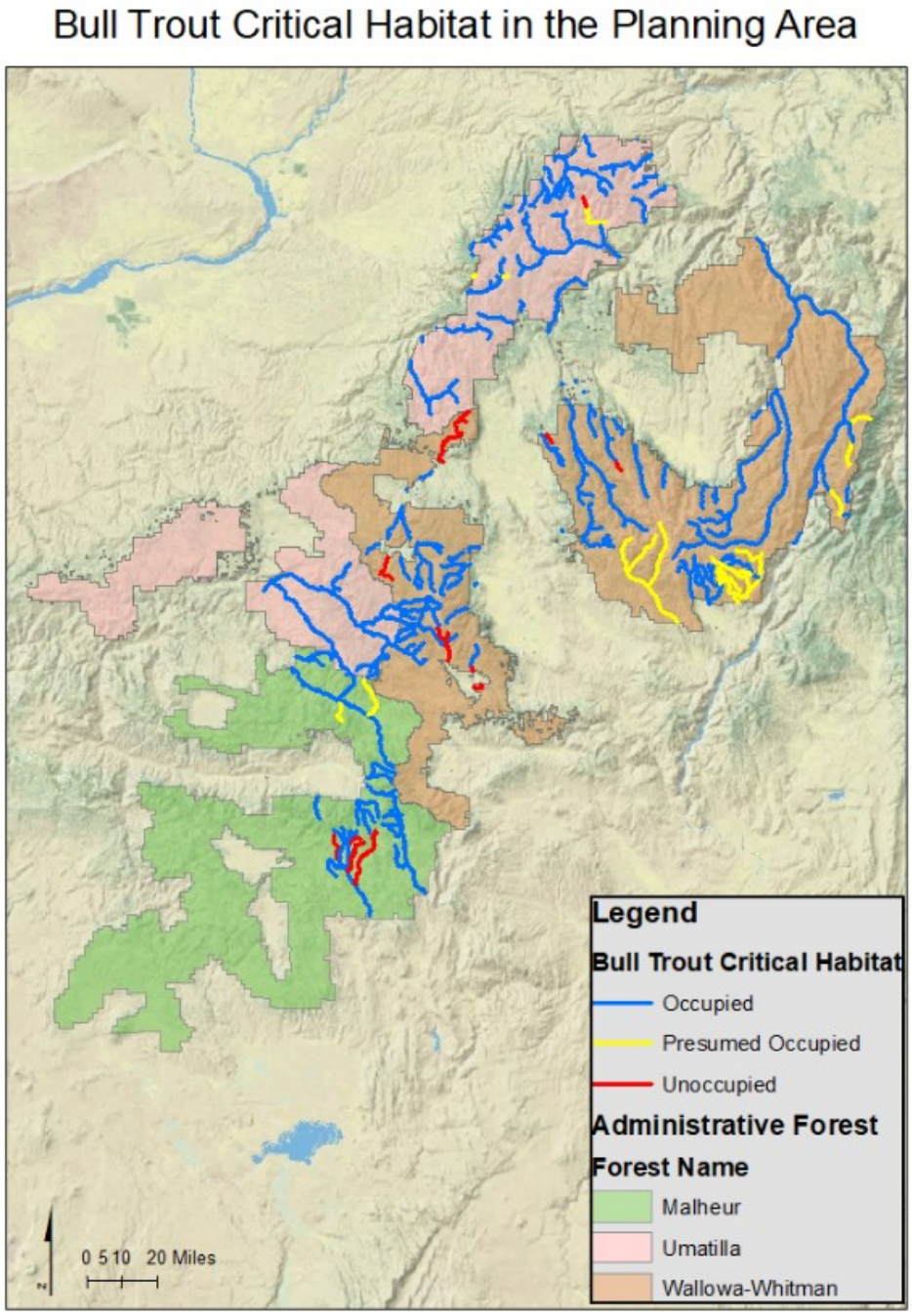

Figure 2. Bull trout critical habitat in the planning area.

Malheur National Forest

Bull trout critical habitat known and presumed occupancy on the Malheur is 81 percent and 6 percent, respectively (Table 2). Thirteen percent of bull trout critical habitat on the Malheur National Forest is unoccupied. The unoccupied critical habitat streams are Corral Basin Creek, McCoy Creek, Bosenberg Creek, and Summit Creek.

Table 2. Bull trout critical habitat amount and occupancy in the planning area.

National Forest	Miles	Known Occupancy	Presumed Occupancy	total
Malheur	246	81 %	6 %	87 %
Umatilla	382	97 %	2.6 %	99.6 %
Wallowa-Whitman	791	79 %	15 %	94 %

The U.S. Fish and Wildlife Service has identified four populations of bull trout in three subbasins associated with the Malheur National Forest. Within these three subbasins, most bull trout spawning and rearing habitat occurs on National Forest System lands. Bull trout spawning and rearing habitat in National Forest System lands is in fair condition based on riparian condition ratings from the Sustainability Model, but provide poor within-subbasin connectivity, based on locations of culverts at road crossings relative to current bull trout distribution (Table 3).

Table 3. Existing condition of bull trout habitat in the planning area.

Forest and Subbasin	Core Area	Spawning and Rearing Habitat (NFS lands)	Condition / Connectivity
Malheur National Forest			
Upper Malheur	Upper Malheur	34 miles	Fair / Poor
Upper Malheur	North Fork Malheur	42 miles	Fair / Poor
Upper John Day	Upper John Day	25 miles	Fair / Poor
Middle Fork John Day	Middle Fork John Day	19 miles	Fair / Poor
Umatilla National Forest			
Asotin	Asotin	8 miles	Fair / Good
Tucannon	Tucannon	27 miles	Fair / Good
Lower Grande Ronde Upper Grande Ronde	Lookingglass-Wenaha	68 miles	Fair / Fair
North Fork John Day	North Fork John Day	42 miles	Fair / Fair
Umatilla	Umatilla	11 miles	Fair / Good
Walla Walla	Walla Walla	55 miles	Fair / Good
Walla Walla	Touchet	18 miles	Fair / Good
Wallowa-Whitman National Forest			
Upper Grande Ronde	Catherine and Indian	62 miles	Fair / Fair

Wallowa	Little Minam	12 miles	Fair / Good
Wallowa	Wallowa/Minam	80 miles	Fair / Good
North Fork John Day	North Fork John Day	32 miles	Fair / Poor
Imnaha	Imnaha	76 miles	Fair / Good
Brownlee	Pine, Indian, and Wildhorse	33 miles	Fair / Fair
Powder	Powder (excludes Eagle)	21 miles	Poor / Poor

Bull trout population data for the Oregon portion of the Mid-Columbia recovery unit has not been collected consistently or extensively and a monitoring strategy for the Mid-Columbia recovery unit was only developed in 2018 (Sankovich 2023) so current trend is unknown. The 2008 status and trend assessments by U.S. Fish and Wildlife Service for these bull trout populations indicate either increasing or decreasing trend on the Malheur National Forest, depending on core population (USFWS 2008). Two dams, Beulah and Warm Springs Reservoirs, downstream of National Forest System land create impassible barriers that isolate both populations in the Upper Malheur River subbasin from all other populations. Prior to the dams, they were likely a larger subbasin-scale population connected via the main Malheur River downstream of both dams.

The Pacific Anadromous Fish Strategy, known as PacFish, and the Inland Native Fish Strategy, known as InFish, hereafter referred to as PacFish-InFish, Biological Opinion Monitoring of streams provides trend data, since 2001, on National Forest System lands. Monitoring indicates that aquatic habitat across the Malheur National Forest is significantly departed from reference streams in the ecoregion (Saunders et al. 2023a). Overall trend is stable, with three indicators improving, three worsening, and two stable. See the Aquatic, Wetland, and Riparian Report for more detail.

Bull trout populations are either very small, declining, or both and the overall stream monitoring results (Saunders et al. 2023a) indicate the need for faster fish habitat recovery within National Forest System lands, including improved within-population connectivity to reduce genetic drift and increase the probability of recolonization following localized extirpations (Table 3).

PacFish-InFish monitoring also helps to determine fish habitat trends on National Forest System lands at the subbasin scale. The Middle Fork John Day is departed from reference streams but shows an insignificant decline, while the Upper Malheur is also departed but with a stable trend (Saunders et al. 2023a). The Upper John Day subbasin is departed and shows a significant worsening trend, driven largely by bank angle.

Additional recovery actions on other land ownerships may also be needed to restore viability to bull trout populations on the Malheur. Active watershed restoration is ongoing with partners in the Middle Fork John Day subbasin on both National Forest System lands and lands of other ownership downstream. Entire watershed restoration strategies over the past 15 or more years have addressed

fish passage impairments at forest road crossings incrementally, along with other essential restoration needs (Aquatic, Wetland, and Riparian Report). The Blue Mountains Aquatic and Riparian Conservation Strategy, through informal consultation with U.S. Fish and Wildlife Service, and content from the Bull Trout Recovery Plan were used as best available science for maintaining or restoring bull trout viability on the Malheur National Forest. The Bull Trout Recovery Plan (USFWS 2015) recognizes that not all populations may be recoverable and has developed goals and strategies accordingly.

Active watershed restoration is ongoing with partners in the Middle Fork John Day subbasin on National Forest System lands as well as downstream, a result of implementing focused regional and national whole-watershed restoration strategies over the past ten or more years. Fish passage impairments at Forest road crossings are being redressed incrementally, along with other essential restoration needs.

Umatilla National Forest

Known occupancy of bull trout critical habitat on the Umatilla National Forest is 97 percent, with nearly all the remainder presumed to be occupied (Table 2). Less than one percent of the critical habitat, Trout Creek in Washington, is unoccupied.

The Umatilla National Forest supports seven bull trout populations distributed among seven subbasins (Table 3). Bull trout spawning and rearing habitat within the Umatilla National Forest is in fair condition and exhibits fair to good within-subbasin connectivity. These ratings are based on riparian condition ratings from the Sustainability Model and the location of culverts at forest road crossings relative to current bull trout distribution.

Bull trout population data for the Oregon portion of the Mid-Columbia recovery unit has not been collected consistently or extensively and a monitoring strategy for the Mid-Columbia recovery unit was only developed in 2018 (Sankovich 2023) so current trend is unknown. The 2008 status and trend assessments by U.S. Fish and Wildlife Service for these bull trout populations indicate mostly stable to increasing trend on the Umatilla National Forest, depending on core population. (USFWS 2008).

Between-population connectivity is variable downstream outside national forest system boundaries, and is affected by factors including downstream dams, irrigation withdrawals, and distance between confluences. Based on PacFish-InFish Biological Opinion monitoring at integrator sites across the Umatilla National Forest, three riparian and aquatic fish habitat indicators are worsening, three are improving, and two are stable, with a total index trend of stable (Saunder et al. 2023b). Integrator sites are on federal land and are those which are most sensitive to changes from variable flow and sediment because they are at the lowermost, low gradient (less than three percent) portion, or reach, of the stream. Overall fish habitat on the Umatilla National Forest is significantly departed from reference sites at the ecoregion (Saunders et al. 2023b). Monitoring at integrator sites also helps to determine riparian-aquatic system trends on National Forest System lands at the subbasin scale. In the North Fork John Day subbasin, overall trend is declining. In the Umatilla subbasin, however, overall trend is improving, largely driven by a significant improvement in one indicator, percent of undercut banks.

Monitoring results suggest that bull trout spawning and rearing habitat within the Umatilla National Forest is being maintained and slowly recovering in some subbasins. Natural processes including fish habitat recovery are inherently uncertain and warrants continued monitoring as well as effective implementation of protective habitat management strategies. Given that populations are very small, declining, or both, faster habitat recovery is needed within National Forest System lands. This includes improving within-population connectivity to reduce genetic drift and increasing the probability of recolonization following localized extinctions that may occur due to demographics or major disturbance events. One such as the high severity School Fire in 2005 that killed the local bull trout population in the Cummings Creek sub-watershed of the Tucannon subbasin on the Umatilla National Forest.

Additional recovery actions on other land ownerships may also be needed to restore viability to bull trout populations on the Umatilla. The Blue Mountains Aquatic and Riparian Conservation Strategy, through informal consultation with U.S. Fish and Wildlife Service, and content from the Bull Trout Recovery Plan was used as best available science for maintaining or restoring bull trout viability on the Umatilla National Forest. The Bull Trout Recovery Plan recognizes that not all populations may be recoverable and has developed goals and strategies accordingly.

Active restoration is ongoing with partners on National Forest System and adjacent lands in the North Fork John Day and Tucannon subbasins. These efforts are the result of focused regional and national whole-watershed restoration strategies over the past 15 or more years. Additional habitat restoration benefiting bull trout on National Forest System lands is ongoing with partner support in the Asotin and Umatilla subbasins. Wallowa-Whitman NF

Wallowa-Whitman National Forest

Known and presumed occupancy of bull trout critical habitat on the Wallowa-Whitman National Forest is 79 and 15 percent of streams respectively (Table 2). Unoccupied streams considered critical habitat include Sheep Creek, East Sheep Creek, Five Points Creek, Middle Fork Five Points Creek, Upper Powder River, Mt. Emily Creek, Cracker Creek, Deer Creek, Tie Creek, Fiddlers Hell Creek, Bear Creek, Fruit Creek, and North Fork Indian Creek.

The Wallowa-Whitman National Forest supports seven populations in seven subbasins (Table 3). Overall, spawning, and rearing habitat in National Forest System lands for bull trout is in fair condition, while within-subbasin habitat connectivity ranges from good to poor. These results are based on riparian habitat condition ratings from the Sustainability Model and the location of culvert barriers at National Forest System road crossings relative to current bull trout distributions. Powder River subbasin habitat for bull trout is highly fragmented within the Wallowa-Whitman National Forest due to legacy mining impacts as well as high numbers of barrier culverts at road stream crossings. Connectivity within and between subbasins, is heavily fragmented by irrigation diversions, dams, and reservoirs downstream of National Forest System lands.

Bull trout population data for the Oregon portion of the Mid-Columbia recovery unit has not been collected consistently or extensively and a monitoring strategy for the Mid-Columbia recovery unit

was only developed in 2018 (Sankovich 2023) so current trend is unknown. The 2008 status and trend assessments by U.S. Fish and Wildlife Service for these bull trout populations indicated a mostly stable core population in the northern portion of the Wallowa-Whitman and a very rapidly declining population in the southern portion of the Wallowa-Whitman National Forest (USFWS 2008).

Based on PacFish-InFish Biological Opinion monitoring at integrator sites across the national forest, overall aquatic habitat is departed from reference streams and most riparian and aquatic habitat indicators are worsening (Saunders et al. 2023c). See the Aquatic, Wetland, and Riparian Report for more detail. Monitoring at integrator sites also helps to determine riparian-aquatic condition trends on National Forest System lands at the subbasin scale. Within the Imnaha subbasin, most indicators are trendless, although large wood frequency and vegetative bank stability show significant improvement (Saunders et al. 2023c). In the Upper Grande Ronde subbasin, changes in half the indicators remain non-significant, though two indicators, large wood frequency and residual pool depth are improving. Two indicators of eight revealed measurable deterioration, vegetative bank stability and median substrate particle size (Saunders et al. 2023c).

Monitoring results indicate that bull trout spawning and rearing habitat within the Wallowa-Whitman National Forest is being maintained and slowly recovering in some subbasins and that uncertain habitat recovery through natural processes warrants continued monitoring in others as well as effective implementation of protective habitat management strategies. Faster habitat recovery within National Forest System lands may be needed to ensure that stable bull trout populations remain stable and that habitat for other populations recovers at a rate that helps stabilize and recover declining populations. The 2018 Blue Mountains ARCS has been finalized for the preferred alternative through informal consultation with U.S. Fish and Wildlife Service and content from the Bull Trout Recovery Plan used as best available science for maintaining or restoring bull trout viability on the Wallowa-Whitman National Forest. Active restoration is ongoing with partners on the Upper Grande Ronde and in the North Fork John Day Subbasin on National Forest System lands as well as downstream private lands, benefitting bull trout. Active restoration is also ongoing in the Imnaha and Upper Grande Ronde subbasins, benefitting two other bull trout populations (J. Vacirca, pers. comm.).

Chinook Salmon

Existing Condition

Chinook salmon on the Blue Mountains forests fall under two listed evolutionary significant units (ESUs), the Snake River Spring/Summer Run (Spring Chinook) and the Snake River Fall Run (Fall Chinook). An ESU is the equivalent of a species under Endangered Species Act. Fall Chinook only occur on the Wallowa-Whitman, but the Umatilla National Forest has influence on populations downstream from where forest management activities occur. Spring Chinook occur on both the Umatilla and Wallowa-Whitman National Forests.

Salmon populations are at a fraction of their historical abundance (NMFS 2022a). Factors leading to the listing of Chinook salmon ESUs mostly include things the Blue Mountains National Forests have no

control over such as overfishing, loss of estuarine habitat, hydropower, poor ocean conditions, and hatchery practices (NMFS 2022a). The Blue Mountains National Forests do have influence on freshwater spawning habitat conditions, which was additional listing factor (NMFS 2022a).

Recovery of Chinook salmon ESUs are determined by major population group (MPG) and whether each MPG is meeting minimum criteria (NMFS 2022a). MPGs are based on genetic, environmental, and life history characteristics (NMFS 2022a).

Umatilla National Forest

The Umatilla National Forest provides habitat for multiple spring Chinook salmon evolutionarily significant unit population—one within the Middle Columbia River and one in the Snake River Basin. Overall, spawning and rearing habitat is in fair condition, based on riparian habitat condition ratings from the Sustainability Model. Spawning and rearing habitat is rated good for within-basin connectivity based on locations of culvert barriers at forest road crossings relative to current salmon distribution (Table 4). Previously blocked culverts in the Middle Columbia River and Snake River Basin have been progressively upgraded or removed over the past ten years, freeing instream movement of spring Chinook salmon.

National Marine Fisheries Service's Biological Review Team determined that habitat risks for reintroduced stock were moderate in the Umatilla and Walla Walla subbasins across all lands, which is consistent with fair habitat conditions in National Forest System lands for these populations (Table 4). The North Fork John Day population is the only native population in the Middle Columbia portion of the Umatilla National Forest.

Snake River Basin spring Chinook salmon have very little spawning habitat outside of designated wilderness areas, other than in the mainstem Grande Ronde River and in the Wenaha River tributary to the Grande Ronde River, which are both managed as Wild and Scenic Rivers. The most recent status assessment by the National Marine Fisheries Service (2022a) for Snake River Basin spring/summer Chinook salmon populations associated with the Umatilla National Forest indicate that all populations are at high risk and not viable.

Based on PacFish-InFish Biological Opinion monitoring at integrator sites across the Umatilla National Forest, three riparian and aquatic indicators are worsening, three are improving, and two are stable, with a total index trend of stable (Saunder et al. 2023b). Integrator sites are on federal land and are those which are most sensitive to changes from variable flow and sediment because they are at the lowermost, low gradient (less than three percent) portion, or reach, of the stream. Overall aquatic habitat on the Umatilla National Forest is significantly departed from reference sites at the ecoregion (Saunders et al. 2023b). Monitoring at integrator sites also helps to determine riparian-aquatic habitat trends on National Forest System lands at the subbasin scale. In the North Fork John Day subbasin, overall trend is declining. In the Umatilla subbasin, however, overall trend is improving, largely driven by a significant improvement in one indicator, percent of undercut banks.

Active restoration is ongoing with partners on National Forest System and adjacent lands in the North Fork John Day and Tucannon subbasins. These efforts are the result of focused regional and national

whole-watershed restoration strategies over the past 15 or more years. Additional habitat restoration on National Forest System lands is ongoing with partner support in the Umatilla subbasin. The geographic spread of restoration projects benefits populations of spring Chinook salmon in both the Middle Columbia River and Snake River Basin.

Table 4. Existing condition of spring/summer chinook salmon on the Umatilla National Forest

Subbasin	Major Population Group (MPG)	Core Area (Population Names)	Population Status (all lands) (NMFS 2022a)	Distinct Population Segment	Spawning and Rearing Habitat Miles/Condition-Connectivity (National Forest System lands)
North Fork John Day	John Day River	North Fork John Day	Viable	Middle Columbia River	60 miles/fair-good
Umatilla	not applicable	Umatilla	Reintroduced (non-native stock)	Hatchery/non-native	8 miles/fair-good
Walla Walla	not applicable	Walla Walla	Reintroduced (non-native stock)	Hatchery/non-native	14 miles/fair-good
Tucannon	Lower Snake River	Tucannon	Not viable	Snake River Basin	6 miles/fair-good
Lower Grande Ronde	Grande Ronde River/Imnaha River	Wenaha	Not viable	Snake River Basin	40 miles/fair-good
Designated Critical Habitats	not applicable	Snake River Basin Evolutionary Significant Unit only	not applicable	Snake River Basin	284 miles

Wallowa-Whitman National Forest

Snake River Basin fall Chinook salmon are currently viable and at an overall low risk of extirpation (NMFS 2022b). Their spawning habitat includes:

- The Snake River and the lower ends of large tributaries in Wild and Scenic River management allocations in the Upper and Lower Grande Ronde River subbasins.
- The Imnaha River in the Hells Canyon National Recreation Area downstream of the Plan Area, and well downstream of National Forest System lands in the Tucannon River subbasin.
- Snake River Basin where spring Chinook salmon are found in the Tucannon, Grande Ronde, Wallowa, Imnaha, and Snake River/Hells Canyon subbasins within the Umatilla and Wallowa-Whitman National Forests.

The Wallowa-Whitman National Forest also provides habitat for multiple spring/summer Chinook evolutionarily significant unit populations, one within the Middle Columbia River, and one in the Snake River Basin. Overall, spawning and rearing habitat in National Forest System lands for Snake River Basin spring Chinook salmon is in fair condition based on riparian habitat condition ratings from the Sustainability Model. Most spawning and rearing habitat is rated good for within subbasin connectivity (Table 5). Despite fair to good spawning habitat conditions and connectivity, the Grande Ronde River/Imnaha River MPG is not meeting recovery criteria. Recovery criteria for the Grande

Ronde River/Imnaha River MPG calls for at least four populations in MPG to achieve viable status, with at least one of those being highly viable, and the rest of the populations meeting a maintained status (NMFS 2022a).

Spawning and rearing habitat for Middle Columbia River spring Chinook salmon in the Wallowa-Whitman National Forest is in the headwaters of the North Fork John Day Basin. Most of the spawning and rearing habitat there is in wilderness or a wild and scenic river corridor and is in fair condition with good connectivity. The Middle Columbia River spring/summer Chinook salmon evolutionarily significant unit is considered viable at the all-lands scale.

Based on PacFish-InFish Biological Opinion monitoring at integrator sites across the national forest, overall aquatic habitat is departed from reference streams and most riparian and aquatic indicators are worsening (Saunders et al. 2023c). See the Aquatic, Wetland, and Riparian Report for more detail. Monitoring at integrator sites also helps to determine riparian-aquatic condition trends on National Forest System lands at the subbasin scale. Within the Imnaha subbasin, most indicators are trendless, although large wood frequency and vegetative bank stability show significant improvement (Saunders et al. 2023c). In the Upper Grande Ronde subbasin, changes in half the indicators remain non-significant, though two indicators, large wood frequency and residual pool depth are improving. Two indicators of eight revealed measurable deterioration, vegetative bank stability and median substrate particle size (Saunders et al. 2023c).

Monitoring results indicate that spring Chinook salmon spawning and rearing habitat within the Wallowa-Whitman National Forest is being maintained and slowly recovering in some subbasins. Passive and active restoration projects and efforts have been occurring. An example of passive restoration is resting the pasture during the spawning and rearing period or reducing livestock grazing allowable use measures in pastures that contain occupied spring Chinook spawning and rearing habitat. This has been done in the Imnaha River drainage and a headwater area of the North Fork of the John Day River. The removal or reduction of activities or infrastructure features that have influenced degradation can create conditions for passive recovery through natural processes. These processes include sediment deposition after run-off events followed by riparian vegetation establishment. Habitat recovery through natural processes is inherently uncertain and warrants continued monitoring and effectively implemented protective habitat management strategies. Habitat recovery continues to improve habitat for Middle Columbia River spring Chinook salmon populations.

Active restoration is ongoing with partners in the North Fork John Day subbasin on National Forest System lands as well as downstream, benefitting Middle Columbia River spring Chinook salmon. Restoration is also ongoing in the Imnaha and Upper Grande Ronde subbasins, benefitting two populations of Snake River Basin spring Chinook salmon.

Table 5. Existing condition of spring/summer chinook salmon on the Wallowa-Whitman National Forest

Subbasin	Major Population Group (MPG)	Core Area (Population Names)	Population Status (all lands) (NMFS 2022a)	Distinct Population Segment	Spawning and Rearing Habitat Miles/Condition-Connectivity (National Forest System lands)
North Fork John Day	John Day River	North Fork John Day	Viable	Middle Columbia River	12 miles/good-good
Upper Grande Ronde	Grande Ronde River/Imnaha River	Upper Grande Ronde	Not viable	Snake River Basin	5 miles/fair-fair
Upper Grande Ronde	Grande Ronde River/Imnaha River	Catherine Creek	Not viable	Snake River Basin	19 miles/fair-good
Wallowa	Grande Ronde River/Imnaha River	Lostine/Wallowa	Not viable	Snake River Basin	12 miles/fair-good
Wallowa	Grande Ronde River/Imnaha River	Minam	Maintained	Snake River Basin	46 miles/fair-good
Imnaha	Grande Ronde River/Imnaha River	Imnaha	Not viable	Snake River Basin	41 miles/fair-good
Designated Critical Habitats	not applicable	Snake River Basin Evolutionary Significant Unit only	not applicable	Snake River Basin	1,377 miles

Steelhead

Existing Condition

Steelhead populations, like salmon, are at a fraction of their historical abundance (NMFS 2022c). Factors leading to the listing of steelhead include overfishing, loss of estuarine habitat, hydropower, poor ocean conditions, and hatchery practices (NMFS 2022c), all of which the Blue Mountains forests have no control over. The Blue Mountains National Forests do have influence on freshwater spawning habitat conditions, which was additional listing factor (NMFS 2022c).

Subbasin-scale habitat and population conditions in each national forest are summarized in Tables 6-8 with accompanying narratives for each Forest. The table identifies populations as either belonging to the Middle Columbia River or Snake River Basin distinct population segments. Only the native anadromous (steelhead) forms of *Oncorhynchus mykiss* are listed.

Malheur National Forest

The Malheur National Forest supports four Middle Columbia River steelhead populations in three adjacent subbasins (Table 6). Steelhead spawning and rearing habitat in National Forest System lands is in fair to good condition based on riparian condition ratings from the Sustainability Model. Rearing and spawning habitat was rated fair to poor for within-subbasin connectivity based on location of culverts at forest road crossings relative to steelhead distribution.

PacFish-InFish Biological Opinion Monitoring of streams provides trend data, since 2001, on National Forest System lands. Monitoring indicates that aquatic conditions across the Malheur National Forest are significantly departed from reference streams in the ecoregion (Saunders et al. 2023a). Overall trend is stable, with three indicators improving, three worsening, and two stable. See the Aquatic, Wetland, and Riparian Report for more detail. PacFish-InFish Monitoring also helps to determine riparian-aquatic condition trends on National Forest System lands at the subbasin scale. The Middle Fork John Day is departed from reference streams but shows an insignificant decline, while the Upper Malheur is also departed but with a stable trend (Saunders et al. 2023a). The Upper John Day subbasin is departed and shows a significant worsening trend, driven largely by bank angle.

The North Fork John Day population is currently highly viable, the Middle Fork and South Fork John Day populations are also viable, while the Upper John Day population is meeting maintenance objectives (NMFS 2022c) (Table 6). However, recovery criteria are developed for genetically similar major population groups (MPGs). Therefore, despite one highly viable and two viable populations, the John Day River MPG is not viable because both the Lower and Upper John Day populations remain at a maintained status (NMFS 2022c). The Lower John Day is outside of the Malheur National Forest.

Active watershed restoration is ongoing with partners in the Middle Fork John Day subbasin on National Forest System lands. These efforts are the result of focused regional and national whole-watershed restoration strategies over the past 15 or more years. Fish passage impairments at National Forest road crossings are corrected incrementally, along with other essential restoration needs.

Table 6. Existing condition of summer steelhead on the Malheur National Forest

Subbasin	Major Population Group (MPG)	Core Area (Population Names)	Population Status (all lands) (NMFS 2022c)	Distinct Population Segment	Spawning and Rearing Habitat Miles/Condition-Connectivity (National Forest System lands)
Middle Fork John Day	John Day River	Middle Fork John Day	Viable	Middle Columbia River	171 miles/good-poor
Upper John Day	John Day River	Upper John Day	Maintained	Middle Columbia River	97 miles/fair-fair
Upper John Day	John Day River	South Fork John Day	Viable	Middle Columbia River	70 miles/fair-poor

Subbasin	Major Population Group (MPG)	Core Area (Population Names)	Population Status (all lands) (NMFS 2022c)	Distinct Population Segment	Spawning and Rearing Habitat Miles/Condition-Connectivity (National Forest System lands)
North Fork John Day	John Day River	North Fork John Day	Highly viable	Middle Columbia River	8 miles/fair-good
Designated Critical Habitats	not applicable	Middle Columbia River Distinct Population Segment only	not applicable	Middle Columbia River	410 miles

Umatilla National Forest

The Umatilla National Forest provides habitat for six steelhead populations within the Middle Columbia River distinct population segment and four populations within the Snake River Basin distinct population segment (Table 7). Spawning and rearing habitat in National Forest System lands in both basins is in fair to good condition based on riparian habitat condition ratings from the Sustainability Model. Within-subbasin connectivity for Middle Columbia River steelhead is fair to good, based on location of culverts at forest road crossings relative to Middle Columbia River steelhead distribution. Passage conditions on National Forest System lands are also fair to good throughout the Snake River Basin, based on location of culverts at road crossings relative to Snake River Basin steelhead distribution.

The North Fork and Middle Fork John Day subbasin populations in the Middle Columbia River steelhead distinct population segment are the only populations currently considered viable (NMFS 2022c). The Walla Walla, Umatilla and Lower John Day populations are considered stable or maintained, and the Touchet population is not viable and at high risk of extirpation (NMFS 2022c). Population status in the Snake River Basin varies between subbasins. Two of four populations are currently maintained, and the Upper Grande Ronde steelhead population is viable, but the Lower Grande Ronde population is at high risk for extirpation and non-viable (NMFS 2022d). None of the four steelhead MPGs represented on the Umatilla National Forest are meeting recovery viability criteria (NMFS 2022c, NMFS 2022d).

Based on PacFish-InFish Biological Opinion monitoring at integrator sites across the Umatilla National Forest, three riparian and aquatic habitat indicators are worsening, three are improving, and two are stable, with a total index trend of stable (Saunder et al. 2023b). Overall aquatic habitat on the Umatilla National Forest is significantly departed from reference sites at the ecoregion (Saunders et al. 2023b). Monitoring at integrator sites also helps to determine riparian-aquatic habitat trends on National Forest System lands at the subbasin scale. In the North Fork John Day subbasin, overall trend is declining. In the Umatilla subbasin, however, overall trend is improving, largely driven by a significant improvement in one indicator, percent of undercut banks.

Monitoring results suggest that steelhead spawning and rearing habitat within the Umatilla National Forest is being maintained and slowly recovering in some subbasins. Natural processes including habitat recovery are inherently uncertain and warrants continued monitoring and effectively implemented protective habitat management strategies. Monitoring results indicate that steelhead habitat conditions continue to contribute to restored viability of Middle Columbia River and Snake River Basin steelhead populations on National Forest System lands.

Active restoration is ongoing with partners on National Forest System and adjacent lands in the North Fork John Day and Tucannon subbasins. These partnerships are a result of focused regional and national whole-watershed restoration strategies over the past 15 or more years. Additional habitat restoration on National Forest System lands is ongoing with partner support in the Umatilla subbasin. The geographic distribution of active restoration efforts benefits populations of both Middle Columbia River and Snake River Basin steelhead.

Table 7. Existing condition of summer steelhead on the Umatilla National Forest

Subbasin	Major Population Group (MPG)	Core Area (Population Names)	Population Status (all lands) (NMFS 2022c, 2022d)	Distinct Population Segment	Spawning and Rearing Habitat Miles/Condition-Connectivity (National Forest System lands)
North Fork John Day	John Day River	North Fork John Day	Highly viable	Middle Columbia River	365 miles/fair-fair
Middle Fork John Day	John Day River	Middle Fork John Day	Viable	Middle Columbia River	10 miles/fair-good
Lower John Day	John Day River	Lower John Day	Maintained	Middle Columbia River	8 miles/fair-good
Umatilla	Walla Walla & Umatilla Rivers	Umatilla	Maintained	Middle Columbia River	52 miles/fair-fair
Walla Walla	Walla Walla & Umatilla Rivers	Walla Walla	Maintained	Middle Columbia River	23 miles/good-good
Walla Walla	Walla Walla & Umatilla Rivers	Touchet	Not viable	Middle Columbia River	4 miles/fair-good
Tucannon	Lower Snake River	Tucannon	maintained	Snake River Basin	17 miles/fair-good
Asotin	Lower Snake River	Asotin	Maintained	Snake River Basin	8 miles/fair-good

Subbasin	Major Population Group (MPG)	Core Area (Population Names)	Population Status (all lands) (NMFS 2022c, 2022d)	Distinct Population Segment	Spawning and Rearing Habitat Miles/Condition-Connectivity (National Forest System lands)
Lower Grande Ronde	Grande Ronde River	Lower Grande Ronde	Not viable	Snake River Basin	104 miles/fair-good
Upper Grande Ronde	Grande Ronde River	Upper Grande Ronde	Viable	Snake River Basin	34 miles/good-fair
Designated Critical Habitats	not applicable	Snake River Basin Distinct Population Segment only	not applicable	Snake River Basin	284 miles
Designated Critical Habitats	not applicable	Middle Columbia River Distinct Population Segment only	not applicable	Middle Columbia River	647 miles

Wallowa-Whitman National Forest

The Wallowa-Whitman National Forest provides habitat for one Middle Columbia River steelhead population and six Snake River Basin steelhead populations (Table 8). Spawning and rearing habitat in both basins is in fair to good condition. Within-subbasin connectivity is fair to good based on location of culverts at National Forest System road crossings relative to current steelhead distribution.

The most recent status assessment by National Marine Fisheries Service (2022d) for Snake River Basin steelhead populations associated with the Wallowa-Whitman National Forest indicate that population status varies by subbasin. The Middle Columbia River steelhead population in the North Fork John Day subbasin is highly viable but declining in recent years. This is occurring despite good habitat conditions and fair connectivity within Wallowa-Whitman National Forest System lands. The status of Snake River Basin steelhead populations varies from not viable to viable (Table 8). The Joseph Creek population in the Lower Grande Ronde subbasin, declined from highly viable in the previous five-year review to viable in the 2022 5-Year Review (NMFS 2022d).

Based on PacFish-InFish Biological Opinion monitoring at integrator sites across the national forest, overall aquatic conditions are departed from reference streams and most riparian and aquatic indicators are worsening (Saunders et al. 2023c). See the Aquatic, Wetland, and Riparian Report for more detail. Monitoring at integrator sites also helps to determine riparian-aquatic habitat condition trends on National Forest System lands at the subbasin scale. Within the Imnaha subbasin, most indicators are trendless, although large wood frequency and vegetative bank stability show significant

improvement (Saunders et al. 2023c). In the Upper Grande Ronde subbasin, changes in half the indicators remain non-significant, though two indicators, large wood frequency and residual pool depth are improving. Two indicators of eight revealed measurable deterioration, vegetative bank stability and median substrate particle size (Saunders et al. 2023c).

Monitoring results indicate that steelhead spawning and rearing habitat within the Wallowa-Whitman National Forest is being maintained and slowly recovering in some subbasins. Natural processes including habitat recovery are inherently uncertain and warrants continued monitoring and effectively implemented protective habitat management strategies. Faster habitat recovery within National Forest System lands is needed to ensure that stable steelhead populations remain so, and that habitat for other populations helps stabilize and recover declining populations.

Active restoration is ongoing with partners in the North Fork John Day subbasin on National Forest System lands as well as downstream on private lands, benefitting Middle Columbia River steelhead. Active restoration is also ongoing in the Imnaha and Upper Grande Ronde subbasins (J. Vacirca, pers. comm.), benefitting populations of both Middle Columbia River and Snake River Basin steelhead.

Table 8. Existing condition of summer steelhead on the Wallowa-Whitman National Forest

Subbasin	Major Population Group (MPG)	Core Area (Population Names)	Population Status (all lands) (NMFS 2022c, 2022d)	Distinct Population Segment	Spawning and Rearing Habitat Miles/Condition-Connectivity (NFS lands)
North Fork John Day	John Day River	North Fork John Day	Highly viable	Middle Columbia River	70 miles/good-fair
Asotin	Lower Snake River	Asotin	Maintained	Snake River Basin	3 miles/fair-good
Hells Canyon	Hells Canyon	Hells Canyon	Not viable	Snake River Basin	43 miles/fair-good
Lower Grande Ronde	Grande Ronde River	Joseph	Viable	Snake River Basin	181 miles/fair-fair
Upper Grande Ronde	Grande Ronde River	Upper Grande Ronde	Viable	Snake River Basin	204 miles/good-fair
Wallowa	Grande Ronde River	Wallowa	Not viable	Snake River Basin	86 miles/fair-good
Imnaha	Imnaha River	Imnaha	Viable	Snake River Basin	198 miles/good-good
Designated Critical Habitats	not applicable	Snake River Basin Distinct Population Segment only	not applicable	Snake River Basin	1,377 miles
Designated Critical Habitats	not applicable	Middle Columbia River Distinct Population Segment only	not applicable	Middle Columbia River	76 miles

Sockeye Salmon

Existing Condition

The endangered Snake River sockeye salmon (*Oncorhynchus nerka*), listed in 1991, is present on the Wallowa Whitman NF during migrations through the Snake River in Hells Canyon. Factors collectively contributing to the decline of 28 salmon and steelhead populations in Oregon, Idaho, Washington, and California. Factors include overfishing, loss of freshwater and estuarine habitat, hydropower, poor ocean conditions, and hatchery practices (NMFS 2022e). Although a hatchery program reduces the risk of immediate loss, Snake River sockeye salmon remain at a high risk for extinction within 100 years, when considering natural reproduction (NMFS 2022e).

Sockeye use the mainstem Columbia and Snake Rivers as a migration corridor to reach their spawning areas in Idaho. National Forest System lands within the Plan Area provide no spawning habitat and no early rearing habitat outside the mainstem Snake River. Consultation on sockeye salmon was completed for the Hells Canyon National Recreation Area Comprehensive Management Plan and no revisions to that plan are currently proposed.

Listed Fish Risks, Trends, and Information Needs

Risks and Stressors

Existing stressors to listed fish on the Blue Mountains national forests include physical barriers, such as road culverts, barriers created by high water temperatures or low seasonal flow, and competitive or predatory interaction with nonnative species. The extent to which a passage barrier impacts a specific aquatic species may be at a reach, sub watershed, or subbasin scale. These threats and conditions affecting TEPC fish extend across landownership boundaries. However, opportunities are available, to partner on projects within and across watersheds to increase suitable stream habitat for fish spawning and migration. Viability of Snake River Basin steelhead and Chinook salmon is also influenced by factors outside Forest Service control. Such factors include mortality associated with upstream and downstream passage over multiple mainstem dams in the Snake and Columbia Rivers, cyclical ocean conditions, commercial, tribal and recreational harvest, and interbreeding with nonnative hatchery stock.

Climate change is a compounding stressor that is affecting and is anticipated to continue affecting fish populations, including through warming air temperature, altered snowmelt patterns that are resulting in warmer stream temperatures, changed peak and low flows, and the frequency and magnitudes of events such as floods, droughts, and wildfire (Halofsky and Peterson 2017). For more information, see the Climate Change Assessment Report.

Trends and Drivers

Spawning and rearing habitats (i.e., submerged and overhanging large wood, log jams and beaver dams, side channels, pools, undercut banks or unembedded substrates) for aquatic listed species range from poor (i.e., features are absent) to good condition (i.e., features are present), depending on the subbasin (Tables 3-10). Remaining migratory habitats for aquatic listed species range from poor to

good condition depending on the subbasin with respect to water quality and quantity, and presence or absence of thermal refugia and connectivity. Long-term viability of federally listed aquatic species is dependent, in part, upon availability of sufficient high-quality spawning and rearing habitats within subbasins through time, as well as population and habitat connectivity within and between subbasins to provide for migration.

Information Needs

Bull trout demographic and ecological data for the Oregon portion of the Mid-Columbia recovery unit has not been collected consistently or extensively according to Sankovich (2023). This data gap is important to fill to determine population impact resulting from habitat restoration and other threat reduction efforts across the planning area.

According to the National Marine Fisheries Service (NMFS)(2022a), approximately 53 percent of wild John Day adult steelhead overshoot their natal tributaries when returning to spawn. It is unknown how many can successfully return after overshooting. An evaluation of mechanisms driving this phenomenon is recommended by the NMFS (2022a). More tagging of Columbia River steelhead may also better quantify the probability of a successful correction in return migration.

Wilson et al. (2023) found that climate change is shifting major life cycle events such as migration and that it may vary even across populations of the same species. Although, the Forest Service is unable to control climate change related mismatches in phenology with prey, more information on how migration timing of each listed fish population within the planning area is changing would inform forest management to minimize or avoid negative impact to listed fish and may also help prioritize restoration projects.

Gray Wolf

Figure 3. Gray wolf female from the Minam Pack, photo credit: ODFW

Existing Condition

Absent for many years due to low tolerance by humans, wolves are now present in the Blue Mountains. Gray wolves are native to the area and play an important role in the ecosystem. As an apex species they occupy a top place in the natural food chain. Key habitat components for wolves include year-round prey base of elk, deer, and moose as well as smaller prey, secluded denning and rendezvous sites, and open spaces with minimal exposure to humans.

Gray wolves are listed and managed as an endangered species only where they occur west of Oregon and Washington State Highway 395, therefore listed status applies to 43 percent of the Malheur, and 20 percent of Umatilla, and none of the Wallowa-Whitman. They are not listed as state endangered in Oregon and Washington but are a strategy species for the Blue Mountains in Oregon's Wildlife Conservation Strategy.

Currently there are no official wolf packs west of Highway 395 in the Blue Mountains forests. A pack is defined by the states as four or more wolves traveling together in winter. Wolf packs east of Highway 395 and thus not listed as endangered, are many. Wolves have successfully utilized most of the Umatilla with currently 18 packs, the Wallowa-Whitman with currently 11 packs, and to a much lesser degree the Malheur with only one pack in Logan Valley (Figure 4). The Blue mountains wolf population has steadily grown since 2008 but has slowed down in the past few years.

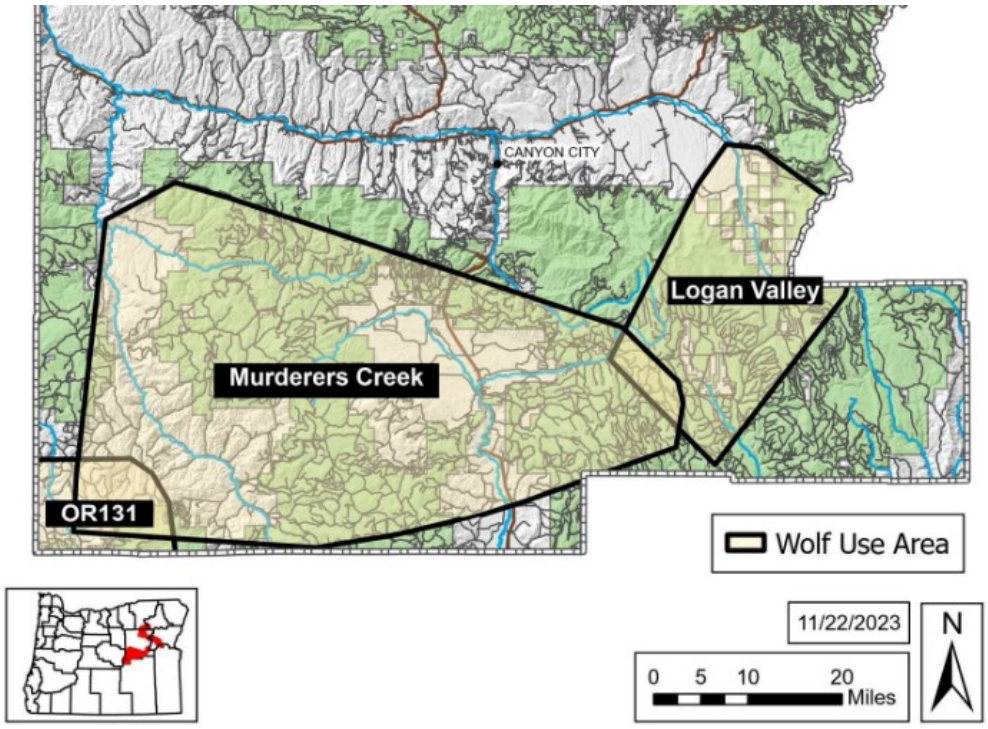

Figure 4. Murderers Creek Area of Known Wolf Activity and Logan Valley pack as of November 2023.

Risks and Stressors

The primary stressor to wolves continue to be human related, including illegal shooting, conflict with livestock which can result in lethal take permits, and vehicle collisions. Of the 20 wolf mortalities in Oregon in 2022, 17 were human caused (ODFW 2023). Of Washington's 37 wolf mortalities in 2022, 18 were human caused, with eight being due to wolf-livestock interactions and eight due to unlawful take (WDFW 2023).

A programmatic informal consultation for activities affecting wolves where they are listed has been prepared in anticipation of more wolves occurring west of the highway. Consultation is warranted where projects may cause direct disturbance at dens and rendezvous sites, and the renewal of livestock grazing permits (USDA 2017). Project design criteria have been developed and are generally applied regardless of the side of the highway to minimize wolf-livestock conflict.

The Washington Department of Fish and Wildlife consider wolves to have low to moderate vulnerability to climate change because wolves are adaptable and are habitat and diet generalists, resulting in low sensitivity, but have moderate exposure due to their wide-ranging habits which expose them to altered fire regimes, insect and disease outbreaks and potential altered prey abundance (WDFW 2023).

Information Needs

Continued monitoring of wolves in the plan area can aid in livestock allotment management. Increased knowledge of predator prey dynamics associated with climate change in the Blue Mountains would be helpful.

Wolverine

Existing Condition

Wolverine were recently listed as threatened (USFWS2023a). The plan area is outside of, but adjacent to the currently known distribution of breeding wolverine (*Gulo gulo*) populations (USFWS 2023b). Observations are occasionally reported, but no reproductive denning is known in the plan area. Camera stations in the Wallowa Mountains detected three individuals in 2011, two confirmed males and one likely a male (Figure 5). One wolverine has been detected each year since.

Figure 5. Wolverine in Wallowa-Whitman National Forest showing markings, photo credit: USFS.

The Wallowa-Whitman has the most potential wolverine habitat in the plan area (Raphael et al. 2001, Copeland et al. 2010). Habitat requirements include large amounts of remote, high elevation (1,800 to 3,500 meters) landscapes, access to a variety of food resources, structural features such as talus and down wood, rugged terrain, and persistent spring snowpack (USFWS 2023b). Currently, suitable environments are low to moderately distributed across the historical range of the wolverine and suitable environments exist at low abundance relative to their historical condition Wales et al. 2011)

Risks and Stressors

Management activities such as timber harvest, road operations, and fire suppression as well as public recreational use has the potential to disturb wolverine year-round. By far the biggest concern for wolverine is climate change due to their need for deep snow for denning. Spring snow cover has been shown to strongly correlate with wolverine denning locations and year-round movement and is also correlated to dispersal pathways across the landscape (Copeland et al. 2010, Schwartz et al. 2009). Anticipated declines in snowpack depth and duration (see Climate Change Impacts Report) and avoidance of areas with human disturbance, like winter recreation, will cause wolverine denning habitat to become fewer and farther between. They may tolerate winter recreation in some settings, but they avoid both motorized and non-motorized recreation (Heinemeyer et al. 2019). Recent advances in snowmobile technology capabilities have raised concerns about access to previously isolated areas (Wisdom et al. 2000) where natal denning may be occurring. Considering the lack of known historic and current reproduction in the area and future climate projections of reduced snowpack, a viable population of wolverines in the plan area is unlikely.

Information Needs

Information gaps for wolverine are primarily climate related. The point at which snowpack and temperature becomes a limiting factor is unknown (USFWS 2023). Wolverine have been documented

using other structures for denning in the absence of snow, but so far these instances have been in arctic or boreal ecosystems. It remains unclear if wolverine in alpine areas of the contiguous U.S. would be able to successfully den in shallower, smaller patches of snow or outside of snow-covered areas (USFWS 2023). Additionally, dispersal barriers such as highways and distance thresholds between high quality habitat patches, particularly for females which tend to disperse shorter distances, is important to understand but currently remains unclear.

Monarch

Existing Condition

The monarch butterfly (*Danaus plexippus*) (Figure 6) was determined to be warranted but precluded for listing as threatened or endangered under the Endangered Species Act in 2020, making it a candidate species (USFWS 2020a). The Blue Mountains have low to moderate potential breeding habitat identified using an all-milkweed species habitat suitability model (WAWFA 2019). Availability, spatial distribution, and quality of milkweed and nectar resources ranked as the top contributors in the decline of the western population of monarchs (USFWS 2020b).

Specific migration routes are largely unknown for the western population, but historical records suggest monarchs may use riparian corridors (WAFWA 2019). Documentation of monarch butterflies on the Blue Mountains National Forests are restricted to those recorded on the Western Monarch and Milkweed Occurrence Database(2018) (Milkweed Mapper) because it is the best source of observations available.

Figure 6. Monarch on milkweed; photo credit: Stephanie McKnight, Xerces Society

Malheur National Forest

All observations are of adults and are dated from 1961 to 2015 (Milkweed Mapper). The 2015 observation was just east of South Fork Antelope Creek, between National Forest Roads 3930-133 and 1601-844. Monarchs were seen from April to September, with most observations being in June and July. No larvae or pupae have been documented but their host plant, milkweed, is found on the

Forest. Milkweed species documented include showy milkweed (*Asclepias speciosa*), pallid milkweed (*A. cryptoceras*), and narrow-leaved milkweed (*A. fascicularis*).

Umatilla National Forest

All observations are of adult monarchs on the Umatilla dated from 1956 to 1982 (Milkweed Mapper). The two seen in 1982 were found along Alder Creek on the Heppner Ranger District. All monarchs were seen in July. No larvae or pupae have been documented but their host plant, milkweed, is found on the Forest. Milkweed species documented include showy milkweed and narrow-leaved milkweed.

Wallowa-Whitman National Forest

Documentation of monarch butterflies on the Wallowa-Whitman consists of 4 observations (Milkweed Mapper). All are adults with two dated July 1973 and two dated August 1984. The most recent observations were at Moss Springs Trailhead and in the vicinity of Fireline Creek. No larvae or pupae have been documented but their host plant, milkweed, is found on the Forest. Milkweed species documented include pallid milkweed and heartleaf milkweed (*A. cordifolia*). Showy milkweed and narrow-leaf milkweed also occur on the Wallowa-Whitman National Forest (M. Gaylord, personal communication, December 4, 2023).

Risks and Stressors

Primary threats to monarch butterflies across their range include loss and degradation of habitat, widespread use of herbicides, incompatible management of overwintering habitat, exposure to insecticides, and effects of climate change range wide (USFWS 2020a). On national forest lands, grazing and wildfire likely cause changes to milkweed distribution.

Climate change impacts to monarchs on their breeding range and along migration routes include multiple direct and indirect effects. Increasing temperatures may affect monarch mating success and survival during migration because monarchs are sensitive to heat stress (USFWS 2020b). Drought may reduce availability of nectar sources to migrating butterflies or timing of milkweed and other nectar sources may not align with monarch migration (USFWS 2020b). Some research also suggests that milkweed chemical properties which protect monarchs, will change with climate related increases in carbon dioxide, and lead to subsequent decreased tolerance of parasitic infections (USFWS 2020b). See Climate Change Impacts Report.

Juniper encroachment, attributed in part to fire suppression, is an example of a process happening in the planning area which broadly degrades, to varying degrees based on soil characteristics, shrub steppe and grasslands (general monarch habitat) by reducing abundance and diversity of nectar resources over time as juniper dominates sites and outcompetes other plant groups for soil and water resources (Coultrap et al. 2008; Miller et al. 2005). Riparian or mesic areas (typical milkweed sites) are also expected to face increased challenges with climate change and conifer encroachment which may impact groundwater level and reduce availability of monarch breeding sites.

Trends and Drivers

The western population of the monarch butterfly has been in general decline over the last 23 years and the probability of extinction over the next ten years is 60 to 68 percent and expected to increase to 92 to 95 percent over the next 30 years (USFWS 2020b). Drivers include availability and distribution of pesticide free host and nectar plants. Availability of host and nectar plants is influenced by timing and implementation of best management practices during forest management activities such as grazing, prescribed burning, and wildfire suppression.

Information Needs

Although monarchs have been documented on all three national forests, information is lacking on the extent and distribution of their host plant, milkweed. Many observations of both monarchs and milkweed have likely not been documented. Surveys of known milkweed patches for monarch larvae and pupae should be conducted to document important sites to monarch reproduction. Likewise, increased documentation of adults, would help identify migratory routes. Improved documentation of monarch observations (all life stages) and trends in milkweed patch sizes, distribution, and monarch use will inform adaptive management of sites and changes over time with climate change.

MacFarlane's Four O'clock

Existing Condition

MacFarlane's four o'clock (*Mirabilis macfarlanei)* was listed as endangered under the Endangered Species Act in 1979 but as more populations were discovered, MacFarlane's four o'clock was downgraded to threatened status (61 FR 10693-10697). MacFarlane's four o'clock is a perennial forb narrowly endemic to a small range in northeastern Oregon and adjacent west-central Idaho, growing predominantly in blue-bunch wheatgrass grasslands below 3,000 feet in the canyon grasslands ecological type described by Tisdale (1986).

MacFarlane's four o'clock In the Blue Mountains national forest is only known to occur in Hells Canyon National Recreation Area (HCNRA) and on private land inclusions within the administrative boundary, which are both outside of the plan area.

Wallowa-Whitman National Forest

Suitable habitat for Macfarlane's four o'clock within the Wallowa-Whitman National Forest has been identified using a model (Murray 2001). Physical and biological attributes from known Macfarlane's four o'clock sites, including vegetation type, elevation, slope, and aspect, were weighted, and used to map areas that have the potential to support the species. Murray (2001) categorized potential habitats by probability as moderate, high, or very high. The model ranks 11 of 12 known Macfarlane's four o'clock occurrences in the Hells Canyon National Recreation Area as very high potential (8 sites) or high (3 sites) potential habitat. One four o'clock site in the Hells Canyon National Recreation Area inhabits an area not predicted by the model. Within the plan area portion of the Wallowa-Whitman National Forest, the model identifies 1,258 acres of high potential habitat. The model does not identify

any moderate or very high potential habitat within the plan area. The purpose of the model is to identify areas to prioritize field inventories for Macfarlane's four o'clock; it does not definitively identify suitable habitat or occupied habitat.

Risks and Stressors

Existing threats to MacFarlane's four o'clock include invasions by aggressive nonnative plants, poor to degraded land health conditions, and changing fire frequency and seasonality. Interannual variation in precipitation, which is exacerbated by climate change also affects plant vigor, recruitment, and viability at sites.

Information Needs

Although previous surveys in very high and high potential habitat as identified by the model resulted in no additional MacFarlane's four o'clock sites on the Wallowa-Whitman National Forest, additional surveys for the plant would be advisable because accuracy of models vary. One site in HCNRA is in an area not identified by the model.

Spalding's Catchfly

Existing Condition

Spalding's catchfly (*Silene spaldingii*) is an herbaceous perennial in the pink family (Caryophyllaceae). The plant is endemic to the Palouse grasslands of southeastern Washington and adjacent Oregon and Idaho, and is disjunct in northwestern Montana and British Columbia, Canada. Spalding's catchfly inhabits predominantly the Pacific Northwest bunchgrass grasslands and sagebrush-steppe and occasionally in open-canopy pine stands. The U.S. Fish and Wildlife Service listed Spalding's catchfly as threatened under the Endangered Species Act effective October 10, 2001 (USFWS 2001). The Forest Service manages a minority of the Spalding's catchfly inhabiting the Palouse region.

Umatilla National Forest

Spalding's catchfly is located on the Umatilla National Forest near the far northeastern corner of the Pomeroy Ranger District. The Forest Service has mapped about 111 acres of Spalding's catchfly occupied habitat in this area. The recovery plan (USFWS 2007) includes this population in the Blue Mountains Foothills key conservation area. Some plants in this area are in a private inholding. The area where Spalding's catchfly occurs includes portions of four open ridges on the south side of Lick Creek (Cabin, Sheep, Sourdough, and Bracken ridges) and the intervening draws that support plant communities typical of the Canyon Grasslands (Johnson and Simon 1987, Tisdale 1986). One road bisects this area following Sourdough Gulch. Three patches of Spalding's catchfly are about 100 to 130 meters southeast of the road and between 100 and 200 feet higher in elevation.

All plants are within active grazing allotments, although the pastures have been rested until consultation with the USFWS can be completed, on the Umatilla National Forest. These areas have been surveyed for the presence of sensitive species, including specific surveys for Spalding's catchfly in 1997 and 2000 (USDA 2006). Condition of grasslands in the vicinity inhabited by Spalding's catchfly

is variable: the northerly slopes and ridge tops are reported in good to excellent condition (USDA 2006), whereas exotic plants, including state listed noxious weeds, such as yellow star thistle (*Centaurea solstitialis*), have invaded the southerly slopes.

Wallowa-Whitman National Forest

The recovery plan identifies four Spalding's catchfly key conservation areas in the Blue Mountains Basins physiographic region. Two key conservation areas partly or almost entirely overlap the Wallowa-Whitman National Forest. The Crow Creek key conservation area is located largely in the Wallowa-Whitman, with an estimated 2,400 plants (USFWS 2007). As the third largest population range-wide, the Crow Creek key conservation area plays a leading role in the conservation of Spalding's catchfly.

The Clear Lake Ridge key conservation area encompasses National Forest System, Bureau of Land Management, and private lands. Most patches of Spalding's catchfly at Clear Lake Ridge are on private land but more than half the plants (520 of 850) grow at one patch on the Wallowa-Whitman National Forest. An additional 330 plants occupy several small patches that are predominantly on private land. A small portion of one patch overlaps with Bureau of Land Management administered land. The two other key conservation areas in the Blue Mountains Basins physiographic region do not occur on National Forest System lands. Spalding's catchfly occupied habitat totals approximately 100 acres on the Wallowa-Whitman National Forest.

A systematic approach to measure population sizes began in 2008 in partnership with The Nature Conservancy. Using statistically valid methods, The Nature Conservancy measured the area, frequency, and density of Spalding's catchfly at Crow Creek and Clear Lake Ridge. Density and area measurements were used to estimate population size. Three years of results have been summarized (Jansen and Taylor 2010). The Nature Conservancy's statistical population estimates exceed the values recorded by the Forest Service and approximately double both the Crow Creek population estimates (Table 9). The Forest Service estimated population sizes by means of walk-through visual inventories. Based on their statistical methods, the Forest Service considers The Nature Conservancy estimates to be more accurate.

Table 9. Spalding's catchfly population estimates at Crow Creek and Clear Lake Ridge Key Conservation Areas

Key Conservation Area	Forest Service Population Estimate	Nature Conservancy Population Estimate
Crow Creek (East)	266-1,006	1,665-7,363 (2008) 520-2,284 (2009) 558-2,368 (2010)
Crow Creek (West)	822-2,259	2,306-7,242 (2008) 2,834-7,740 (2009) 854-3,586 (2010)
Clear Lake Ridge	750-1,970	30-1,450 (2009)

All populations on National Forest System lands in Oregon are within active grazing allotments. Invasive plants threaten Spalding's catchfly at both key conservation areas on the Wallowa-Whitman National Forest. The Spalding's catchfly population within the Clear Lake Ridge key conservation area is infested with sulfur cinquefoil (Potentilla recta). North Africa grass (Ventenata dubia) is present at the Crow Creek key conservation area (Wallowa-Whitman National Forest). Annual exotic bromes (Bromus tectorum, B. japonicus, B. secalinus) are present at most Spalding's catchfly sites.

Risks and Stressors

Across its range, the main threats facing Spalding's catchfly are habitat loss due to development, habitat degradation associated with grazing and trampling, and invasions of aggressive, nonnative plants (USFWS 2007). In addition, a loss of genetic fitness is a problem for small, fragmented populations where genetic exchange is limited.

Other impacts include changes in fire frequency and seasonality, off-road vehicle use, and herbicide spraying and drift. On National Forest System lands, the main threats to Spalding's catchfly are invasions by aggressive, nonnative plants, grazing, and changes in fire frequency and seasonality. Invasive plants currently documented as a threat to Spalding's catchfly on Forest Service administered sites include yellow star thistle, sulfur cinquefoil, North Africa grass, Japanese brome, downy brome, and rye brome.

Trends and Drivers

Goals for delisting include: 1) establishment and, or maintenance of 27 key conservation areas with at least 500 reproducing Spalding's catchfly individuals in each area, 2) populations showing stable or increasing trends for at least 20 years, and 3) intact habitat throughout its historical range. Numerous conservation actions are moving this species towards recovery, but overall, Spalding's catchfly is not secure from threats range wide (USFWS 2020). This species has lost much of its habitat, to agricultural conversion on private lands. Drivers of populations on National Forest System lands include availability of appropriate ecological sites, density of non-native plants competing for pollinators and soil resources, and abundance of seed weevils and other herbivores large and small. Climate change is anticipated to affect the habitat distribution of Spalding's catchfly in future due to direct effects on temperature and potential changes in soil water availability as well as indirect effects through changes in likelihood of high-severity disturbance (see Climate Change Impacts Report).

Information Needs

Additional surveys are needed for Spalding's catchfly. The plant does not come up every year, making monitoring challenging. Existing habitat models are also in need of improvement to better correlate with known sites and predict suitable sites for the species, especially considering how climate may affect distribution of suitable sites.

Whitebark Pine

Existing Condition

The U.S. Fish and Wildlife Service listed whitebark pine (*Pinus albicaulis*) (Figure 6) as threatened under the Endangered Species Act effective January 17, 2023 (USFWS 2022). The tree has a limited distribution (Figure 7) within the Blue Mountains and is strongly associated with higher elevation areas within the cold forest potential vegetation group and within wilderness areas. Based on Forest Service vegetation databases, the Wallowa-Whitman National Forest contains the largest acreage of whitebark pine, with the Umatilla and Malheur National Forests containing smaller extents. The whitebark pine terrestrial ecosystem currently exhibits low ecological integrity (See Terrestrial Ecosystems Report).

Figure 7. Whitebark pine; photo credit: National Park Service

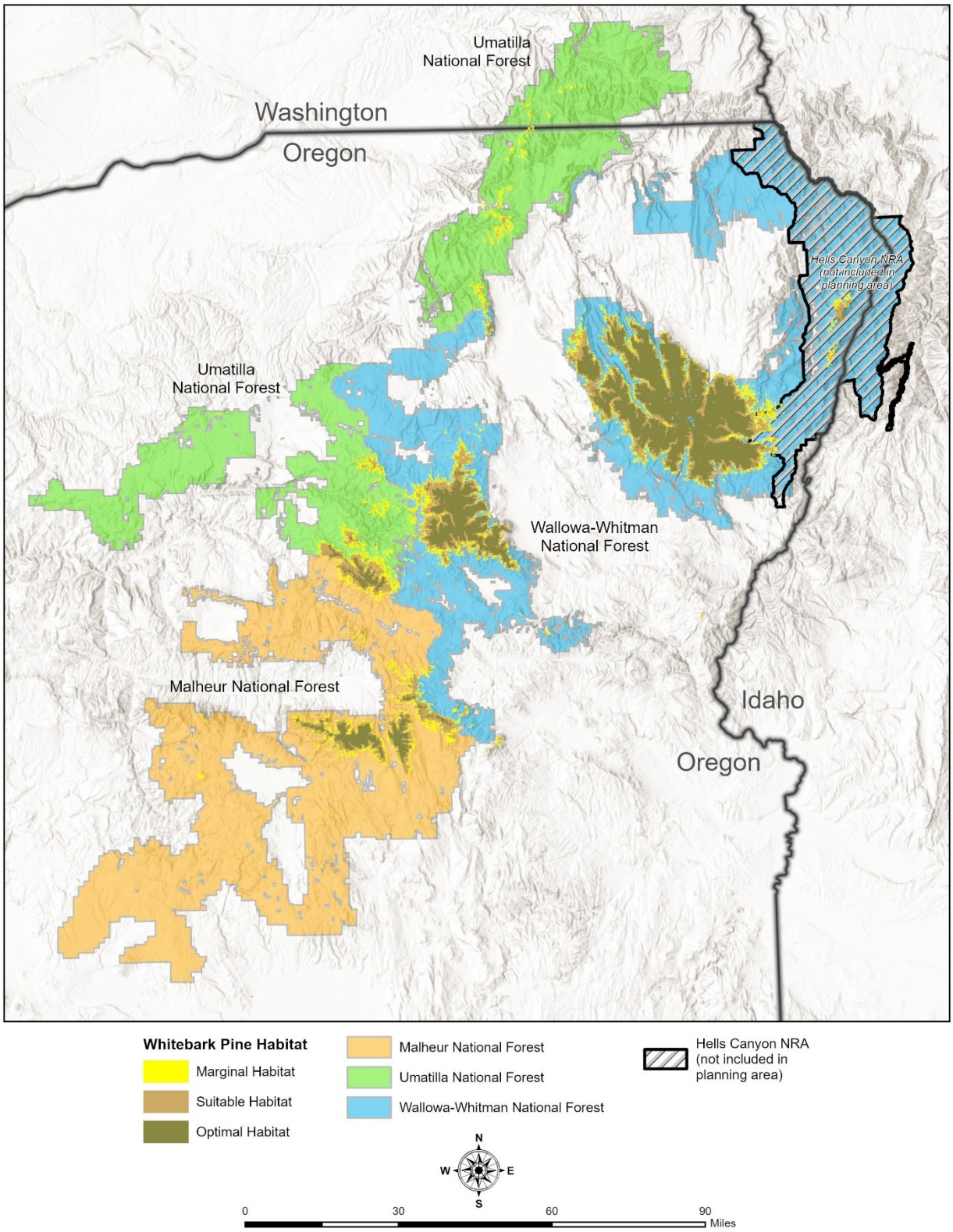

Figure 8. Whitebark Pine Habitat in the Blue Mountains national forests

Malheur National Forest

A little over 118,000 acres of potential whitebark pine habitat is present on the Malheur National Forest. White pine blister rust is present at low levels in the Strawberry Mountains. More trees are healthy than diseased (M. McWilliams, Forest Pathologist, personal communication, December 8, 2023).

Umatilla National Forest

An estimated 78,000 acres of potential whitebark pine habitat is present on the Umatilla National Forest, with most of it classified as marginal. About a third of the trees on Vinegar Hill are infected with white pine blister rust (M. McWilliams, Forest Pathologist, personal communication, December 8, 2023).

Wallowa-Whitman National Forest

Almost 620,000 acres of potential whitebark pine habitat is present on the Wallowa-Whitman National Forest, with almost 160,000 and nearly 361,000 of those acres considered suitable and optimal respectively. Monitoring transects within the Blue Mountains analysis area indicate white pine blister rust infection within the majority of checked sites. Whitebark pine stands in the Elkhorn Mountains exhibit higher levels of white pine blister rust infection compared to the Wallowa Mountains.

Risks and Stressors

Existing threats to whitebark pine include the exotic disease white pine blister rust (caused by the fungal pathogen *Cronartium ribicola*), mountain pine beetle (*Dendroctonus ponderosae*) outbreaks, altered disturbance regimes in stands where whitebark pine is a seral species, and climate change (Halofsky and Peterson 2017, USFWS 2021). These stressors are discussed more in depth below, as they are also drivers of whitebark pine abundance and distribution in the Blue Mountains planning area.

Trends and Drivers

After decades of decline, an estimated 51 percent of all standing whitebark pine trees in the United States were dead as of 2016 (Goeking and Izlar 2018). The Species Status Assessment (USFWS 2021) represents a compilation of the best available science on the status of whitebark pine and is hereby incorporated by reference. It describes the biology and existing condition of the species across its range as well as the predicted future impacts of the identified stressors.

White pine blister rust: White pine blister rust is present across the planning area and is impacting whitebark pine trees of all sizes. Growth rates and survival to maturity have been reduced. Branch die-back and tree mortality has reduced reproduction potential. In some areas within the planning area, previous whitebark pine dominated stands now consist of snags, variable quantities of whitebark pine advanced regeneration, and subalpine fir or Engelmann spruce.

Altered fire regimes: Current stand conditions in the planning area reflect stand development following large high- and mixed severity fires that occurred in the late 1800s and early 1900s. Since then, there has been a lack of large-scale disturbance. Historically, fires were a common disturbance

agent in northeast Oregon forests. Without regular disturbance, primarily from fire, whitebark pine communities experience increased competition and follow successional pathways that eventually lead to dominance by shade-tolerant conifers to the exclusion of whitebark pine (Keane and Parsons 2010).

Mountain pine beetle: Mountain pine beetles continue to kill susceptible trees in northeast Oregon and are currently at elevated levels in the planning area due to ongoing warm and dry conditions combined with high levels of tree competition. Over the past five years mountain pine beetle have caused moderate to high levels of mortality where their host species occur, primarily in lodgepole pine. Beetles from infested lodgepole pine stands can move to adjacent whitebark pine stands, so thinning and management in lower elevation lodgepole stands can reduce beetle pressure on whitebark stands.

Climate change: The planning area is experiencing impacts of climate change, including rising temperatures (see Climate Change Impacts Report), like the effects experienced across the range of whitebark pine. Changes in climate have a board array of direct and indirect effects on whitebark pine, including anticipated habitat loss and altered frequency and intensity of disturbances caused by fire and disease, to such an extent that whitebark pine may not be able to persist (USFWS 2021).

Information Needs

More surveys in whitebark pine habitat are needed to ground truth the suitability model and address multiple information gaps (M. McWilliams, Forest Pathologist, personal communication, December 22, 2023). More surveys would help better assess the prevalence and impact of white pine blister rust in the planning area and document whitebark pine reproduction, or lack thereof, in recent wildfire areas. Increased planting of rust resistant trees to hopefully increase the amount of rust resistant seeds, followed by monitoring, is a management need.

Key Benefits

Fish such as salmon, trout, and steelhead have cultural, social, and economic importance in the Blue Mountains. They are popular sport fish for anglers and are key to maintaining outfitter and guide businesses and supporting local economies. Salmon are a culturally significant food for local tribes. Fish also serve important ecological roles in the Blue Mountains. They are an integral part of complex food webs. Salmon and steelhead, being anadromous (migrating up rivers from the sea to spawn), are key to nutrient exchange between marine and inland freshwater systems.

Wolves play a role in maintaining ecological integrity. Gray wolves, as a top predator, influence the abundance, health, distribution, and behavior of prey species such as elk, with cascading effects on vegetation vigor.

Monarch butterfly and bumble bees pollinate a variety of native inland northwest flowers (USFWS 2020b). A few examples include western coneflower (*Rudbeckia occidentalis*), mountain monardella (*Monardella odoratissima*), woods' rose (*Rosa woodsia*), and sulphur-flower buckwheat (*Eriogonum umbellatum*) (Xerces Society 2016).

Key benefits of native perennial plants include erosion control, wildlife habitat, and visual beauty. The deep roots of native perennial plants hold soil in place and help prevent runoff. Native wildlife species also depend on native plants for survival. Tubbesing et al. (2014) found that Spalding's catchfly is primarily pollinated by the yellow bumble bee (*Bombus fervidus*), a potential Species of Conservation Concern, and the white-shouldered bumble bee (*B. appositus*). The plant may also provide nectar for halictid bees, noctuid moths, and vesper moths (Tubbesing et al. 2014). MacFarlane's four o'clock and Spalding's catchfly are unique flora species of the Blue Mountains contributing to regional floral diversity. Additionally, native perennial forbs have intrinsic and extrinsic scenic value, providing a variety of colors and shapes to the Blue Mountains landscape. Local economies benefit from nature tourism, including wildflower viewing and photography.

Whitebark pine is considered both a keystone species for promoting community diversity and a foundation species for promoting community stability (Tomback et al. 2001; Schwandt 2006; Keane et al. 2012). As an important ecosystem component that influences the success of other organisms, it plays a vital role in colonizing areas disturbed by fire or landslides, stabilizing the soil, moderating snow melt, and providing the cover that allows regeneration of other tree species. Seed dissemination by whitebark pine is unique among American pines. The seeds are mostly released from cones and disseminated by a bird species, the Clark's nutcracker (*Nucifraga columbiana*) (Tomback et al. 2001). Many other wildlife species of high-elevation ecosystems also depend to varying degrees on whitebark pine seeds as food resources (Tomback et al. 2021).

Key Findings

The Forest Service is required to manage habitats for these species within National Forest System lands to aid in achieving recovery objectives so that special protection measures provided under the Endangered Species Act are no longer necessary in the future. Protecting and managing listed species and their habitats continue to be important issues because of population declines, threats, range contraction, and habitat degradation and fragmentation. Threatened, Endangered, Proposed and Candidate species will receive continued protection through consultation with the U.S. Fish and Wildlife Service.

The most recent status assessments of Chinook salmon and steelhead (NMFS 2022a-d) indicate that major population groups in the Mid-Columbia and Snake River Basins are not viable. Recovery goals have yet to be obtained. Current bull trout populations trends are largely unknown across the planning area. The primary drivers, stressors, and key ecological characteristics for listed fish species include water quality, water quantity, aquatic thermal refugia, and aquatic habitat connectivity.

All known whitebark pine stands in the Blue Mountains have some level of white bark pine blister rust and more surveys and data are needed on species like monarchs and Spalding's catchfly. Wolverines in the planning area are not known to be reproducing and wolves may be nearing capacity due to continued wolf population expansion. Stressors for listed species include fire frequency and severity, invasive species, disease, host and nectar plant availability, human disturbance, infrastructure, and climate change.

Conserving listed species is also an integral part of maintaining ecological integrity of terrestrial and aquatic systems. Increased levels of whitebark pine mortality may alter high-elevation community composition and ecosystem processes similarly to what has been seen in other areas of the western United States (Keane et al. 2012). Healthy salmon and trout populations are important culturally and economically. Maintaining top predators on the landscape is part of maintaining diversity and balance.

Species of Conservation Concern (SCC)

Introduction

National Forest System lands administered by the Forest Service in the Blue Mountains have long served an important role in supporting a variety of species. Managing ecosystems to sustain terrestrial wildlife species depends on maintaining the appropriate mix of habitat quantity, quality, and distribution across the landscape. Most habitats for terrestrial wildlife species are shaped by vegetation characteristics, although in some cases it is an individual component, such as snags or talus slopes. Landscapes are diverse, highly complex systems influenced by many factors, including the interaction of soils, aspect, elevation, climate, disturbance events, and humans. Together these influences have shaped vegetative composition and patterns that have influenced the distribution and quality of wildlife habitat across the landscape.

Species of conservation concern (SCC) are species that the Regional Forester determines that the best available scientific information indicates substantial concern about the species' capability to persist over the long term in the planning area (36 CFR 219.9). Considering SCC during forest plan revision helps maintain native plant and animal diversity in the planning area. All taxonomic groups are considered when developing lists of potential SCC, from nonvascular plants like fungi to large charismatic mammals.

Species accounts are prepared for each of these species, which represent best available science and helps determine whether unique forest plan components are needed to maintain them. Over 300 species accounts are being prepared and reviewed, followed by rationale statements that support a decision to keep each one on the SCC list, or remove them. Species that move forward will be grouped by representative habitats or stressors, for example, to then create or evaluate forest plan components.

Each forest has its own SCC list (Appendices 1,2,3), however many of the potential species occur on all three Blue Mountains forests, some are on two forests, and some are only one forest. The current potential SCC list has 167 species on the Malheur National Forest, 196 species on the Umatilla National Forest, and 278 species on the Wallowa-Whitman National Forest. Plant species are the most numerous, followed by birds; other groups such as fish, mammals, amphibians, reptiles, and invertebrates have fewer species to consider.

Figure 9. A selection of potential SCC; top row left to right: arrow-leaf thelypody (*Thelypodium eucosmum*) by Jessi Brunsun, hoary bat (*Lasiurus cinereus*) by Daniel Neal, black-backed woodpecker (*Picoides arcticus*) by USFWS; bottom row left to right: western bumble bee (*Bombus occidentalis*) by Laura Navarette, Columbia spotted frog (*Rana luteiventris*) by USFS.

Current Forest Plan Direction

The existing forest plans include responsibilities to address Forest Service sensitive species. Prior revision efforts (USDA 2018) chose focal species to monitor plan effectiveness and surrogate species to protect or manage habitat for 175 species of concern. The process to develop Species of Conservation Concern with the 2012 planning rule is similar but different. Development of SCC will include multiple public engagement opportunities to provide comments about the lists and will include plant and other SCC in addition to wildlife.

Existing Condition

Existing conditions cannot be generalized for hundreds of Species of Conservation Concern. According to prior analyses of wildlife species viabilities, there are some potential SCC that are likely to persist under current management, and others that need further management requirements in new forest plans. Most species evaluated have less habitat now than what occurred historically (Wales et al. 2011). The habitat with the greatest departure from historical variability across all three forests and is dry forest with medium to large trees and snags. Potential SCC included in the dry forest habitat

association group, such as white-headed woodpecker and flammulated owl, have more isolated suitable environments and exist at very low abundance relative to historical conditions.

A key assumption is that if management trends toward the historical range of variability across ecosystems, the population viability for most species will be maintained or improved. For some species at risk, additional requirements can be developed. This is referred to as a coarse filter / fine filter approach. New guidance to enhance and protect habitat for SCC will be developed in the plan revision process.

After public comment, a preliminary SCC list will be determined, and species will be grouped by habitats, stressors, or other categories to develop plan components. A single species may occur in several groups. The goal is to manage forests in a way that maintains species at risk habitat and populations over time.

Species of Conservation Concern Risks, Trends, and Information Needs

Risks and Stressors

Key ecological conditions and stressors for potential species of conservation concern can generally be characterized as either aquatic or terrestrial focused. For the primarily aquatic species, key ecological conditions are water quality and water quantity. Water quantity and quality can be affected at landscape scales by changes in climate as well as vegetation. Large scale change to vegetation may be caused by large, moderate or high severity fire, and by impacts from more chronic changes to hydrology such as roads, landslides, and diversions. Changes can also occur at smaller local sites, which can be important for species with limited populations or limited habitat. For the more terrestrial wetland/riparian associated species, ground disturbance from a variety of sources could directly impact individuals through changes in surface cover substrate, such as rocks, logs or forest vegetation litter. They can also be negatively affected by fire, but their habitat may be maintained or improved with the restoration of periodic low severity fire. As these species tend to be localized, trends can only be evaluated in the context of known populations and their habitats within their known or potential range.

Habitat degradation is one of the most cited factors in the decline of resident and anadromous fish species in the Pacific Northwest (Gregory and Bisson 1997). Habitat quality may still be in decline in some parts of the Blue Mountains. McIntosh et al. (1994a) noted significant declines in large pool habitats in managed watersheds between 1930 and 1990, while increases in large pool habitat were noted in unmanaged watersheds during the same period. High road densities continue to contribute to poor aquatic and riparian habitat conditions and culverts block or impair access by aquatic species to more than 3,700 miles of streams within the three national forests in the Blue Mountains.

For terrestrial plant and animal SCC, primary key ecological characteristics, drivers, and stressors include roads, changing forest structures (tree density, tree species composition, age class, snag and

down wood abundance and distribution), wildfire, lack of habitat connectivity, invasive species, and climate change.

Climate change has the potential to have substantial impacts to species and their habitats (see Climate Change Impacts Report). Potential SCC with high climate change vulnerability ratings include, but are not limited to, Rocky Mountain tailed frog, American goshawk, boreal owl, Cassin's finch, and Columbia spotted frog (CTCN 2013). Changes may include loss of habitat and food supply, altered disturbance regimes, extreme air temperatures, and stream temperature changes.

Trends and Drivers

Trends for potential SCC differ greatly due to the wide variety of species. Habitat assessments of landscape conditions and trends in the Columbia Basin have identified several factors influencing change in forested and non-forested habitat conditions that have occurred since early Euro-American settlement (Wisdom et al. 2000). Depending upon the vegetation type examined, these factors included fire exclusion, timber harvest, road and urban development, grazing, and recreational uses. Implications for wildlife species include:

- Changes in forest structure and composition that may contribute to uncharacteristic wildfire behavior in lower elevation forest types.
- Roads that fragment habitat and cause disturbance
- Competition from invasive plant species that compromises plant diversity, habitat quality, and connectivity.
- A reduction or degradation of habitats for some wildlife and plant species where human impacts have occurred, or where natural disturbance regimes have been altered.
- Urban development and infringement into some traditionally important wildlife habitats (including big game winter range), typically at lower to moderate elevations.

Changes in vegetation due to natural and human-caused disturbance have affected terrestrial wildlife species and their habitat within the Blue Mountain National Forests. For example, early timber and fire management strategies within dry forest have resulted in an ecosystem that is highly departed from what occurred historically (see Terrestrial Ecosystem Report). This leads to concern for the viability of some species, such as the white-headed woodpecker, that rely heavily on this ecosystem. Current management is working to manage forest landscapes to be more in line with a natural range of variation. The idea is that if terrestrial and aquatic/wetland/riparian ecosystems are maintained within the established historical range of variation, native wildlife which evolved in these landscapes under historic disturbance regimes will also persist in the long term.

Information Needs

There are numerous species across the Blue Mountains forests, primarily plants and invertebrates, for which inadequate information is currently available to determine whether there is concern for their persistence into the future. Survey data and research on the habitat needs of species with inadequate information are needed to accurately portray the long list of species across the Blue Mountains forests

for which there is risk of extirpation. There is a process to later revise the SCC list, should information become available that indicates concern for a species persistence into the future or the presence of species not previously documented. Forest plans may also be amended if plan components do not protect newly identified SCC.

Key Benefits

Hunting and fishing are traditional recreational, subsistence and treaty uses within the national forests in the Blue Mountains. See the Tribal and Treaty Resources Report. Potential SCC include huntable big game such as bighorn sheep (*Ovis canadensis*), sport fish like redband trout (*Oncorhynchus mykiss*) and cutthroat trout (*Oncorhynchus clarkii lewisi*), and watchable wildlife. As such, SCC can have substantial influence on the social and economic sustainability of local communities. Resident and migratory bird species in the United States generate more than 96 billion dollars in overall economic output and are enjoyed by more than 45 million people with the economic impact is distributed across local, state, and national economies (USFWS 2016). Many potential SCC plants are used by tribes as food and weaving material.

Species of Conservation Concern provide vital ecosystem services such as pollination, water filtration (e.g., freshwater mussels), insect pest control (e.g., bats, nighthawks, swifts), host plants for other species, and ecosystem engineering to provide habitat for other wildlife species, thus contributing to overall wildlife diversity.

Key Findings

The Forest Service must maintain viable populations of all native animal and plant species and implement practices to ensure that species do not become threatened or endangered because of agency actions. Potential SCC include pollinators, species providing important ecological services like water filtration and pest control, ecosystem engineers, and huntable wildlife, thus having influence on ecological, social, and economic sustainability in the region.

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Appendix 1. Potential Species of Conservation Concern – Malheur National Forest

Bryophytes (8)		
moss	*Bryum calobryoides*	BRCA20
moss	*Campylium stellatum*	CAST51
moss	*Polytrichum strictum*	POST70
liverwort	*Preissia quadrata*	PRQU2
moss	*Racomitrium depressum*	RADE6
moss	*Schistidium cinclidodonteum*	SCCI5
moss	*Tortula mucronifolia*	TOMU70
liverwort	*Tritomaria exsecta*	TREX4
Fungi (2)		
	Rhizopogon abietis	RHAB
	Sparassis crispa	SPCR4
Lichens (2)		
	Aspicilia rogeri	ASRO12
	Schaereria dolodes	SCDO3
Vascular Plants (67)		
Pinewoods needlegrass	*Achnatherum pinetorum*	ACPI2
Sierra onion	*Allium campanulatum*	ALCA2
Meadow pussy-toes	*Antennaria corymbosa*	ANCO
Davis's milkweed	*Asclepias cryptoceras ssp. davisii*	ASCRD2
Narrowleaf milkweed	*Asclepias fascicularis*	ASFA
Showy milkweed	*Asclepias speciosa*	ASSP
Idaho milk-vetch	*Astragalus conjunctus var. conjunctus*	ASCOC10
South Fork John Day milk-vetch	*Astragalus diaphanus var. diurnus*	ASDID4
Bastard kentrophyta	*Astragalus tegetarioides*	ASTE4
American Sloughgrass	*Beckmannia syzigachne*	BESY
Upward-lobed moonwort	*Botrychium ascendens*	BOAS2
Crenulate moonwort	*Botrychium crenulatum*	BOCR
Slender moonwort	*Botrychium lineare*	BOLI7
Moonwort	*Botrychium lunaria*	BOLU
Gray moonwort	*Botrychium minganense*	BOMI
Mountain grape-fern	*Botrychium montanum*	BOMO
Rattlesnake fern	*Botrypus virginianus*	BOVI8
peck's mariposa-lily	*Calochortus longebarbatus var. peckii*	CALOP4
Cordilleran sedge	*Carex cordillerana*	CACO81
Different nerve sedge	*Carex heteroneura var. epapillosa*	CAHEE
Idaho sedge	*Carex idahoa*	CAID
Alaskan single-spiked sedge	*Carex scirpoidea ssp. stenochlaena*	CASCS9
Tahoe sedge	*Carex tahoensis*	CATA

Cusick's paintbrush	*Castilleja cusickii*	CACU7
Sticky paintbrush	*Castilleja viscidula*	CAVI9
Alaska yellow-cedar	*Chamaecyparis nootkatensis*	CANO9
Pine woods cryptantha	*Cryptantha simulans*	CRSI2
Snowline spring-parsley	*Cymopterus nivalis*	CYNI3
doublet	*Dimeresia howellii*	DIHO2
Bolander's spikerush	*Eleocharis bolanderi*	ELBO
Swamp willow-herb	*Epilobium palustre*	EPPA
Disappearing monkeyflower	*Erythranthe inflatula*	ERIN14
hairy sweetgrass	*Hierochloe odorata*	HIOD2
Rydberg's gilia	*Ipomopsis tenuituba*	IPTE4
Least rush	*Juncus hemiendytus var. abjectus*	JUHEA
Dwarf rush	*Juncus hemiendytus var. hemiendytus*	JUHEH
Northern twayblade	*Listera borealis*	LIBO4
Lassen parsley	*Lomatium ravenii var. paiutense*	LORA
Spider biscuitroot	*Lomatium pastorale*	LOPA9
Colonial luina	*Luina serpentina*	LUSE
Cusick's lupine	*Lupinus lepidus var. cusickii*	LULEC7
Washington Monkeyflower	*Mimulus washingtonensis var. washingtonensis*	MIWA2
Nuttall's sandwort	*Minuartia nuttallii ssp. fragilis*	MINUF
Mousetail	*Myosurus clavicaulis*	MYCL
Adder's-tongue	*Ophioglossum pusillum*	OPPU3
Brewer's cliff-brake	*Pellaea breweri*	PEBR4
Variable hot-rock penstemon	*Penstemon deustus var. variabilis*	PEDEV2
Dwarf phacelia	*Phacelia minutissima*	PHMI7
Hot spring phacelia	*Phacelia thermalis*	PHTH
Many-flowered phlox	*Phlox multiflora*	PHMU3
Little ricegrass	*Piptatheropsis exigua*	PIEX4
Skunk polemonium	*Polemonium viscosum*	POVI
Fremont's combleaf	*Polyctenium fremontii*	POFR
Austin's knotweed	*Polygonum austiniae*	POAU2
Gabriela's knotweed	*Polygonum gabrielae*	
Lemmon's hollyfern	*Polystichum lemmonii*	POLE5
common sword fern	*Polystichum munitum*	POMU
Flatleaf pondweed	*Potamogeton robbinsii*	PORO2
Darrach's cinquefoil	*Potentilla versicolor var. darrachii*	
Mountain buttercup	*Ranunculus populago*	RAPO
Alpine sedum	*Rhodiola integrifolia ssp. integrifolia*	RHINI
Lowland toothcup	*Rotala ramosior*	RORA
Glaucus willow	*Salix glauca ssp. glauca var. villosa*	SAGLV
Snow willow	*Salix nivalis*	SANI8
Swertia	*Swertia perennis*	SWPE

Arrow-leaf thelypody	*Thelypodium eucosmum*	THEU
Slender bog arrowgrass	*Triglochin palustris*	TRPA28
Invertebrates (10)		
California floater	Anodonta californiensis	
Yellow bumblebee	Bombus fervidus	
Western bumblebee	Bombus occidentalis	
Suckley cuckoo bumble bee	Bombus suckleyi	
Harney Basin duskysnail	Colligyrus depressus	
Western ridged mussel	Gonidea angulata	
Blue Mtn Juga	Juga caerulea (Juga sp. 2)	
Pristine springsnail	Pristinicola hemphilli	
Fir pinwheel	Radiodiscus abietum	
Great basin fritillary	Speyeria egleis / *Argynnis egleis*	
Amphibians (2)		
Western toad	*Anaxyrus boreas*	
Columbia spotted frog	*Rana luteiventris*	
Birds (57)		
American Goshawk	*Accipiter atricapillus* (formerly *Accipiter gentilis*)	
Boreal Owl	*Aegolius funereus*	
Sandhill Crane	*Antigone canadensis* (formerly *Grus canadensis*)	
Golden Eagle	*Aquila chrysaetos*	
Short-eared Owl	*Asio flammeus*	
Long-eared Owl	*Asio otus*	
Upland Sandpiper	*Bartramia longicauda*	
Bufflehead	*Bucephala albeola*	
Swainson's Hawk	*Buteo swainsoni*	
Wilson's Warbler	*Cardellina pusilla*	
Greater Sage-Grouse	*Centrocercus urophasianus*	
Vaux's Swift	*Chaetura vauxi*	
Common Nighthawk	*Chordeiles minor*	
Evening Grosbeak	*Coccothraustes vespertinus*	
Olive-sided Flycatcher	*Contopus cooperi*	
Western Wood-Pewee	*Contopus sordidulus*	
Dusky Grouse	*Dendragapus obscurus*	
Bobolink	*Dolichonyx oryzivorus*	
White-headed Woodpecker	*Dryobates albolarvatus* (formerly *Picoides albolarvatus*)	
Pileated Woodpecker	*Dryocopus pileatus*	
Cordilleran Flycatcher	*Empidonax occidentalis*	
Willow Flycatcher	*Empidonax traillii*	
Gray Flycatcher	*Empidonax wrightii*	
Peregrine Falcon	*Falco peregrinus*	
Pinyon Jay	*Gymnorhinus cyanocephalus*	
Cassin's Finch	*Haemorhous cassinii*	

Bald Eagle	*Haliaeetus leucocephalus*
Yellow-breasted Chat	*Icteria virens*
Varied Thrush	*Ixoreus naevius*
Belted Kingfisher	*Megaceryle alcyon*
Lewis's Woodpecker	*Melanerpes lewis*
Long-billed Curlew	*Numenius americanus*
Mountain Quail	*Oreortyx pictus*
Sage Thrasher	*Oreoscoptes montanus*
American White Pelican	*Pelecanus erythrorhynchos*
Black-backed Woodpecker	*Picoides arcticus*
American Three-toed Woodpecker	*Picoides dorsalis* (formerly *Picoides tridactylus*)
Green-tailed Towhee	*Pipilo chlorurus*
Eared Grebe	*Podiceps nigricollis*
Mountain Chickadee	*Poecile gambeli*
Flammulated Owl	*Psiloscops flammeolus*
Golden-crowned Kinglet	*Regulus satrapa*
Calliope Hummingbird	*Selasphorus calliope*
Rufous Hummingbird	*Selasphorus rufus*
Townsend's Warbler	*Setophaga townsendi*
Western Bluebird	*Sialia mexicana*
Pygmy Nuthatch	*Sitta pygmaea*
Cinnamon Teal	*Spatula cyanoptera*
Red-naped Sapsucker	*Sphyrapicus nuchalis*
Red-breasted Sapsucker	*Sphyrapicus ruber*
Williamson's Sapsucker	*Sphyrapicus thyroideus*
Pine Siskin	*Spinus pinus*
Brewer's Sparrow	*Spizella breweri*
Chipping Sparrow	*Spizella passerina*
Great Gray Owl	*Strix nebulosa*
Western Meadowlark	*Sturnella neglecta*
Red-eyed Vireo	*Vireo olivaceus*
Fish (5)	
Mountain sucker	*Catostomus platyrhynchus*
Pacific lamprey	*Entosphenus tridentatus*
Westslope cutthroat trout	*Oncorhynchus clarkii lewisi*
Or Grt Basin Redband trout pop 18	*Oncorhynchus mykiss*
Inland Columbia Basin redband trout	*Oncorhynchus mykiss gairdneri*
Mammals (13)	
Pygmy rabbit	*Brachylagus idahoensis*
Gray wolf[1]	*Canis lupus*
Townsend's big-eared bat	*Corynorhinus townsendii*

Northern flying squirrel	*Glaucomys sabrinus*
Silver-haired bat	*Lasionycteris noctivagans*
Hoary bat	*Lasiurus cinereus*
California myotis	*Myotis californicus*
Little Brown myotis	*Myotis lucifugus*
Fringed myotis	*Myotis thysanodes*
Long-legged myotis	*Myotis volans*
American pika	*Ochotona princeps*
Bighorn sheep[2]	*Ovis canadensis*
Preble's shrew	*Sorex preblei*
Reptiles (1)	
Rubber boa	*Charina bottae*

[1]East of Hwy. 395 only; wolves are Federally Endangered west of Hwy. 395

[2]Includes Rocky Mountain, Desert, and possibly California subspecies

Appendix 2. Potential Species of Conservation Concern – Umatilla National Forest

Bryophytes (5)		
liverwort	*Harpanthus flotovianus*	HAFL9
liverwort	*Lophozia gillmanii*	LOGI3
liverwort	*Ptilidium pulcherrimum*	PTPU2
Moss	*Ptilium crista-castrensis*	PTCR70
moss	*Tortula mucronifolia*	TOMU70
Fungi (9)		
	Albatrellus avellaneus	ALAV
	Albatrellus flettii	ALFL6
	Boletus pulcherrimus	BOPU4
	Catathelasma ventricosa	CAVE23
	Ramaria coulterae	RACO18
	Ramaria rubrievanescens	RARU5
	Ramaria rubripermanens	RARU6
	Rhizopogon evadens var. subalpinus	RHEVS
	Sclerotinia veratri	SCVE11
Lichens (6)		
	Chaenotheca chrysocephala	CHCH14
	Chaenotheca subroscida	CHSU14
	Collema curtisporum	COCU5
	Hypogymnia tuckerae	
	Scytinium quadrifidum	COQU
	Scytinium teretiusculum	LETE13
Vascular Plants (76)		
Aleutian Maidenhair Fern	*Adiantum pedatum*	ADPE
Sierra onion	*Allium campanulatum*	ALCA2
Blue mountain onion	*Allium dictuon*	ALDI3
Meadow pussy-toes	*Antennaria corymbosa*	ANCO
Narrowleaf milkweed	*Asclepias fascicularis*	
Showy milkweed	*Asclepias speciosa*	
Arthur's milk-vetch	*Astragalus arthurii*	ASAR8
Cusick's milk-vetch	*Astragalus cusickii var. cusickii*	ASCUC2
Transparent milk-vetch	*Astragalus diaphanus var. diaphanus*	ASDI2
Pauper milk-vetch	*Astragalus misellus var. misellus*	ASMIM3
Davidson's rockcress	*Boechera davidsonii*	BODA3
Oregon bolandra	*Bolandra oregana*	BOOR
Crenulate moonwort	*Botrychium crenulatum*	BOCR
Western moonwort	*Botrychium hesperium*	BOHE5
Moonwort	*Botrychium lunaria*	BOLU

Gray moonwort	*Botrychium minganense*	BOMI
Mountain grape-fern	*Botrychium montanum*	BOMO
Twin-spiked moonwart	*Botrychium paradoxum*	BOPA9
Stalked moonwort	*Botrychium pedunculosum*	BOPE4
Rattlesnake fern	*Botrypus virginianus*	
Tweedy's reedgrass	*Calamagrostis tweedyi*	CATW
long-bearded mariposa-lily	*Calochortus longebarbatus var. longebarbatus*	CALOL
green-band mariposa-lily	*Calochortus macrocarpus var. maculosus*	CAMAM
Holmgren's bittercress	*Cardamine holmgrenii*	Not in database
Cordilleran sedge	*Carex cordillerana*	CACO81
Russet sedge	*Carex saxatilis*	CASA10
Cusick's paintbrush	*Castilleja cusickii*	CACU7
Sticky paintbrush	*Castilleja viscidula*	CAVI9
Clearwater cryptantha	*Cryptantha grandiflora*	CRGR7
Pine woods cryptantha	*Cryptantha simulans*	CRSI2
American dragonhead	*Dracocephalum parviflorum*	DRPA2
Bolander's spikerush	*Eleocharis bolanderi*	ELBO
Swamp willow-herb	*Epilobium palustre*	EPPA
giant helleborine	*Epipactis gigantea*	EPGI
White cushion erigeron	*Erigeron disparipilus*	ERDI3
hairy sweetgrass	*Hierochloe odorata*	HIOD2
Rydberg's gilia	*Ipomopsis tenuituba*	IPTE4
Midget quillwort	*Isoetes minima*	ISMI4
Dwarf rush	*Juncus hemiendytus var. hemiendytus*	JUHEH
Howell's rush	*Juncus howellii*	JUHO
Kellogg's rush	*Juncus kelloggii*	JUKE
Northern twayblade	*Listera borealis*	LIBO4
Meadow lomatium	*Lomatium pastorale*	LOPA8
Rollins' lomatium	*Lomatium rollinsii*	LORO2
Spider biscuitroot	*Lomatium tarantuloides*	LOTA4
Cusick's lupine	*Lupinus lepidus var. cusickii*	LULEC7
Sabin's lupine	*Lupinus sabinianus*	LUSA3
Smith's melicgrass	*Melica smithii*	MESM
Washington Monkeyflower	*Mimulus washingtonensis var. washingtonensis*	Not in database
Marsh muhly	*Muhlenbergia glomerata*	MUGL3
Woodland beard tongue	*Nothochelone nemorosa*	NONE3
Devilsclub	*Oplopanax horridus*	OPHO
Bridges' cliff-brake	*Pellaea bridgesii*	PEBR5
Variable hot-rock penstemon	*Penstemon deustus var. variabilis*	PEDEV2
Blue Mountain penstemon	*Penstemon pennellianus*	PEPE11

Wilcox's penstemon	*Penstemon wilcoxii*	PEWI
Dotted smartweed	*Persicaria punctata*	PEPU18
Austin's knotweed	*Polygonum austiniae*	POAU2
Lemmon's hollyfern	*Polystichum lemmonii*	POLE5
common sword fern	*Polystichum munitum*	POMU
White-stem pondweed	*Potamogeton praelongus*	POPR5
Flatleaf pondweed	*Potamogeton robbinsii*	PORO2
Darrach's cinquefoil	*Potentilla versicolor var. darrachii*	Not in database
Rough pyrrocoma	*Pyrrocoma scaberula*	PYSC4
Mountain buttercup	*Ranunculus populago*	RAPO
Alpine sedum	*Rhodiola integrifolia ssp. integrifolia*	RHINI
wax currant	*Ribes cereum var. colubrinum*	RICEC
idaho gooseberry	*Ribes oxyacanthoides ssp. irriguum*	RIOXI
Columbia cress	*Rorippa columbiae*	ROCO3
forest scurfpea	*Rupertia physodes*	RUPH3
Farr's willow	*Salix farriae*	SAFA
prairie cordgrass	*Spartina pectinata*	SPPE
deer fern	*Struthiopteris spicant*	BLSP
Swertia	*Swertia perennis*	SWPE
Arrow-leaf thelypody	*Thelypodium eucosmum*	THEU
Douglas' clover	*Trifolium douglasii*	TRDO
Plumed clover	*Trifolium plumosum ssp. plumosum*	TRPLP
Invertebrates (17)		
California floater	*Anodonta californiensis*	
Yellow bumblebee	*Bombus fervidus*	
Morrison bumble bee	*Bombus morrisoni*	
Western bumblebee	*Bombus occidentalis*	
Suckley cuckoo bumble bee	*Bombus suckleyi*	
Columbia Gorge oregonian	*Cryptomastix hendersoni*	
Western ridged mussel	*Gonidea angulata*	
Umatilla megomphix	*Megomphix lutarius*	
Peck's skipper	*Polites peckius / Polites coras*	
Humped coin	*Polygyrella polygyrella*	
Crater Lake tightcoil	*Pristiloma crateris*	
Thinlip tightcoil	*Pristiloma idahoense*	
Shiny tightcoil	*Pristiloma wascoense*	
Pristine springsnail	*Pristinicola hemphilli*	
Fir pinwheel	*Radiodiscus abietum*	
Mann's mollusk-eating ground beetle	*Scaphinotus mannii*	
Great basin fritillary	*Speyeria egleis / Argynnis egleis*	
Amphibians (3)		

Western toad	*Anaxyrus boreas*
Rocky mountain tailed frog	*Ascaphus montanus*
Columbia spotted frog	*Rana luteiventris*
Birds (59)	
American goshawk	*Accipiter atricapillus* (formerly *Accipiter gentilis*)
Western Grebe	*Aechmophorus occidentalis*
Boreal Owl	*Aegolius funereus*
Grasshopper Sparrow	*Ammodramus savannarum*
Sandhill Crane	*Antigone canadensis* (formerly *Grus canadensis*)
Golden Eagle	*Aquila chrysaetos*
Short-eared Owl	*Asio flammeus*
Long-eared Owl	*Asio otus*
Bufflehead	*Bucephala albeola*
Swainson's Hawk	*Buteo swainsoni*
Wilson's Warbler	*Cardellina pusilla*
Vaux's Swift	*Chaetura vauxi*
Common Nighthawk	*Chordeiles minor*
Evening Grosbeak	*Coccothraustes vespertinus*
Olive-sided Flycatcher	*Contopus cooperi*
Western Wood-Pewee	*Contopus sordidulus*
Dusky Grouse	*Dendragapus obscurus*
Bobolink	*Dolichonyx oryzivorus*
White-headed Woodpecker	*Dryobates albolarvatus* (formerly *Picoides albolarvatus*)
Pileated Woodpecker	*Dryocopus pileatus*
Cordilleran Flycatcher	*Empidonax occidentalis*
Willow Flycatcher	*Empidonax traillii*
Gray Flycatcher	*Empidonax wrightii*
Peregrine Falcon	*Falco peregrinus*
Cassin's Finch	*Haemorhous cassinii*
Bald Eagle	*Haliaeetus leucocephalus*
Yellow-breasted Chat	*Icteria virens*
Varied Thrush	*Ixoreus naevius*
Belted Kingfisher	*Megaceryle alcyon*
Lewis's Woodpecker	*Melanerpes lewis*
Long-billed Curlew	*Numenius americanus*
Mountain Quail	*Oreortyx pictus*
Sage Thrasher	*Oreoscoptes montanus*
American White Pelican	*Pelecanus erythrorhynchos*
Black-backed Woodpecker	*Picoides arcticus*
American Three-toed Woodpecker	*Picoides dorsalis* (formerly *Picoides tridactylus*)
Pine Grosbeak	*Pinicola enucleator*
Green-tailed Towhee	*Pipilo chlorurus*

Horned Grebe	*Podiceps auritus*
Eared Grebe	*Podiceps nigricollis*
Mountain Chickadee	*Poecile gambeli*
Flammulated Owl	*Psiloscops flammeolus*
Golden-crowned Kinglet	*Regulus satrapa*
Calliope Hummingbird	*Selasphorus calliope*
Rufous Hummingbird	*Selasphorus rufus*
Townsend's Warbler	*Setophaga townsendi*
Western Bluebird	*Sialia mexicana*
Pygmy Nuthatch	*Sitta pygmaea*
Cinnamon Teal	*Spatula cyanoptera*
Red-naped Sapsucker	*Sphyrapicus nuchalis*
Red-breasted Sapsucker	*Sphyrapicus ruber*
Williamson's Sapsucker	*Sphyrapicus thyroideus*
Pine Siskin	*Spinus pinus*
Brewer's Sparrow	*Spizella breweri*
Chipping Sparrow	*Spizella passerina*
Great Gray Owl	*Strix nebulosa*
Western Meadowlark	*Sturnella neglecta*
Columbian Sharp-tailed Grouse	*Tympanuchus phasianellus columbianus*
Red-eyed Vireo	*Vireo olivaceus*
Fish (5)	
Mountain sucker	*Catostomus platyrhynchus*
Margined sculpin	*Cottus marginatus*
Pacific lamprey	*Entosphenus tridentatus*
Inland Columbia Basin redband trout	*Oncorhynchus mykiss gairdneri*
Chinook Salmon (non-ESA listed Middle Columbia, spring)	*Oncorhynchus tshawytscha*
Mammals (14)	
Pallid bat	*Antrozous pallidus*
Gray wolf[1]	*Canis lupus*
Townsend's big-eared bat	*Corynorhinus townsendii*
Spotted bat	*Euderma maculatum*
Northern flying squirrel	*Glaucomys sabrinus*
Silver-haired bat	*Lasionycteris noctivagans*
Hoary bat	*Lasiurus cinereus*
California myotis	*Myotis californicus*
Little Brown myotis	*Myotis lucifugus*
Fringed myotis	*Myotis thysanodes*
Long-legged myotis	*Myotis volans*
American pika	*Ochotona princeps*
Bighorn sheep[2]	*Ovis canadensis*

Preble's shrew	*Sorex preblei*
Reptiles (2)	
Rubber boa	*Charina bottae*
Painted turtle	*Chrysemys picta*

[1]East of Hwy. 395 only; wolves are Federally Endangered West of Hwy. 395

[2]Includes Rocky Mountain, Desert, and possibly California subspecies

Appendix 3. Potential Species of Conservation Concern – Wallowa-Whitman National Forest

Bryophytes (8)		
liverwort	*Barbilophozia lycopodioides*	BALY
liverwort	*Harpanthus flotovianus*	HAFL9
liverwort	*Jungermannia polaris*	JUPO3
liverwort	*Lophozia gillmanii*	LOGI3
liverwort	*Peltolepis quadrata*	PEQU7
liverwort	*Preissia quadrata*	PRQU2
liverwort	*Ptilidium pulcherrimum*	PTPU2
moss	*Schistidium cinclidodonteum*	SCCI5
Fungi (7)		
	Albatrellus avellaneus	ALAV
	Arrhenia lobata	ARLO15
	Cantharellus subalbidus	CASU63
	Polyozellus atrolazulinus	POMU12
	Polyozellus multiplex	POMU12
	Rhizopogon rogersii	RHRO10
	Rhizopogon subclavitisporus	RHSU17
Lichens (8)		
	Collema curtisporum	COCU5
	Dermatocarpon polyphyllizum	DEPO6
	Evernia divaricata	EVDI
	Syctinium teretiusculum	LETE13
	Peltigera cinnamomea	PECI12
	Peltigera lepidophora	PELE60
	Solorina spongiosa	SOSP60
	Tholurna dissimilis	THDI5
Vascular Plants (142)		
Nevada needlegrass	*Achnatherum nevadense*	ACNE10
Pinewoods needlegrass	*Achnatherum pinetorum*	ACPI2
Richardson's ricegrass	*Achnatherum richardsonii*	ACRI8
Wallowa ricegrass	*Achnatherum wallowaense*	ACWA
Aleutian Maidenhair Fern	*Adiantum pedatum*	ADPE
Sierra onion	*Allium campanulatum*	ALCA2
Geyer's onion	*Allium geyeri var. geyeri*	ALGEG
Dotted onion	*Allium punctum*	ALPU
Meadow pussy-toes	*Antennaria corymbosa*	ANCO
Cross-haired rockcress	*Arabis crucisetosa*	ARCR
Davis's milkweed	*Asclepias cryptoceras ssp. davisii*	ASCRD2
Narrowleaf milkweed	*Asclepias fascicularis*	ASFA

Showy milkweed	*Asclepias speciosa*	ASSP
Green spleenwort	*Asplenium viride*	ASVI10
Arthur's milk-vetch	*Astragalus arthurii*	ASAR8
Cusick's milk-vetch	*Astragalus cusickii var. cusickii*	ASCUC2
Wallowa milk-vetch	*Astragalus robbinsii var. alpiniformis*	ASROA
Davidson's rockcress	*Boechera davidsonii*	BODA3
Hells canyon rockcress	*Boechera hastatula*	BOHA3
Oregon bolandra	*Bolandra oregana*	BOOR
Upward-lobed moonwort	*Botrychium ascendens*	BOAS2
Prairie moonwort	*Botrychium campestre*	BOCA5
Crenulate moonwort	*Botrychium crenulatum*	BOCR
Western moonwort	*Botrychium hesperium*	BOHE5
Slender moonwort	*Botrychium lineare*	BOLI7
Moonwort	*Botrychium lunaria*	BOLU
Gray moonwort	*Botrychium minganense*	BOMI
Mountain grape-fern	*Botrychium montanum*	BOMO
Twin-spiked moonwart	*Botrychium paradoxum*	BOPA9
Stalked moonwort	*Botrychium pedunculosum*	BOPE4
Rattlesnake fern	*Botrypus virginianus*	BOVI8
Bupleurum	*Bupleurum americanum*	BUAM2
green-band mariposa-lily	*Calochortus macrocarpus var. maculosus*	CAMAM
Holmgren's bittercress	*Cardamine holmgrenii*	Not in database
Blackened sedge	*Carex atrosquama*	CAAT8
Hairlike sedge	*Carex capillaris*	CACA12
Low northern sedge	*Carex concinna*	CACO10
Cordilleran sedge	*Carex cordillerana*	CACO81
Different nerve sedge	*Carex heteroneura var. epapillosa*	CAHEE
Slender sedge	*Carex lasiocarpa var.americana*	CALAA
Poor sedge	*Carex magellanica ssp. irrigua*	CAMAI2
Intermediate sedge	*Carex media*	CAME9
Pyrenaean sedge	*Carex micropoda*	CAMI16
Spikenard sedge	*Carex nardina*	CANA2
New sedge	*Carex pelocarpa*	CAPE5
Teacher's sedge	*Carex praeceptorum*	CAPR22
Retrorse sedge	*Carex retrorsa*	CARE4
Russet sedge	*Carex saxatilis*	CASA10
Dark alpine sedge	*Carex subnigricans*	CASU7
Tahoe sedge	*Carex tahoensis*	CATA
Native sedge	*Carex vernacula*	CAVE5
Cusick's paintbrush	*Castilleja cusickii*	CACU7
Rural paintbrush	*Castilleja flava var. rustica*	CAFLR
Fraternal paintbrush	*Castilleja fraterna*	CAFR8

Purple alpine paintbrush	*Castilleja rubida*	CARU8
Sticky paintbrush	*Castilleja viscidula*	CAVI9
Fee's lip-fern	*Cheilanthes feei*	CHFE
Spearhead	*Chlorocrambe hastata*	CHHA
Pine woods cryptantha	*Cryptantha simulans*	CRSI2
Steller's rockbrake	*Cryptogramma stelleri*	CRST2
A cyperus	*Cyperus lupulinus ssp. lupulinus*	CYLUL
Clustered lady's-slipper	*Cypripedium fasciculatum*	CYFA
Wallowa draba	*Draba cyclomorpha*	Not in database
American dragonhead	*Dracocephalum parviflorum*	DRPA2
Bolander's spikerush	*Eleocharis bolanderi*	ELBO
giant helleborine	*Epipactis gigantea*	
Engelmann's daisy	*Erigeron davisii*	ERDA3
White cushion erigeron	*Erigeron disparipilus*	ERDI3
Cliff buckwheat	*Eriogonum scopulorum*	ERSC5
Thyme-leaved buckwheat	*Eriogonum thymoides*	ERTH4
Membrane-leaved monkeyflower	*Erythranthe hymenophylla*	ERHY6
Stalk-leaved monkeyflower	*Erythranthe patula*	ERPA16
Arctic aster	*Eurybia merita*	EUME17
Slender-stemmed avens	*Geum rossii var. turbinatum*	GEROT
hairy sweetgrass	*Hierochloe odorata*	HIOD2
Rydberg's gilia	*Ipomopsis tenuituba*	IPTE4
Midget quillwort	*Isoetes minima*	ISMI4
Dwarf rush	*Juncus hemiendytus var. hemiendytus*	JUHEH
Howell's rush	*Juncus howellii*	JUHO
Three-flowered rush	*Juncus triglumis var. albescens*	JUTRA2
Bellard's kobresia	*Kobresia myosuroides*	KOMY
Simple kobresia	*Kobresia simpliciuscula*	KOSI2
Aristulate lipocarpha	*Lipocarpha aristulata*	LIAR6
Northern twayblade	*Listera borealis*	LIBO4
Red-fruited lomatium	*Lomatium erythrocarpum*	LOER2
Basalt desert parsley	*Lomatium filicinum*	Not in database
Greenman's desert parsley	*Lomatium greenmanii*	LOGR2
Meadow lomatium	*Lomatium pastorale*	LOPA8
Rollins' lomatium	*Lomatium rollinsii*	LORO2
Snake canyon desert parsley	*Lomatium serpentinum*	LOSE2
Sabin's lupine	*Lupinus sabinianus*	LUSA3
Sierra woodrush	*Luzula orestera*	LUOR4
Ground cedar	*Lycopodium complanatum*	LYCO3
Cespitose evening primrose	*Oenothera caespitosa ssp caespitosa*	OECAC2
Tufted evening primrose	*Oenothera caespitosa ssp. marginata*	OECAM4

Adder's-tongue	*Ophioglossum pusillum*	OPPU3
Sticky crazyweed	*Oxytropis borealis var. viscida*	OXBOV
Snowball cactus	*Pediocactus nigrispinus*	PENI5
Sierra cliffbrake	*Pellaea brachyptera*	PEBR3
Brewer's cliff-brake	*Pellaea breweri*	PEBR4
Bridges' cliff-brake	*Pellaea bridgesii*	PEBR5
Variable hot-rock penstemon	*Penstemon deustus var. variabilis*	PEDEV2
Blue Mountain penstemon	*Penstemon pennellianus*	PEPE11
Wilcox's penstemon	*Penstemon wilcoxii*	PEWI
Dwarf phacelia	*Phacelia minutissima*	PHMI7
Soft phlox	*Phlox mollis*	PHMO6
Many-flowered phlox	*Phlox multiflora*	PHMU3
Limber pine	*Pinus flexilis*	PIFL2
Little ricegrass	*Piptatheropsis exigua*	PIEX4
Small northern bog-orchid	*Platanthera obtusata*	PLOB
Nodding bluegrass	*Poa reflexa*	PORE
	Poa wallowensis	
Skunk polemonium	*Polemonium viscosum*	POVI
Austin's knotweed	*Polygonum austiniae*	POAU2
Parry's knotweed	*Polygonum parryi*	POPA8
Water knotweed	*Polygonum polygaloides ssp. esotericum*	POPOE
common sword fern	*Polystichum munitum*	POMU
White-stem pondweed	*Potamogeton praelongus*	POPR5
Darrach's cinquefoil	*Potentilla versicolor var. darrachii*	Not in database
Cusick's primrose	*Primula cusickiana*	PRCU2
Rough pyrrocoma	*Pyrrocoma scaberula*	PYSC4
Mountain buttercup	*Ranunculus populago*	RAPO
Alpine sedum	*Rhodiola integrifolia ssp. integrifolia*	RHINI
wax currant	*Ribes cereum var. colubrinum*	RICEC
idaho gooseberry	*Ribes oxyacanthoides ssp. irriguum*	RIOXI
Bartonberry	*Rubus bartonianus*	RUBA
Farr's willow	*Salix farriae*	SAFA
Snow willow	*Salix nivalis*	SANI8
Wolf's willow	*Salix wolfii*	SAWO
Wedge-leaf saxifrage	*Saxifraga adscendens ssp. oregonensis*	SAADO2
Mountain-marsh butterweed	*Senecio sphaerocephalus*	SESP4
Spalding's campion	*Silene spaldingii*	SISP2
prairie cordgrass	*Spartina pectinata*	SPPE
Northern slender-leaved pondweed	*Stuckenia filiformis ssp. alpina*	STFIA2
Swertia	*Swertia perennis*	SWPE
Alpine meadowrue	*Thalictrum alpinum*	THAL

Mountain townsendia	*Townsendia montana*	TOMO
Parry's townsendia	*Townsendia parryi*	TOPA2
Douglas' clover	*Trifolium douglasii*	TRDO
American globeflower	*Trollius albiflorus*	TRLAA2
Lesser bladderwort	*Utricularia minor*	UTMI
Invertebrates (22)		
Leaf cutter bee	*Ashmeadiella sculleni*	
Yellow bumblebee	*Bombus fervidus*	
Morrison bumble bee	*Bombus morrisoni*	
Western bumblebee	*Bombus occidentalis*	
Suckley cuckoo bumble bee	*Bombus suckleyi*	
Johnson's hairstreak	*Callophrys johnsoni*	
Intermountain sulphur	*Colias occidentalis pseudochristina /Colias christina pseudochristina*	
Columbia Gorge oregonian	*Cryptomastix hendersoni*	
Disc oregonian	*Cryptomastix sanburni*	
Gillette's checkerspot	*Euphydryas gillettii*	
Shortface lanx	*Fisherola nuttalli*	
Columbia pebblesnail (Ashy pebblesnail)	*Fluminicola fuscus*	
Western ridged mussel	*Gonidea angulata*	
Umatilla megomphix	*Megomphix lutarius*	
Yuma skipper	*Ochlodes yuma*	
Peck's skipper	*Polites peckius / Polites coras*	
Thinlip tightcoil	*Pristiloma idahoense*	
Shiny tightcoil	*Pristiloma wascoense*	
Pristine springsnail	*Pristinicola hemphilli*	
Fir pinwheel	*Radiodiscus abietum*	
Great basin fritillary	*Speyeria egleis / Argynnis egleis*	
A freshwater snail	*Taylorconcha insperata*	
Amphibians (3)		
Western toad	*Anaxyrus boreas*	
Rocky mountain tailed frog	*Ascaphus montanus*	
Columbia spotted frog	*Rana luteiventris*	
Birds (70)		
American Goshawk	*Accipiter atricapillus* (formerly *Accipiter gentilis*)	
Western Grebe	*Aechmophorus occidentalis*	
Boreal Owl	*Aegolius funereus*	
Grasshopper Sparrow	*Ammodramus savannarum*	
Sandhill Crane	*Antigone canadensis* (formerly *Grus canadensis*)	
Golden Eagle	*Aquila chrysaetos*	
Short-eared Owl	*Asio flammeus*	
Long-eared Owl	*Asio otus*	

Upland Sandpiper	*Bartramia longicauda*
Bufflehead	*Bucephala albeola*
Ferruginous Hawk	*Buteo regalis*
Swainson's Hawk	*Buteo swainsoni*
Spruce Grouse	*Canachites canadensis*
Wilson's Warbler	*Cardellina pusilla*
Greater Sage-Grouse	*Centrocercus urophasianus*
Vaux's Swift	*Chaetura vauxi*
Common Nighthawk	*Chordeiles minor*
Evening Grosbeak	*Coccothraustes vespertinus*
Olive-sided Flycatcher	*Contopus cooperi*
Western Wood-Pewee	*Contopus sordidulus*
Black Swift	*Cypseloides niger*
Dusky Grouse	*Dendragapus obscurus*
Bobolink	*Dolichonyx oryzivorus*
White-headed Woodpecker	*Dryobates albolarvatus* (formerly *Picoides albolarvatus*)
Pileated Woodpecker	*Dryocopus pileatus*
Cordilleran Flycatcher	*Empidonax occidentalis*
Willow Flycatcher	*Empidonax traillii*
Gray Flycatcher	*Empidonax wrightii*
Peregrine Falcon	*Falco peregrinus*
Cassin's Finch	*Haemorhous cassinii*
Bald Eagle	*Haliaeetus leucocephalus*
Harlequin Duck	*Histrionicus histrionicus*
Yellow-breasted Chat	*Icteria virens*
Varied Thrush	*Ixoreus naevius*
Loggerhead Shrike	*Lanius ludovicianus*
Franklin's Gull	*Leucophaeus pipixcan*
Black Rosy Finch	*Leucosticte atrata*
Wallowa Rosy Finch	*Leucosticte tephrocotis wallowa*
Belted Kingfisher	*Megaceryle alcyon*
Lewis's Woodpecker	*Melanerpes lewis*
Long-billed Curlew	*Numenius americanus*
Mountain Quail	*Oreortyx pictus*
Sage Thrasher	*Oreoscoptes montanus*
American White Pelican	*Pelecanus erythrorhynchos*
Black-backed Woodpecker	*Picoides arcticus*
American Three-toed Woodpecker	*Picoides dorsalis* (formerly *Picoides tridactylus*)
Pine Grosbeak	*Pinicola enucleator*
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Pine Siskin	*Spinus pinus*
Brewer's Sparrow	*Spizella breweri*
Chipping Sparrow	*Spizella passerina*
Great Gray Owl	*Strix nebulosa*
Western Meadowlark	*Sturnella neglecta*
Lesser Yellowlegs	*Tringa flavipes*
Columbian Sharp-tailed Grouse	*Tympanuchus phasianellus columbianus*
Red-eyed Vireo	*Vireo olivaceus*
Fish (3)	
White sturgeon	*Acipenser transmontanus*
Pacific lamprey	*Entosphenus tridentatus*
Inland Columbia Basin redband trout	*Oncorhynchus mykiss gairdneri*
Mammals (14)	
Gray wolf[1]	*Canis lupus*
Townsend's big-eared bat	*Corynorhinus townsendii*
Spotted bat	*Euderma maculatum*
Northern flying squirrel	*Glaucomys sabrinus*
Silver-haired bat	*Lasionycteris noctivagans*
Hoary bat	*Lasiurus cinereus*
White-tailed jackrabbit	*Lepus townsendii*
California myotis	*Myotis californicus*
Little Brown myotis	*Myotis lucifugus*
Fringed myotis	*Myotis thysanodes*
Long-legged myotis	*Myotis volans*
American pika	*Ochotona princeps*
Bighorn sheep[2]	*Ovis canadensis*
Preble's shrew	*Sorex preblei*
Reptiles (1)	
Rubber boa	*Charina bottae*

[1]Wolves are only Federally Endangered West of Hwy. 395; all gray wolves on WAW are delisted.

[2]Includes all subspecies