

## Botanical Resources

### Affected Environment (Habitat and Species)

National Forest System lands in the Pacific Northwest Region of the Forest Service occupy approximately 25 percent of the land area in Oregon and Washington (about 25,000,000 acres), and are distributed across all ecoregions in the region. Ecoregions are areas of similar climate, vegetation, and ecological processes that tend to share plant and animal species within their boundaries, and differ consistently in that manner from adjacent ecoregions. Prominent in Oregon and Washington are:

- the wetter systems of the West Cascade ecoregion,
- the dry forest types of the East Cascades and Blue Mountains ecoregions (the latter with limestone edaphic endemics among many other rare plants),
- the mild climate and outstanding conifer growing landscape of the North Coast Ecoregion,
- the geologically complex and often serpentinite Klamath Ecoregion of southwestern Oregon, and
- the broad Columbia Plateau with its bitterbrush and bunchgrass high deserts east of the Cascades.

Because of this rich mixture of ecological systems and soil types, the Pacific Northwest is home to many rare and endangered plants and plant allies: vascular plants, bryophytes (mosses), liverworts and hornworts, fungi, and lichens, all collectively hereafter called “plants”). National Forest System lands in the Pacific Northwest Region have a number of prominent centers of plant endemism. Preeminent among these is the Klamath ecoregion, which contains one of the richest floras in the nation (Smith and Sawyer 1988) and is home to hundreds of endemic plant species, many with very limited distributions and very small populations. Well-known plants there include Port Orford cedar (*Chamaecyparis lawsoniana*) and the spectacular semi-endemic California pitcher plant (*Darlingtonia*). The Blue Mountains and East Cascades also harbor a large endemic plant contingent, though indeed endemics are to be found in every Pacific Northwest ecoregion.

The National Forest System lands of this region have many rare and special plant species that are designated by the Regional Forester as sensitive for management purposes. The 2018 Regional Forester sensitive species list (USDA Forest Service 2018) has 490 sensitive plant species including 387 vascular plants, 49 bryophytes, 28 fungi, and 26 lichens. Our overall responsibility for these species is to ensure that management actions do not contribute to a loss of viability of species or populations, or cause a trend toward Endangered Species Act federal listing (USDA Forest Service 2005). Because federally listed species are addressed under ARBO II (U.S. Fish and Wildlife Service 2013), they are not discussed further here.

The analysis area for botany is water and the land within 300 feet of it, since this corresponds roughly to the area of riparian reserves (USDA and USDI 1994) and riparian habitat conservation areas (USDA and USDI 1995a, 1995b) where project activities will occur. (Since these two land allocations are not carefully mapped across the region, it was not possible to use these actual areas for analysis.) In this project we expect up to 470 nonsystem roads to be decommissioned outside the riparian corridor (see Proposed Actions: *Project Number and Occurrences*), but the presence of rare plants in these highly disturbed road prisms is unlikely so there would be no

impact on botanical resources in these areas. Because nonsystem roads are usually not mapped and we do not know which roads will be decommissioned, they are not quantitatively analyzed or discussed in detail.

We used our corporate data systems (Natural Resource Management, Threatened Endangered Sensitive Plants or NRIS-TESP) to identify all known occurrences of sensitive plants within the project area, and found a high diversity of botanical resources that would potentially be affected by the project (see Appendix Botany). There are at least 339 sensitive plant species in the project area including 262 vascular plants, 39 bryophytes, 19 fungi, and 19 lichens. The number of known occurrences by species within the project area ranges from 1 to 11 across the region, and it is noteworthy that 220 (65 percent) of these taxa are represented across the entire region by only one known population in the project area. In addition to the 339 taxa with known locations in the Pacific Northwest Region, there are 21 plant taxa that will be sensitive on the new 2018 Regional Forester sensitive species list and cannot be excluded from this analysis based on their known habitats (we have not looked for them because they are newly designated as sensitive, so there are no confirmed localities on National Forest System lands in the project area. These 21 are also included in this analysis bringing the total number of taxa considered to 360 (283 vascular plants, 39 bryophytes, 19 fungi, and 19 lichens).

Many of these 360 sensitive plants are extremely rare or restricted in distribution, and it is essential that populations be safeguarded and habitat conditions be improved for these taxa. Forty-six are either globally critically imperiled (G1) or imperiled (G2) under the NatureServe conservation system, while an additional 284 are similarly ranked as critically imperiled or imperiled (S1 or S2) in the states of Oregon or Washington. While the law is clear that all sensitive species must be protected during project activities such that there is no loss of viability or trend toward federal listing (USDA Forest Service 2005), in practice consulting botanists apply the highest possible protection and restoration standards for taxa that are globally or state-imperiled with Nature Serve ranks of G1, G2, S1 or S2. That practice is expected to continue during the life of this project.

## **Issues for Analysis**

**Issue 1:** Degradation or elimination of rare plant populations or their habitat during riparian project activities.

**Description:** This project includes a broad range of habitat-altering activities that will ultimately improve riparian conditions (see Proposed Actions: *Types of Aquatic Restoration Proposed*); most of these activities provide long-term benefits in exchange for short-term impacts. The use of heavy equipment in riparian corridors—a feature of nearly all proposed project activities—is the primary concern for rare plants since most are small and easily crushed or obliterated by heavy wheeled and bladed vehicles. Also, any vegetation management for improved riparian function (e.g., riparian vegetation treatment and controlled burning) can remove habitat and eliminate arboreal taxa including lichens, bryophytes, and fungi. The overall objective of the project, however, is to improve aquatic and riparian function and biological diversity, while accepting that there may be temporary disruptions and degradation that will eventually give way to nature in a better place.

The success of this project is entirely dependent on the project design criteria that have been developed for all resources, especially for the protection and enhancement of botanical species and resources. Whereas ordinarily we conduct plant surveys in advance of designing a project to

mitigate and analyze impacts based on those surveys, this project authorizes post-decision/pre-implementation plant surveys. Since final project locations and activities will be flexibly determined in part based on project design criteria, these criteria must be the strongest possible to help identify the right scope, scale, mix, and mitigation of approved work following a signed decision. Strong project design criteria also ensure a more predictable project outcome, and this makes environmental analysis possible despite unknown project activity choices and locations. We developed the botany project design criteria with all this in mind.

## **Spatial and Temporal Boundaries**

Projects will mostly occur inside the riparian reserves and riparian habitat conservation areas in the national forests of the Pacific Northwest Region. Effects to rare plants and vegetation will generally occur within the 10- to 15-year project lifespan, though some indirect effects caused by vegetation management or habitat restoration for improved riparian function and biological diversity could take decades to reach equilibrium. Non-system road decommissioning will occur both within and outside riparian reserves and riparian habitat conservation areas, and habitat and ecological function should improve for decades following implementation.

## **Environmental Consequences Including Direct and Indirect Effects**

Although botanical project design criteria allow for limited short-term deleterious effects, the design criteria ensure there will be no long-term degradation of plant populations or their habitats during the life of this project. Project design criteria for plants address both direct and indirect potential impacts, avoiding them entirely or mitigating them to insignificance. In particular, the requirement for certified botanists to consult on project activities, the absolute necessity of avoidance of impacts as the mitigation of choice, the emphasis on habitat enhancement, and the considerations and requirements for maintenance or improvement of ecological site integrity for both rare plants and special habitats all ensure that projects will provide long-term benefits to rare plants in the national forest units of the region. Furthermore, 65 percent (220) of the sensitive plant taxa that occur within the region are only known from a single occurrence across the region, and given the dispersed nature and overall modest number of projects proposed (about 1,800 over 10 to 15 years), as well as the very small ground-disturbing footprint for most aquatic restoration activities (see Soils Resource Report, Table 1), it follows that most of the taxa analyzed here will not be encountered or affected by this project. However, given the uncertainty associated with post-decision rare plant surveys, lack of complete knowledge of rare plants and their distribution and abundance, unknown individual project activity locations, and the unpredictability of final implementation, we have reached a single effects determinations for all riparian plants considered in this analysis. We have determined that proposed activities may impact individuals and habitat, but would not likely contribute to a trend towards Federal listing or loss of viability to the population or species (table 1). There would be no short-term impacts associated with nonsystem road decommissioning in uplands since rare plants and unique habitats are extremely unlikely to be encountered, and active or passive restoration would improve habitat in the long run.

Despite anticipated occasional minor short-term impacts, the long-term outcome for plants under this project and its planned activities remains positive.

## Summary of Environmental Effects

**Table 1. Summary of environmental effects for Pacific Northwest Region aquatic restoration proposed action**

Area	Species	Status	Proposed Action Effects
Riparian reserves and riparian habitat conservation areas	All 360 sensitive plant species in the riparian project area (see Appendix Botany for full species listing)	Sensitive	<p><b>Long-term Beneficial Effects:</b> In the long term, restoration projects carried out would improve habitat condition at the site and watershed scale. While project focus is on improving aquatic and riparian function, the project design criteria for plants ensure that botanists will incorporate terrestrial habitat restoration where it is needed, thus improving rare plant population persistence and viability.</p> <p><b>Short-term Adverse Effects:</b> Short-term effects would be extremely rare since all rare plant populations would be avoided or impacts mitigated. Project design criteria dictate that indirect effects to sensitive plants will be fully evaluated and avoided to the greatest possible extent.</p> <p><b>Effects Determination:</b> Project activities may impact individuals or habitat, but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species.</p>
Uplands (nonsystem road decommissioning)	Unknown	Sensitive	<p><b>Long-term Beneficial Effects:</b> Eventually rare plants may recolonize some decommissioned roads so modest benefits may accrue.</p> <p><b>Short-term Adverse Effects:</b> None</p> <p><b>Effects Determination:</b> No Impact</p>

## Cumulative Effects

Past, present and reasonably foreseeable future actions that are especially relevant to plants include forest vegetation improvement and fuels reduction work, aquatic restoration, and grazing allotment reauthorization. Review of recent projects show that their effects determinations for plants range from beneficial impact to no impact or may impact individuals and habitats. Detrimental effects to rare plants described in project analyses can include the loss of some individuals due to ground disturbance or herbivory or trampling from livestock. Sensitive habitats such as soil crust or moss mats are vulnerable to disturbance and may take years or decades to recover. Certain special habitats like fens or aspen groves are degraded by livestock or changes in fire regimes. However, all projects employ avoidance as well as project design features to reduce or avoid direct effects to rare plants and special and unique habitats. Furthermore, detrimental effects for most projects are local and short term, and in most of this work botanical resources are left in the same condition upon project completion (table 2). For many regional projects, an effects determination of “may impact habitats or individuals” is concluded out of an abundance of caution or due to uncertainty (for example, where fungal surveys are impractical), yet generally long-term impacts to botanical resources are avoided even for these projects.

The determinations and outcomes for this regional aquatic restoration project are similar to most projects in the region where botanical resources are analyzed. Because we anticipate only long-

term neutral to potentially beneficial consequences for rare plants and their habitats from this proposed action, we anticipate negligible or mildly positive cumulative effects.

**Table 2. Recent regional projects that involve rare plants and habitats with descriptions and a summary of effects determinations**

<b>Project</b>	<b>Forest</b>	<b>Type</b>	<b>Year</b>	<b>NEPA Effects Determination or Outcome of Proposed Action on Plants</b>
Aquatic Restoration (forest-wide)	Malheur National Forest	Aquatic Restoration	2014	Depending on the species mostly long-term Beneficial Impact, some No Impact, a few May Impact Individuals or Habitat; no adverse cumulative effects.
Fox Canyon Cluster Grazing Authorization Project	Ochoco National Forest	Grazing Reauthorization	2013	May Impact Individuals or Habitat
Glass Project	Umatilla National Forest	Integrated Restoration	2018	Depending on the habitat either No Impact or May Impact Individuals or Habitat
Hamilton Creek Restoration	Columbia River Gorge National Scenic Area	Estuary Habitat Restoration	2017	No sensitive species found=No Impact
Hunter Integrated Resource Project	Mt. Hood National Forest	Integrated Restoration	2017	No sensitive species found=No Impact
Jude Ridge	Willamette National Forest	Integrated Restoration	2016	No Impact (most plants) or May Impact Individuals or Habitat (fungi).
Pumice Instream and Riparian Fish Habitat Improvement	Gifford Pinchot National Forest: Mt. St. Helens National Monument	Fish Habitat Improvement	2010	Survey for <i>Heterotheca oregona</i> and avoid=No Impact
Quartz Integrated Project	Umpqua National Forest	Integrated Restoration	2016	No Impact (most plants) or May Impact Individuals or Habitat (fungi).
Ursus Vegetation and Fuels Management Project	Deschutes National Forest	Integrated Restoration	2016	No sensitive species found=No Impact, except for whitebark pine= May Impact Individuals or Habitat

## Consistency Statement

This environmental assessment complies with all laws, regulations, and policy regarding management of botanical resources on National Forest System lands. This guidance includes:

- **National Forest Management Act of 1976.** The National Forest Management Act calls for the management of renewable resources on National Forest System lands and for the agency to “maintain viable populations of existing native and desired non-native vertebrate species in the planning area”.

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- **Forest Service Manual 2670**, Threatened, Endangered and Sensitive Plants and Animals (USDA Forest Service 2005). Requires (FSM 2670.32) that Forest Service management actions “must not result in loss of species viability or create significant trends toward Federal listing”.
- **Forest Land and Resource Management plans for all the National Forest System units in the Pacific Northwest Region.** These plans are consistent with Forest Service Manual 2670 and most of them have additional protections for Sensitive plant species. These additional protections are built into the project design criteria for plants.