Trout Lake Natural Area Preserve

MANAGEMENT PLAN

State of Washington Department of Natural Resources
Natural Areas Program

June 2026

Trout Lake NAP Management Plan
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Acknowledgements
Cover Photo: Trout Lake NAP, View of Mount Adams from the Interpretive Trail
Photo Credit: Karen Adams, DNR Natural Areas Program

State of Washington Department of Natural Resources

Management Plan for Trout Lake NAP

June 2026

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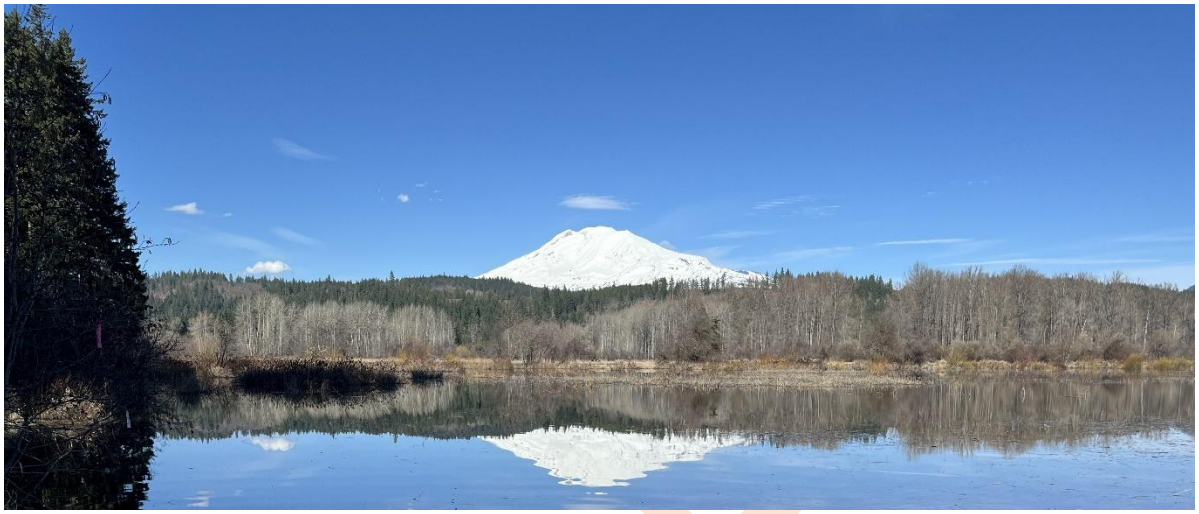
2026 Management Plan for Trout Lake NAP



Why Create a Management Plan for Trout Lake NAP?

The Trout Lake Natural Area Preserve (NAP) management plan provides functional guidelines for the site manager and other Washington State Department of Natural Resources (DNR) staff, as well as conservation information for partners, neighbors, interested parties and the public. This plan helps to identify priorities for management of natural features and access at the site. The plan demonstrates how DNR is applying statutory and policy requirements to specific management activities for the natural area. The management objectives, actions and provisions outlined in this plan apply only to the DNR-owned lands within the combined preserve and conservation area.

Oregon spotted frog (Photo credit: Natural Areas Program)

How Might the Management Plan Change Over Time?

Once approved by DNR, the plan guides future conservation land management actions within the Trout Lake NAP. This will be done in combination with any related implementation prescriptions or more detailed site inventory or analysis later adopted as appendices to this plan. Any changes in access at the Trout Lake NAP would involve a separate planning effort that includes additional analysis and outreach to the neighboring community and other interested parties.

Appendices 2 and 3 are a "living" work plan and cost summary that will be updated by DNR as changes arise with the routine management of the site and as projects are implemented or economic factors (such as inflation) cause changes. Future updates to Appendices 2 and 3 will be in conformance with the policy guidance and land management goals of the plan, including any future adopted appendices.

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Preface

Trout Lake Natural Area Preserve (NAP) encompasses a variety of ecosystems including forested, scrub shrub, and emergent wetlands, and riverine/riparian zones, all of which provide vital habitat for many wildlife species. The site occurs within one of six watersheds (HUC-10) where Oregon spotted frogs (*Rana pretiosa*), a federally threatened and state endangered species, occur in Washington. The Trout Lake NAP is one of six known areas in Washington where Sandhill Cranes (*Antigone canadensis tabida*) nest.

Trout Lake was designated in 1996 as a Natural Area Preserve (NAP) under Revised Code of Washington (RCW) Chapter 79.70, the Washington Natural Area Preserves Act. The NAP was designated to protect the following natural features: Oregon spotted frog (*Rana pretiosa*), Sandhill Crane (*Antigone canadensis tabida*), pale blue-eyed grass (*Sisyrinchium sarmentosum*), Pulsifer's monkeyflower (*Erythranth pulsiferae*), and Pileated Woodpecker (*Drycopus pileatus*) (DNR 1995).

Over 150 species of birds have been recorded on the site, including many neotropical migratory species of conservation concern. It is part of the Pacific Flyway, providing important feeding and resting habitat for migratory waterfowl.

Key management issues at the Trout Lake NAP include protecting primary features and managing public access. Included within this document is the policy and ecological context that underpins the management goals and actions.

The plan summarizes the resources needed to support active management of the site and includes a list of near-term projects being pursued during the upcoming State of Washington 2-year budget cycle. This project-specific and resource-specific information will be updated as funding becomes available for site management.

By the signatures on Page 3 of this document, this management plan is approved for implementation at the Trout Lake NAP. Additionally, the appendices, which hold the detailed implementation guidance and site-specific data, will be updated and new appendices created as additional information becomes available.

Glossary of Acronyms

BNSF	Burlington Northern Santa Fe (Railway)
CPL	Commissioner of Public Lands
DAHP	Department of Archaeological and Historic Preservation
DNR	Department of Natural Resources
EIA	Ecological Integrity Assessment
EO	Element Occurrence
GEO	Governors Executive Order
GMA	Growth Management Act
HCP	Habitat Conservation Plan
NAP	Natural Area Preserve
NRCA	Natural Resources Conservation Area
RCW	Revised Code of Washington
SEPA	State Environmental Protection Act
SMA	Special Management Areas
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WRIA	Watershed Resource Inventory Area
WWRP	Washington Wildlife and Recreation Program
YEOP	Youth Education and Outreach Program (DNR)

General Natural Area Information

Location of Trout Lake Natural Area Preserve (NAP)

The Trout Lake NAP is located approximately one mile northwest of the town of Trout Lake, situated 24 miles north of the city of White Salmon, all within the northwest corner of Klickitat County, Washington. (Figure 1, 2, 3).

The natural area preserve is located in:

T: R: S: Portions of Sections 8, 9, 10, 15 and 16, Township 6 North, Range 10 East, Willamette Meridian.

Quad: Trout Lake, WA, 7.5 minute Quadrangle Map (U.S.G.S 1994)
Ecoregion: East Cascades

Ecoregional Context:
The East Cascades Ecoregion (DNR 2025) extends from central Washington through Oregon, to northern California. In Washington, the ecoregion lies east of the Cascade crest, from just south of Wenatchee to the Columbia Gorge. Its eastern border follows the montane forest – lowland shrub-steppe transition. Approximately 10 percent of Washington (over 800 square miles) is included within this ecoregion (Washington Department of Fish and Wildlife 2005). The Cascade Mountains formed as a result of tectonic uplift, and the mountain ranges and valleys are oriented north-to-south (U.S. Environmental Protection Agency 2010). The East Cascades of Washington were subsequently shaped by glaciers and landslides that created the rugged ridges extending down from the crest. Broad valleys occupy the lowlands between the mountain ridges. There are isolated volcanic cones on the steep mountain ridges throughout the range in Washington, but with the exception of Mt. Adams are not as high as volcanoes in the Western Cascades (Washington Department of Fish and Wildlife 2005).

The Eastern Cascades Ecoregion lies within the rain shadow of the Cascade Range, and the average annual precipitation at Trout Lake NAP is 46 inches. Precipitation (both as rain and snow) falls mostly in the autumn, through winter into spring. Trout Lake Creek drains into the White Salmon River, and ultimately to the Columbia River. Spring-fed tributaries and snow melt provide most of the water to Trout Lake Creek, with overbank flow and direct precipitation contributing to the wetland complex as well (Sleeter et. al. 2012). Trout Lake NAP is 1,950 feet above sea level. Forest is the primary land cover in the Eastern Cascades Slopes and Foothills Ecoregion, and fire plays an important role in forest composition (Sleeter et. al. 2012).

Figure 1 Trout Lake NAP Ownership within the Approved Boundary

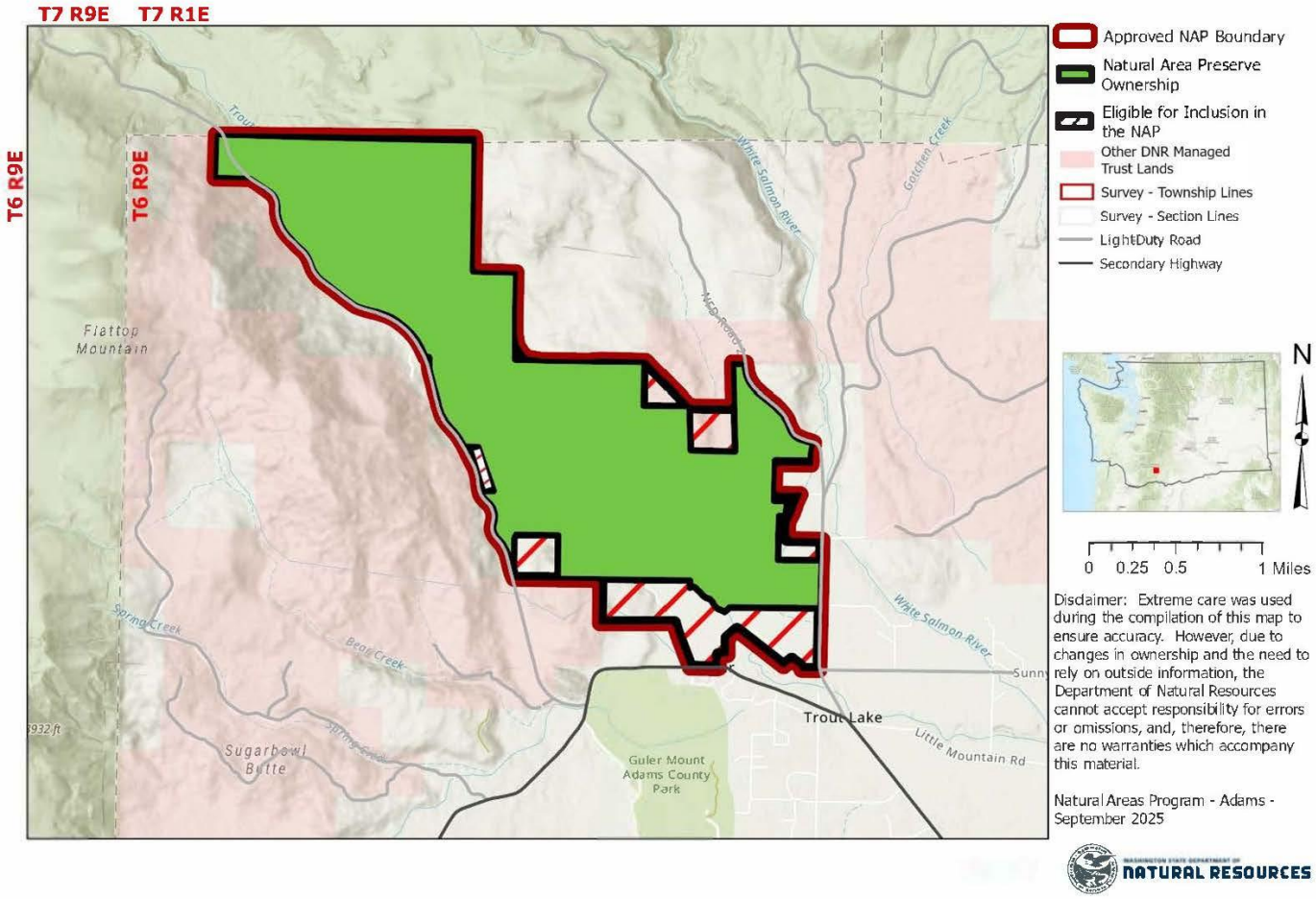


Figure 2 Landscape context and extent of rare plants contiguous with those protected in Trout Lake NAP.

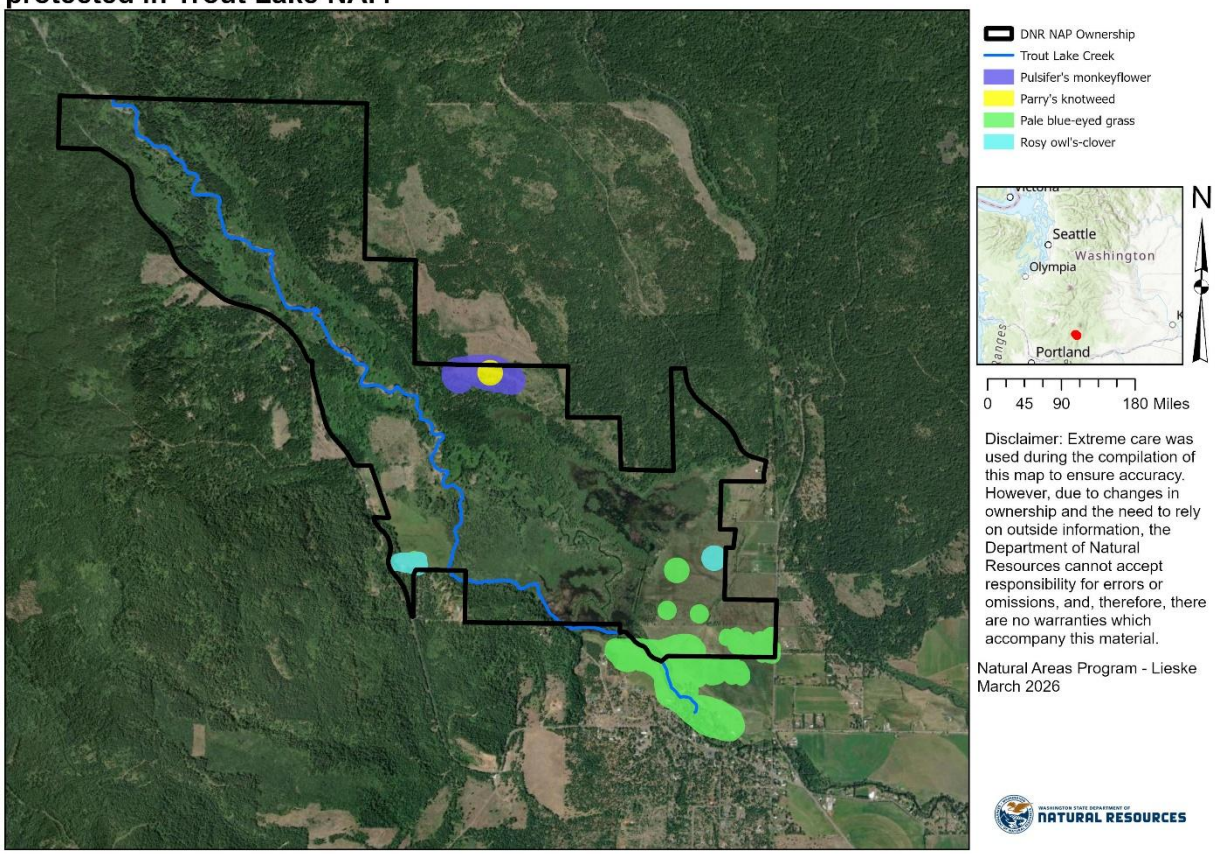
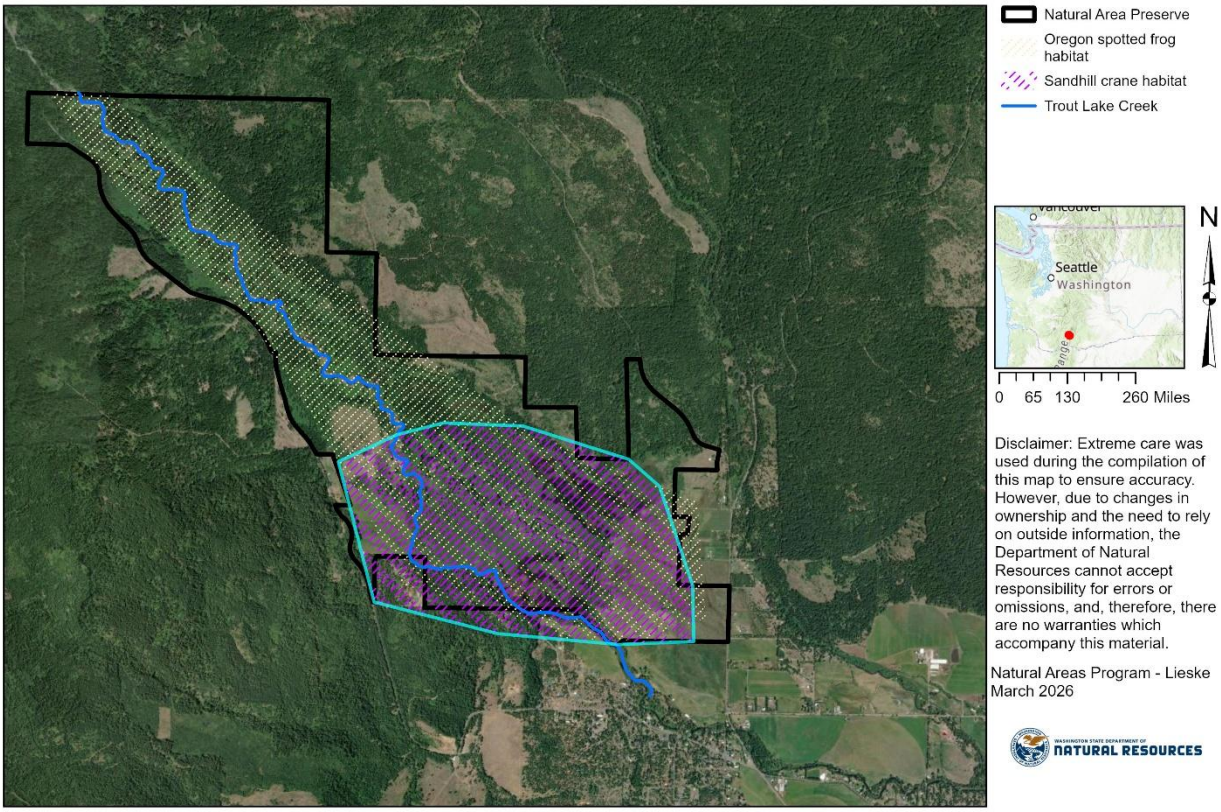


Figure 3 Trout Lake NAP Primary Widlife Species Habitat



Natural Area Designation

Natural area preserves (NAPs) are established to protect exemplary examples of Washington's biodiversity. The collection of natural areas across the state (referred to as the Washington Register of Natural Areas) provides protection for the best remaining examples of each of Washington's native ecosystems and rare species populations, as a way of preserving our natural heritage. Designated natural areas are intended to provide adequate representation of targeted species and ecosystems, provide opportunities for research and education, and contribute to the overall conservation of those species and ecosystems. Sites generally become candidates for natural area preserve status with the discovery of a place that supports exemplary representations of Washington's ecosystems or is extremely valuable for the continued existence of a rare species. Sites are assessed by the Washington Natural Heritage Program for their overall ecological condition and long-term conservation viability, in comparison with other known examples of the same species or ecosystem.

Trout Lake NAP Management Plan Overview

The Trout Lake NAP Management Plan describes management goals intended to maintain or increase the viability of the primary features protected at the site. The plan helps to identify management priorities for natural features and low-impact access to the site. The plan demonstrates how the Natural Areas Program is applying policy and statutory requirements to specific management activities.

Limits of the Trout Lake NAP Plan

The management objectives, actions and provisions outlined in this plan apply only to the DNR-owned lands. DNR will implement the management actions as resources become available. The basis of future budget requests for maintenance, monitoring and operations will reflect the objectives and actions of this plan. To develop the management plan for the NAP, DNR staff conducted wildlife and plant surveys and inventories (Appendix 5), and collected input from area residents, agencies and Tribes.

Agency Overview

The Washington State Department of Natural Resources (DNR) manages 5.7 million acres of forest, range, agricultural, commercial, conservation, and aquatic lands in trust for the people of Washington. State-owned upland trust lands are managed to produce revenue for various trust beneficiaries, including schools, state facilities and, in some cases, local government services.

As of 2025, DNR manages nearly 173,000 acres of conservation land at 97 natural areas throughout the state within the Natural Areas Program. Primary management objectives in DNR-managed natural areas include conservation, research and environmental education, as well as low-impact recreation that does not adversely impact the species and ecosystems for which the NAP protects. DNR manages two types of conservation lands, natural area

preserves (NAPs, under RCW Chapter 79.70) and natural resources conservation areas (NRCAs, under RCW Chapter 79.71). DNR-managed natural areas contribute to meeting the requirements of the HCP for the state-owned trust lands. NAPs and NRCAs provide habitat and/or support one or multiple life stages for various species of concern protected under the HCP.

DNR Natural Areas Program

After a site has been designated and acquired as a natural area, it is managed by the DNR Natural Areas Program, which works to fulfill DNR policies and legislative provisions under RCW 79.70 and RCW 79.71. Management objectives seek to protect the primary natural features of each natural area and provide opportunities for research, environmental education, and other access that are compatible with conservation. Active management is necessary in many natural areas to ensure the long-term viability of the priority species and ecosystems protected within them.

DNR's Southeast Region Natural Area staff are charged with management of the Trout Lake NAP. They coordinate with Natural Areas Program science staff in Olympia to identify appropriate management and restoration activities at the site.

State of Washington Natural Heritage Program

The Washington State Legislature recognized the need for a systematic and objective approach to guide inventory and protection efforts for natural features most at risk, and to efficiently focus scarce conservation resources. As a result, the Washington Natural Heritage Program was established in 1987 to provide a scientific approach to the process of identifying candidate sites for the natural areas system and to gather and share data about the state's imperiled species and ecosystems for environmental assessment, conservation planning, and land management purposes.

The program creates a biennial *State of Washington Natural Heritage Plan* that establishes the framework for a statewide register of natural areas and identifies conservation priority species and ecosystems for broader decision making. This is the primary document used to help drive natural area establishment priorities. It provides guidance to help identify and nominate sites for natural area designation.

Natural Heritage Program staff provide technical support to natural area managers regarding the status, trends, and other information about the rare species and rare or high-quality ecosystems occurring in the NAP.

Natural Heritage Advisory Council

The Natural Heritage Advisory Council (Council), established by the Natural Area Preserves Act (RCW 79.70), advises DNR and other state agencies on the establishment and management of NAPs. The Council reviews and approves or rejects natural area nominations on DNR, Washington State Parks and Recreation Commission, and the Washington Department of Fish and Wildlife lands and then submits a formal

recommendation to the Commissioner of Public Lands or other agency directors. The Council works with DNR or other state agency staff to develop management plans for established natural area preserves and advise DNR on management practices for the preservation and maintenance of high-quality natural areas.

Additionally, the Council may be called upon as subject matter experts to provide guidance for establishment or management of NRCAs, especially as it pertains to protecting the state's rare plant and animal species and high-quality ecosystems, scenic landscapes, and archaeological or geological features.

Applicable Local, State, and Federal Regulations

The following plans and regulatory processes may shape and limit activities or projects that are proposed in the Trout Lake NAP Management Plan.

The Washington Natural Area Preserves Act: (RCW 79.70) In passing the Natural Area Preserves Act, the Legislature recognized the need for, and benefits of, permanently designating areas explicitly for conservation of biodiversity and geological features, research, and education. The Natural Area Preserves Act authorizes DNR to establish and manage a statewide system of natural areas (the Washington Register of Natural Areas) through cooperation with federal, state and local agencies, private organizations and individuals.

These designated natural areas are intended to protect critical habitat for rare and vanishing species, representative examples of the state's ecosystems, and ensure the availability of places for scientific research and education. Today, this system consists of lands managed by numerous federal and state agencies, as well as private conservation organizations. Because they retain much of their natural character, these natural areas serve as reference sites to learn how ecosystems function and to document ecological change in relation to natural ecological processes, thereby providing a baseline from which changes resulting from human-induced stressors or management activities (such as resource production or extraction, or outdoor recreation) can be compared.

The Washington Growth Management Act (GMA): Passed by the Washington State Legislature in 1990, the GMA requires all urban counties and cities to develop and adopt comprehensive plans and regulations to implement these plans. The plan includes countywide planning policies, land use designations (including zoning), urban growth boundaries, etc. The plans are used to guide growth and development for residents living in unincorporated areas of the counties. The two areas of the Comprehensive Plan that are of primary relevance to Trout Lake NAP are zoning and the Critical Areas/Resource Ordinance (see below).

Critical Areas/Resource Ordinances: Klickitat County's Critical Areas Ordinance regulates land use within ecologically sensitive areas. The Washington State Growth Management Act requires the development of regulations, based on best available science,

to protect critical environmental resources and avoid natural hazards. These "Critical Areas" include, but are not limited to, aquifer recharge areas (where water infiltrates to aquifers), geologic hazard areas (such as steep slopes prone to landslides), important wildlife habitats and species, frequently flooded areas (such as floodplains and surfacing groundwater), and wetlands.

Klickitat County Zoning: The Klickitat County Comprehensive Plan was adopted in 1979, and the Trout Lake Sub Area Plan was adopted in 1995. The goal of the Trout Lake Sub Area Plan is to provide a land-use guide that will ensure "all residents and property owners can enjoy the quality of life, scenic beauty and sense of community in the rural setting of Trout Lake. The plan acknowledges that while growth is expected to occur, every effort will be made to preserve the quality of the valley's natural resources and scenic beauty". The property surrounding the Trout Lake NAP includes parcels designated and zoned as "Agricultural/Forest and "Rural Center".

Washington Governor's Executive Order (GEO) 21-02: GEO 21-02 requires agencies to consult with the Washington Department of Archaeology and Historic Preservation and affected Tribes on the potential impacts of a project on cultural resources. The order covers state-funded construction, restoration, or acquisition projects that will not undergo Section 106 review under the National Historic Preservation Act of 1966 (Section 106). It also includes grant and pass-through funding that will culminate in construction or land acquisitions.

National Historic Preservation Act (NHPA) Section 106: Any project at Trout Lake NAP with a federal nexus (such as funding through federal funds) will be required to undergo a Section 106 consultation. In a Section 106 consultation, the federal agency serves as the lead agency for the purposes of the consultation process. Section 106 of the NHPA requires that each federal agency identify and assess the effects that their actions or projects may have on historic buildings, structures, districts, objects, and archaeological sites. The Section 106 consultation process begins when the lead agency consults with the State Historic Preservation Officer and the affected Tribes. During the consultation, key determinations include (1) identification of historic and cultural resources that may be affected by the project, (2) determination of any adverse effects to these resources that may occur as a result of the project, and (3) how to resolve those adverse effects by avoiding negative adverse effects and mitigating for any adverse effects that will or do occur as a result of the project.

Commissioner of Public Lands Order on Tribal Relations #201029: The Commissioner's Order recognizes that Native American culture is characterized by an intimate relationship with natural resources and that DNR shares a commitment with Tribes in protecting natural resources. The order seeks to build intergovernmental relationships based on trust and mutual respect as guided by six principles: Respect for Sovereignty, Interdependence, Sustainable Use, Sound Science, Transparency, and Respect for Traditional Knowledge and Cultural Values.

The Watershed Management Act: The Watershed Management Act of 1998, (ESHB 2514, and RCW 90.82) required local governments to develop watershed plans for managing water resources and protecting existing water rights. The collaborative effort among city, county, and state agencies resulted in the development of management policies and recommendations for water quantity, water quality, aquatic habitat, and instream flow. Water Resource Inventory Areas delineate the management units, following ecological and political boundaries within a watershed. Trout Lake NAP is within the Wind/White Salmon Water Resource Inventory Area (WRIA) 29.

Endangered Species Act: The Oregon spotted frog was listed as threatened under the Endangered Species Act on August 29, 2014 (79 FR 51658). Critical habitat, which encompasses most of the area occupied by the species, was designated on May 11, 2016 (81 FR 29336). The Recovery Priority Number for this species is 8, representing a full species with a moderate degree of threat and a high recovery potential (USFWS 1983).
The Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act) protects species of wildlife and plants that are listed as endangered or threatened. Recovery is defined as "the process by which listed species and their ecosystems are restored and their future is safeguarded to the point that protections under the [Act] are no longer needed," according to the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (Service or USFWS) Interim Recovery Planning Guidelines, Version 1.4 (NMFS and USFWS 2018).

Habitat Conservation Plan: The Washington Department of Natural Resources (DNR) prepared a multi-species Habitat Conservation Plan (HCP) to address state land management issues relating to compliance with the federal Endangered Species Act (16 U.S.C. 1531 et seq.). The plan covers approximately 1.6 million acres of state lands managed by DNR within the range of the northern spotted owl. This Trust Land HCP (Washington DNR 1997) affords incidental take under the Endangered Species Act for permitted management activities while providing fish and wildlife habitat, clean and abundant water, and access to low-impact outdoor recreational opportunities. The HCP makes ecosystem-based recommendations to guide management in a way that protects habitat for at-risk species. The multispecies conservation strategy outlined within the HCP is directed at providing habitat for animal species of conservation concern as well as unlisted animal species and special landscape features identified as uncommon habitats or habitat elements. The conservation strategy identifies three objectives to provide habitat that:

- Maintains the geographic distribution of species that have small annual or breeding season home range areas,
- Contributes to the support of species with large home ranges on federal forest reserves, and
- Facilitates the dispersal of species among federal forest reserves.

Many DNR-managed natural areas within the range of the Northern Spotted Owl (*Strix occidentalis caurina*), including the Trout Lake NAP, are covered by the Trust Lands HCP.

DNR-managed natural areas provide ecosystem services in the form of protection of specific types of habitat and conservation values that benefit the HCP's conservation objectives.

HCP Amendment No. 1 (Administrative Amendment to the Northern Spotted Owl Conservation Strategy for the Klickitat HCP Planning Unit): Since the establishment of DNR's HCP in 1997, monitoring and documentation have shown significant forest health problems on the east slopes of the Washington Cascades, caused primarily by significant disease-caused degradation or elimination of suitable habitat that was compromising the effectiveness of the original HCP spotted owl conservation strategy. The original commitment of the HCP was based on land management strategies on adjoining National Forest lands and tribal lands owned by the Yakama Indian Nation. Declining forest health conditions have affected spotted owl habitat across landownerships, and different landowners have responded to this decline in their own way. To address these changes, DNR sought assistance from USFWS and WDFW to develop a modified, ecologically sound, and operationally feasible strategy that is consistent with the original HCP northern spotted owl conservation goals and objectives. The Trout Lake NAP is located within the Trout Lake Sub-Landscape, identified in HCP Amendment No. 1.

Overall, this administrative amendment results in:

- moving forests toward historic cover types more resistant to fire and insects;
- improving the DNR's ability to meet its HCP commitment by focusing development of habitat where it can be sustained for the long term;
- using sub-landscapes instead of ¼ townships for dispersal habitat, and Watershed Administration Units (WAUs) for nesting, roosting, and foraging habitat;
- providing short-term (10 years) protection of known occupied northern spotted owl nest sites regardless of where they are located;
- eliminating requirements to create and protect habitat where it is not sustainable and where no breeding owls exist; and
- promoting active management of entire landscapes over time to meet both habitat and revenue objectives.

Preserve Description

Preserve Purpose:

Trout Lake NAP was established in 1996 to protect what was, at that time. one of only three known populations of Oregon spotted frog in Washington. The site was also designated to protect Sandhill Cranes (greater) and Pileated Woodpeckers, as well as two rare plant species: pale blue-eyed grass and Pulsifer's monkeyflower. These were all priorities in the 1993-1995 Washington Natural Heritage Plan.

Since establishment of Trout Lake NAP, Natural Areas staff have found additional rare plant species (Table 1; Washington Natural Heritage Plan 2025). These include the state threatened Rosy owl's clover (*Orthocarpus bracteosus*) and the state sensitive Parry's knotweed (*Polygonum parryi*). The federally threatened and state endangered Oregon spotted frogs on the NAP are one of two populations that occur east of the Cascade Crest in Washington and the only Oregon spotted frog population that occurs in the Middle Columbia-Hood River sub-basin.

Because the Trout Lake NAP is within the Trout Lake Sub-Landscape, approximately 600 acres are designated to be managed as nesting, roosting, and foraging (NRF) habitat for Northern Spotted Owls, a federally threatened and state endangered species. NRF habitat may shift on the landscape over time, but the goal is to maintain 50% of the sub-landscape in NRF in order to meet the conservation strategies for NSO habitat.

Natural Area Design:
In 1995, Washington's Natural Heritage Program staff prepared a report that included a recommended boundary and identified the primary natural features justifying the preservation of the proposed NAP. The recommended boundary is the area that Natural Heritage staff concluded were necessary to protect in order to achieve long-term preservation of the primary features. That report was then presented to the Natural Heritage Advisory Council for consideration. The Council approved of the proposed NAP and then recommended to the Commissioner of Public Lands for acquisition of the proposed boundary as a Natural Area Preserve.

A DNR Commissioner's Order, signed by the Commissioner of Public Lands, delineated the boundary of Trout Lake NAP on June 15, 1995. This approved natural area boundary designated lands eligible for acquisition, serving only as an administrative tool to identify where DNR will work with willing-seller property owners. The approved boundary imposes no changes to land use zoning or other restrictions on current landowners. Acquisition of properties within the approved boundary is based on market value as determined by independent, third-party appraisals.

Within the 2,563-acre approved boundary of the NAP, DNR Natural Areas Program currently owns 2,165 acres, while 60 acres are DNR-owned Trust Land. There are approximately 338 acres of privately owned land within the approved boundary that are not included in the current NAP.

Preserve Acquisition:
The Trout Lake NAP boundary contains approximately 2,563 acres of a variety of ecosystems, including upland forest, forested wetland, scrub-shrub wetland, emergent wetland, and riverine/riparian habitat. Within this boundary, 2,165 acres are managed as an NAP and 60 acres are DNR Trust Land. Approximately 338 acres within the approved boundary are currently privately owned and can be added to the NAP in the future through purchase from willing sellers.

DNR's land acquisition at the site began in 1996, following the Commissioner's Order to establish the approved NAP boundary. To date, DNR has made 15 acquisitions totaling 2,165 acres at Trout Lake NAP. Efforts to acquire the remaining properties within the preserve boundary will continue with landowner interest and as grant or other funding becomes available.

The approved Trout Lake NAP boundary, including approved expansions in 2012 and 2024, is shown in Figures 1. Areas acquired and managed by the Washington Department of Natural Resources are also indicated in that map.

Acquisition is from willing sellers only; DNR cannot condemn private property for inclusion in the natural area. Acquisition from potentially willing sellers within a boundary is based on market value as determined by independent, third-party appraisals. Landowners may also be interested in retaining ownership and selling a conservation easement on their property. DNR will work with landowners who may not wish to sell by seeking their participation in joint management of the Trout Lake Natural Area Preserve or by pursuing the listing of their lands on the Washington Register of Natural Areas as a voluntary registry site.

Ecological Characteristics of the Trout Lake NAP:
Geology
On a clear day the snow-capped volcano Mount Adams forms a backdrop to the Trout Lake NAP. Located 10 miles to the north of the Trout Lake NAP, Mount Adams has produced lava flows and mud flows for the last 500,000 years that have significantly reshaped areas around the mountain, including Trout Lake. The most recent, major event to affect the Trout Lake lowland occurred approximately 6,000 years ago, when a lahar (volcanic mud flow) from Mount Adams inundated the Trout Lake Creek valley. The lahar occurred when a large section of the Mount Adams summit plateau collapsed, transforming into a rapidly moving mixture of mud and water. A lack of evidence for an associated eruptive event suggests that the lahar occurred spontaneously (Scott et al., 1995)—such spontaneous lahars occur on Mount Adams due to gradual weakening of the volcanic edifice by hydrothermal alteration of volcanic rock and ash into weak clays, which eventually causes part of the mountain to collapse without warning (Vallance, 1999). The Trout Lake Mudflow traveled 35 miles down the White Salmon River valley, reaching Husum (Scott et al. 1995). The resulting deposit, estimated at 66 million cubic meters (~86 million cubic yards), blocked the river, forming Trout Lake and altering the courses of the White Salmon River and Trout Lake Creek (Vallance 1999). Since then, sedimentation has been gradually filling in Trout Lake, changing the lake into a marshy wetland.

Beneath and adjacent to the lahar deposits are older basalt and andesite. These volcanic rocks were deposited by past lava flows from Mount Adams and other sources. Mount Adams has been erupting lava flows for around 500,000 years (USFS, 1996), and dozens of smaller, associated volcanoes have been active in the area for over 1,000,000 years. These shield volcanoes, lava domes, and lava- flow vents comprise the Mount Adams and Indian Heaven volcanic fields, which surround the Trout Lake NAP. Unlike Mount Adams, which has erupted repeatedly and remains active, the smaller volcanoes usually just erupted once. Examples of these smaller, older volcanoes include Flattop Mountain and Cakey Butte. One small volcano in the area includes the Guler Ice Caves, the space for which formed when a lava flow surface hardened and its liquid interior drained out. This created a shaded void that stays cold enough to maintain ice year-round.

In addition to the geologically recent volcanic deposits from Mount Adams and associated volcanic fields, the southern and western edges of the Trout Lake NAP include much older volcanic rocks. These older volcanic deposits include the Grande Ronde Basalt of the Columbia River Basalts, which is around 15 million years old and flowed westward into the area from southeastern Washington, as well as Oligocene volcaniclastic rocks, deposits from ancient Cascade volcanoes that erupted around 30 million years ago (Korosec 1987).

Ecological Setting

The NAP is located within the floodplain of the lower portion of Trout Lake Creek approximately ten miles south of Mount Adams. The width of the floodplain within the NAP ranges from less than a half mile at the northwest, upstream end of the site to over one mile at the eastern end. The site is relatively flat, dropping from 1,970 feet in elevation at its northwest end to 1,940 feet at the east end, two miles downstream. Small-scale topographic relief within the floodplain creates areas of slightly higher terrain, as well as depressions. On the north and south, the site extends to the bottom of the adjacent slopes that mark the edge of the floodplain. To the west, Trout Lake Creek continues upstream in a relatively narrow drainage, while to the east the wide, flat floodplain extends another one to two miles to the White Salmon River floodplain.

Flows in Trout Lake Creek are influenced by snowmelt and rainfall, as well as diversions for agricultural use. During the November-to-May period, a large portion of the NAP is typically inundated to depths of one to four feet. Only the extreme eastern and western portions of the NAP do not typically flood. The duration of flooding varies considerably, from a few days to several weeks. In general, most of the site is at least saturated from November to mid-May, but this can vary by several weeks. By late August the site is generally quite dry, and it is possible to walk through much of the area, except through the main channel, adjacent low areas, and scattered depressions that retain standing water.

Trout Lake itself has transitioned from a shallow, open body of water into more of an emergent marsh. While this is a natural process, it may be transitioning more quickly as a result of siltation caused by past agricultural and logging practices. It could also be the result

of lower water tables caused by irrigation withdrawals downstream or removal of beavers from downstream localities. The Trout Lake Creek channel has shifted over time, and the impact of that channel change is also unknown and there may be interactive effects. The shallow emergent marsh at the south end of the "lake" now appears to be a relatively undisturbed emergent wetland (Napp 2001).

Wetlands associated with Trout Lake and contributing riparian areas are structurally diverse, and include forested scrub/shrub, and emergent wetlands. The site also provides areas of both seasonal and permanent ponding, providing hydrological diversity and creating niches for a variety of plants and animals. Mixed-aged upland forests are also found in the NAP, including some mature/late mature forests are present. Abandoned pastures and fields also occur within the floodplain.

Vegetation in the NAP consists of a mix of wetland types with small amounts of upland forest on the perimeter. Upland forests on the site and in the immediate surroundings are characterized by mixed species composition, with Douglas-fir (*Pseudotsuga menziesii*) and grand fir the most abundant tree species and are classified as the East Cascades Moist-Mesic Grand Fir – Douglas-fir Forest Group (USNVC 2026). Small areas of Cascadian Oregon White Oak – Conifer Woodland area also found in the NAP.

Forested wetlands in the NAP are dominated by black cottonwood (*Populus trichocarpa*), quaking aspen (*Populus tremuloides*), western red cedar, and/or grand fir. These riparian wetlands are classified as the Central Rocky Mountain Lowland & Foothill Riparian Forest Group.

Scrub-shrub wetlands on the site consist of dense shrub thickets, most of which are dominated by Douglas' spiraea (*Spiraea douglasii)* and/or willows (*Salix hookeriana, Salix geyeriana, Salix lasiandra*, among others). These wetlands are classified as the Western Montane-Subalpine Riparian & Seep Shrubland Group.

Emergent wetland ecosystems in the NAP are classified as the Pacific-Rocky Mountain Montane Wet Meadow & Marsh Group. Sedge (*Carex spp*.) meadows occupy a large portion of the NAP and are inundated during winter and early spring but dry out significantly during the summer. The major sedge species that form these meadows include beaked sedge (*Carex utriculata*), inflated sedge (*Carex exsiccata*), and Sitka sedge (*Carex aquatilis* var. *dives*), although a number of other sedge species are also found within these communities. Patches of bulrush (*Schoenoplectus acutus*, *S. tabernaemontani*) are found in areas that remain inundated for longer periods. A variety of grass and rush (*Juncus* spp.) species are scattered throughout these communities, as well, and reed canarygrass (*Phalaris arundinacea*) is present in varying amounts, forming dense stands in several locations and occurring as scattered individuals in others. In areas with more persistent inundation, emergent communities become dominated by spike-rush (*Eleocharis palustris*) and swamp horsetail (*Equisetum fluviatile*). Aquatic species, primarily pond-weeds (*Potamogeton spp*.) and yellow pond lily (*Nuphar polysepala*), as well as swamp horsetail, occur in habitats

closest to the main Trout Lake Creek channel and other deep depressions where standing water is present year-round.

On the eastern and western edges of the site, where there is a history of agricultural use and relatively brief, shallow inundation during flood events, vegetation consists of a mixture of introduced pasture grasses, sedges (primarily Nebraska sedge *(Carex nebrascensis*)) and scattered shrubs. Reed canarygrass is most prevalent in the wetter portions of these areas.

Structures: There is an historic barn, referred to as the Hollenbeck Barn, located in the south-central portion of the NAP. A gated entrance to this area provides management access by vehicle. This is a designated public access site; however, visitors must enter by foot, around the locked gate. At this site there is a public restroom facility, along with interpretive signage and a wooden platform for viewing the seasonally flooded meadow with a view of Mt. Adams.

Another modern barn structure is located in the northeastern portion of the NAP. This structure is used by management as a storage facility. Adjacent to this structure is a concrete vault public restroom.

In the northwest corner of the NAP, there is a decommissioned campground that was privately owned and operated prior to DNR ownership. As of the writing of this management plan, there is an outhouse facility at this site that is planned for removal. A locked gate prevents public vehicles from entering this portion of the site.

Unacquired Lands Within the Approved Boundary: The approved natural area boundary (Figure 1a) currently includes approximately 338 acres that are held in private ownership and therefore not managed by DNR. Those 338 acres include seasonally wet meadows that provide habitat for the primary features of the site. Other sections of those 338 acres could be utilized as access points for site management activities. Efforts to acquire the remaining properties within the preserve boundary will continue with landowner interest and as grant or other funding becomes available.

Adjacent Lands: Private lands adjacent to the approved boundary are currently used mostly for residential and agricultural purposes, including grazing and hay production.
Larger adjacent landowners include the United State Forest Service, private timber companies, and DNR Trust Lands.

Natural Features Description

Trout Lake NAP Primary Natural Features
At the time of site establishment, five priority species identified in the 1993-1995 Natural Heritage Plan were present at Trout Lake NAP (Appendix 4). Since that time of site establishment, one priority species, Pileated Woodpecker (*Drycopus pileatus*) is no longer considered to be a State Sensitive species. At the time of site establishment, rosy owl's-clover and Parry's knotweed had not been documented on-site but were documented in subsequent years. Table 1 shows the list of primary features at the site, including their current Natural Area Representation Priority and their priorities when the site was proposed in 1995.

Table 1. Primary features found at Trout Lake NAP

	Primary Feature	Federal / State Conservation Status / Global/State Rank (2025)	Natural Heritage Plan Natural Area Representation Priority (2025)	Natural Heritage Plan Priority (1993-1995)
Vascular Plants	*Erythranthe pulsiferae* [Pulsifer's monkeyflower]	State Sensitive G4?/S2	Priority 2	Priority 3
	Orthocarpus bracteosus [rosy owl's-clover]	State Threatened G3?/S2	Priority 2	No known from the site at the time
	Polygonum parryi [Parry's knotweed]	State Sensitive G4/S1	Priority 2	No known from the site at the time
	Sisyrinchium sarmentosum [pale blue-eyed grass]	State Threatened G2/S2	Priority 1	Priority 2
Animals	*Grus canadensis* [Sandhill Crane]	State Endangered G5/S1B	Priority 2	Priority 1
	Drycopus pileatus [Pileated Woodpecker]	G5/S4	Not assigned.	Priority 3
	Rana pretiosa [Oregon spotted frog]	Federally Threatened / State Endangered G2/S1	Priority 1	Priority 2

Appendix 4 (available online at https://dnr.wa.gov/natural-areas/natural-area-preserves/trout-lake-natural-area-preserve) contains the DNR Natural Heritage Program

recommendation report that includes information on site topography, geology, soils, hydrology, and additional conservation features. The 2025 State of Washington Natural Heritage Plan, which describes the conservation methodology for NAPs, is available online at the Natural Heritage Program webpage.

A list of species known to occur on the site is included in Appendix 5 (available online at https://dnr.wa.gov/natural-areas/natural-area-preserves/trout-lake-natural-area-preserve).

Primary Wildlife Species:

Oregon spotted frog

The Oregon spotted frog is a medium-sized frog, three to four inches in length, with reddish-brown, tan, or olive-green coloring on the back and black spots on the back, sides, and legs. It is the most aquatic frog species in the Pacific Northwest, occurring in lakes, ponds, wetlands, riverine oxbows and floodplains, and altered habitats such as farmed floodplains and ditches (USFWS 2024b).

Oregon spotted frogs need year-round access to water. They primarily use emergent wetland habitat but will move into flowing water during periods when wetlands dry, to disperse, and for overwintering if wetland waters freeze to the sediments or oxygen levels drop too low during periods when cap-ice and snow block photosynthesis. Breeding habitat is in the seasonally flooded margins and shallows of the wetland with full sun exposure and short vegetation that does not shade the egg masses. For overwintering, they need to be in water that does not freeze to the sediments and remains oxygenated.

It is estimated that the species has been lost from 70-90% of its historic range (USFWS 2014). It was listed as a State Endangered species in Washington state in 1997 (McAllister & Leonard 1997) and a Fedearlly Threatened in 2014 (79 FR 51658). In 2016, the Trout Lake NAP was designated as critical habitat for the frog in accordance with the Endangered Species Act.

Throughout its range, Oregon spotted frogs are currently found within small portions of 16 sub-basins, including seven in Washington, eight in Oregon, and one in British Columbia (USFWS 2024a). Population size estimates for individual Washington locations, based on numbers of egg masses counted in 2023, ranged from potentially extirpated to approximately 3,126 frogs (USFWS 2024a.).

Sandhill Crane (greater)

Sandhill Cranes are wading birds characterized by long legs, necks, and bills. They are opportunistic omnivores feeding on a variety of foods including roots, bulbs, grains, berries, snails, earthworms, insects, amphibians, lizards, snakes, mice, and greens (Tacha et al. 2014). They were listed as an endangered species by the state of Washington in 1981.

The greater sandhill cranes that occur in Washington State and on the NAP are part of the Central Valley population, which winters in the Central Valley of California. This

population is divided into two segments because of current disjunct distribution. The southern segment breeds in south-central Washington, eastern and central Oregon, northeastern California, and northwestern Nevada, while the northern segment breeds in British Columbia. According to WDFW, Greater Sandhill Cranes currently breed at approximately six locations in Washington, in Klickitat and Yakima Counties. The breeding population in Washington numbers an estimated 40 pairs but reports indicate those numbers have slowly been increasing. Factors potentially affecting Washington's Sandhill Cranes include water availability and management, habitat loss and degradation at staging and wintering areas. Public lands, including the Trout Lake NAP, provide essential habitat (Stinson 2017).

A more detailed description of these species can be found in Appendix 4 (available online upon completion of this plan), and also at the WDFW website: https://wdfw.wa.gov/species-habitats/species/antigone-canadensis-tabida#conservation

Primary Rare Plant Species: Trout Lake NAP supports two State Sensitive and two State Threatened species (DNR 2025) (Table 1).

Pale blue-eyed grass (*Sisyrinchium sarmentosum*) is a State Threatened species and endemic to northern Oregon and southern Washington (Klickitat and Skamania counties) in the vicinity of Mount Adams and Mount Hood. It typically has dark blue-purple tepals and outer bracts that vary slightly longer to twice as long as the inner bracts. Hybrids between *S. sarmentosum* and *S. idahoense* have been documented in Washington and can be recognized by intermediate flower color and bract proportions. This species grows in meadows and forest openings ranging in elevation from 300-5,700 feet. Habitats are typically dominated by grasses and sedges, with very little shrub or tree cover, and have heavy snow accumulations and/or are inundated with water in the winter and spring. There are currently 13 known populations in Washington and approximately 6 populations in Oregon. Populations range in size from fewer than 10 plants to approximately 5,000 plants.

Rosy owl's-clover (*Orthocarpus bracteosus*) is a State Threatened species. This is an annual hemiparasitic herb in seasonally wet meadows, vernal pools, and coastal prairies occurring in western North America from southwestern British Columbia, Canada south in the United States to northeastern California. In Washington, it is found in Klickitat, San Juan, Skamania, Whatcom, and Yakima counties. In Washington, the species is associated with moist meadows in the transition zone between wetland and upland; they are dominated by grasses and forbs and in full sunlight with little to no shrub or tree cover. This species flowers from June to August.

Pulsifer's monkeyflower (*Erythranthe pulsiferae*) is a State Sensitive species. It is a slender, glandular-hairy annual herb that occurs in scattered locations from eastern Washington to western Oregon and northern California. Washington populations are found in seasonally wet or moist open areas. The 6 extant Washington populations of this species occur in Klickitat, Skamania, and Yakima counties.

Parry's knotweed (*Polygonum parryi*) is a State Sensitive species and occurs from southern Washington (Klickitat County) to southern California. This species, a hairless, compact, often cushion-like annual herb, prefers vernal pools, seasonally damp ground at low elevations, and open places with sandy, gravely, or rocky soil. A member of the buckwheat family, this species flowers from June to July.

Key Features of the Trout Lake NAP: The following species are considered "Key Species" of the NAP, meaning that although they are not the primary features for which the NAP was designated, they are still of high conservation value and are therefore taken into careful consideration with site management actions.

Key Bird Species: The NAP provides habitat for at least 50 species of neotropical migratory birds (Anderson 1994). Over 150 species of birds have been recorded for the site. At the time of the Washington Natural Heritage Recommendation in 1995, Pileated woodpecker (*Drycopus* pileatus) was listed as a Primary Natural Feature for the site due to its conservation status (Table 1).

Northern Spotted Owl was listed as an Endangered Species in Washington by WDFW in 1988 and was listed as a Threatened Species under the ESA in 1990. These owls are about 17 inches in length. They have large home ranges (thousands of acres), of mature and old coniferous forests, such as within the NAP, which they use for nesting, roosting and foraging.

A list of the birds that have been seen in the preserve is found in Appendix 5.

Key Amphibians and Reptiles: WDFW has conducted amphibian surveys within the natural area, identifying common sharp-tailed snake (*Contia tenuis*) and western toad (*Anaxyrus boreas*), both designated as Species of Greatest Conservation Need (SGCN) by WDFW (WDFW 2025). A list of the amphibians and reptiles that have been seen in the preserve is in Appendix 5.

Key Fish Species: Western brook lamprey (*Lampetra richardsoni*) an important species to many tribes in the Pacific Northwest, have been documented in Trout Lake Creek, which is the dominant freshwater feature running through the natural area. Resident coastal cutthroat trout and Rainbow trout have been documented in Trout Lake Creek.

Key Mammal Species: Western gray squirrel (*Sciurus griseus*), Fisher (*Pekania pennanti*), both State Endangered species, and Townsend's big-eared bat (*Corynorhinus townsendii*), a SGCN, have been documented on the NAP (WDFW 2025). The NAP has been an annual monitoring site for the North American Bat Monitoring Program since 2018. The area is also an important wintering habitat for black-tailed deer. It is part of an important movement corridor for a large elk herd and is used for wintering, spring foraging and calving. A number of other mammals use the area including black bear, river otter, mink, coyote,

raccoon, bobcat, cougar, beaver, bats and other small mammals. A list of mammals that have been documented in the preserve can be found in Appendix 5.

Mid-elevation wetland and mid-elevation stream/riparian system:
The wetland and riparian systems (Figure 1c) consist of a mix of wetland vegetation types including forested, scrub-shrub, and emergent. The United States National Vegetation Classification (USNVC) groups likely to be found in these habitats include Central Rocky Mountain Lowland & Foothill Riparian Forest (G796) in the forested wetlands, the Western Montane-Subalpine Riparian & Seep Shrubland (G527) in the wetlands dominated by shrubs, and the Pacific-Rocky Mountain Montane Wet Meadow and Marsh (G521) in emergent communities (Table 2). Open water areas likely represent Western Temperate Aquatic Vegetation (G544) (DNR 2025; USNVC 2026). Given the dynamic nature of Trout Lake Creek, the exact locations of the various wetland ecosystems shift over time within the overall wetland footprint on site. For detailed descriptions of these communities, see NatureServe Explorer.

Table 2. General wetland types and communities found in Trout Lake NAP within the Mid-Elevation Wetland and Riparian habitats as described by the National Wetland Inventory Cowardin classification cross walked with the US National Vegetation Classification at the Group Level

Cowardin Class	USNVC Vegetation Group
Palustrine Aquatic Bed (PAB)	Western Temperate Freshwater Aquatic Vegetation (G544)
Palustrine Emergent Marsh (PEM)	Pacific-Rocky Mountain Montane Wet Meadow & Marsh (G521)
Palustrine Scrub-Shrub Wetland (PSS)	Western Montane-Subalpine Riparian & Seep Shrubland (G527)
Palustrine Forested Wetland (PFO)	Central Rocky Mountain Lowland & Foothill Riparian Forest (G796)

Wetlands of the size and complexity of the Trout Lake system are uncommon in the eastern Cascades of Washington and extremely rare within the south-central portion of the state. Most other wetlands in this region are smaller, less complex, and situated at higher elevations. Lower elevation wetlands are also generally smaller, and most have been heavily altered by livestock grazing and other agricultural practices, hydrologic alterations, and invasive species.

The wetland and riparian ecosystem occupy nearly the entire NAP and appear to be in good ecological condition, though an ecological integrity assessment (Rocchio et al. 2025) has not been conducted. The distribution of various wetland types has changed significantly over the past 100 years, from mostly being a shallow, open body of water to currently being predominantly dominated by vegetated wetlands with only a small amount of open water. Photographs from the late 1800s and early 1900s clearly show the presence of a large lake, and local residents describe the area as a lake up to about the 1950's (Napp 2001). Although

natural successional processes could explain this shift, a number of human influences in the surrounding Trout Lake Creek watershed have likely increased the rate of sedimentation and possibly changed surface water dynamics (USFS 1996). Among these influences are timber harvest, road and bridge building, conversion of natural land cover to agricultural uses, livestock grazing, nearby septic systems, water diversions and recreational trail use. Available data are inconclusive regarding the contribution of these activities to increased sedimentation in Trout Lake; however, it is generally assumed that some or all of these factors have contributed to the observed changes in the system (USFS 1996). Changes to precipitation totals and seasonality could also be affecting water levels in the area.

A moderate amount of hydrologic alteration appears to have occurred within the site. Drainage ditches are present in pasture field on the eastern portion of the site. Most of the ditches are one to two feet wide and run east-west across the field, presumably to drain this area for seeding and cultivation in the past. These ditches drain water toward the main wetland and into a larger ditch four to eight feet wide that runs north-south, emptying into the main Trout Lake Creek channel at its south end. This ditch has filled in substantially with sediment and vegetation and may no longer be draining significant water from the wetland. The smaller ditches have also somewhat filled in but still serve to drain some water from the field. Overall, drainage ditches appear to have affected the seasonally flooded wetland on the periphery of the site much more than the main wetland. A dike which runs along the southern bank of the creek channel, on private land, for approximately one quarter mile at the extreme southeastern corner of the NAP prevents or reduces overflows onto adjacent farmlands and residences immediately south of the creek. The road that formerly crossed the creek channel near the north boundary of the NAP also acts as a dike, particularly on the west side of the channel. The bridge that previously crossed the creek was washed out in the early 1990s; however, the road remains and is elevated several feet above the surrounding floodplain.

Beaver have likely played an important role in the hydrology and distribution of wetlands within the NAP. Beaver impoundments and engineering are beneficial to Oregon spotted frog populations by providing open water areas suitable for breeding. Beaver ponds raise water tables, reduce downstream erosion, lessen flood events (unless the dam is breached), hold water year-round, and maintain stream flow during dry periods (Hallock 2013). While beavers are currently present on the site, the level of beaver activity is probably significantly less than it was historically due to beaver trapping and removal of beaver dams. Declining water levels due to below normal precipitation and drought may have impacted the beaver population in some areas within the NAP (Hallock 2026). This has likely resulted in changes in hydrologic conditions and habitat distributions on the site, although the extent of such changes cannot be determined.

Due to the combination of responses to the possible acceleration of sedimentation and other anthropogenic influences mentioned above, there are significant areas of wetland and riparian plant communities throughout the site that appear to have been affected significantly by hydrologic modification or other human influences. Approximately 80 acres

of what historically appears to have been forested and scrub-shrub wetland was cleared on the west side of the creek channel sometime before 1961. In addition, approximately 100 acres were cleared and cultivated for crops and/or pasture grass on the east side of the site. Beaver dams and log jams cause the water to flow through portions of the site in braided channels, spilling water into overflow pools and adjacent marshes. The shallow emergent marsh at the south end of the former "lake" now appears to be a relatively undisturbed example of the emergent wetland plant community (Napp 2001).

Key Ecological Processes

Key ecological processes are dynamic natural abiotic and biotic processes that drive changes in the plant community and potentially alter the ecosystem. Key processes at Trout Lake NAP include fire in the adjacent upland habitat, and flooding in the riparian wetlands, marshes and meadows within the NAP boundary.

Riparian woodland and shrubland development is driven by the magnitude and frequency of flooding, valley and substrate type, and beaver activity. Infrequent, high-powered floods determine large geomorphic patterns that persist on the landscape for hundreds to thousands of years (Hubert 2004). Floods of intermediate frequency and power produce floodplain landforms which persist for tens to hundreds of years as well as reset succession to early seral vegetation types (LANDFIRE 2007; Hubert 2004). Seasonal and episodic flooding erode and/or deposit sediment resulting in complex patterns of soil development which subsequently have a strong influence on the distribution of riparian vegetation (Gregory et. al. 1991; Poff et. al. 1997). For example, marsh development along riparian areas is driven by the magnitude and frequency of flooding, along with its position in the valley, substrate type, and beaver activity. Seasonal and episodic flooding scour depressions in the floodplain, create side channels and floodplain sloughs, and force channel migration which can result in oxbows. Marsh vegetation is established in those landforms if there is semi-permanent to permanent water present. Water is at or above the surface for most of the growing season. In some areas water levels fluctuate with dramatic drawdowns that can expose bare soil by late summer. The frequency and magnitude of water level fluctuations determine the extent of each marsh zone (floating, submerged, emergent, etc.). Water level fluctuations also support the development of different marsh zones which vary according to the degree of inundation (Rocchio & Crawford 2015).

Beaver can be an important hydrogeomorphic driver of montane riparian systems, especially along unconfined reaches. The presence of beaver creates a heterogeneous complex of wet meadows, marshes and riparian shrublands and increases species richness on the landscape (Rocchio & Crawford 2015). Beaver-influenced streams are very different from those not

impacted by beaver activity by having numerous zones of open water and vegetation, large accumulations of detritus and nutrients, more wetland areas, having more anaerobic biogeochemical cycles, and in general are more resistant to disturbance (Naiman et. al. 1986). As noted previously, beaver activity has been an important driver of ecological conditions within the NAP.

Stand-replacement, fire-return intervals for the upland forested areas of the NAP are typically 150-500 years, with moderate-severity fire intervals of 50-100 years (Fire Regime Group III or IV, LANDFIRE 2007). Under present conditions the fire regime is mixed severity and more variable, with stand-replacing fires more common, and the forests are more homogeneous. With vigorous fire suppression, fire-return intervals are longer, and multi-layered stands provide fuel "ladders," making these forests more susceptible to high-intensity, stand-replacing fires (Rocchio & Crawford 2015).

Climate

The climate of the area is intermediate between conditions typical of the western Cascades and the eastern Cascades. Summers are generally warm and dry, with cool, wet winters. Precipitation is generally higher than other portions of the eastern Cascades at similar elevations, but lower than similar areas in the western Cascades. Climatic data summaries for the NAP are from the weather station at the Mt. Adams Ranger Station in Trout Lake, located less than one mile south of the site (NOAA 2020 & WRCC 2005).

Average annual temperature	47.3° F
Average Winter temperature	31.8° F
Average Summer temperature	63.7° F
Average annual precipitation	45.9 inches
Average annual snowfall	94.4 inches

Climate Change

Climate change has the potential to alter important variables in the Trout Lake NAP environment, key among them being temperature and water regime, which drive plant and animal community composition and species distribution (Chang et. al. 2023). Over the last 100 years, the average annual temperature in the Pacific Northwest has increased by 1.3 degrees Fahrenheit, and temperatures are expected to increase by between 3 and 10 degrees by 2100, with the largest increases anticipated in summer temperatures (Snover et. al. 2013).

Climate change will continue to cause ecological impacts, such as changes in the timing of hydrologic cycles (Mote et. al. 2014). Warmer winter temperatures and shifts in the rainfall patterns in terms of timing and intensity have significant impacts on the environment. Similarly, warmer spring temperatures and hotter average summer temperatures are resulting in lower in-stream flows earlier in the year and longer dry seasons. Forest ecosystems are trending towards becoming warmer and drier in response to rising temperatures, changes in precipitation patterns, and decreased soil moisture (Chang et. al. 2023). These stresses result

in ecosystems more vulnerable to insects and disease, and fire suppression efforts have led to a buildup of fuels that adds to an increased risk of damaging fire. The range of existing ecosystems and communities is likely to change in the future, and novel systems and communities are likely to develop over time.

Based on a study focused on the Columbia Basin region, climate change may have very disruptive effects in watersheds, including Trout Lake Creek. If temperatures increase as projected during the 21st century, areas such as Trout Lake NAP will likely see a sustained and large shift in precipitation from snowfall to rainfall, an earlier seasonal snowmelt, and some changes to the seasonal distribution of precipitation. These effects will almost certainly lead to greater fall and winter water inputs (rainfall and snowmelt) into subbasin, decreasing summer water inputs into subbasins, and shifts in the timing of spring water inputs to earlier in the year, and in many areas, the growth of a preliminary fall peak. The consequent effects will probably be that winter flooding will increase, and spring and summer flows will decrease (Graves 2008).

Managing natural areas like Trout Lake NAP to protect biodiversity and support rare species and habitats in a time of changing climate will help provide refuge, connectivity and corridors to numerous species. Natural areas can provide shelter and a place for species to relocate or adapt to climatic changes. Additionally, these minimally disturbed sites serve as baselines where natural processes dominate and from which we can observe and compare how a natural ecosystem responds to the impacts of climate change and other human influences on the landscape (Noss et al., 2024).

The ecological changes driven by climate change are having profoundly negative impacts on Tribal cultures and traditional and spiritual practices by changing the timing and rhythms of seasonal harvest, reducing or eliminating traditional foods and medicines, and weakening connections between people and the ecosystem through reduction or absence of plant and animal populations and reduced environmental quality. Conserving natural areas will protect natural resources and ecosystems that are at the core of Tribal cultures. Protected from direct disturbance, these ecosystems may persist longer in natural areas, even in the face of climate change, than in the surrounding landscape. DNR acknowledges not just the intrinsic ecological value of the sites, but also the deeper values held for these ecosystems by Tribal partners.

Historical and Current Uses of the Preserve

Historical and Current Native American Tribal Use

Trout Lake NAP is within the traditional territory of the Sahaptin-speaking Klickitat Indians. The area was traditionally occupied by the Klickitat, Yakama, Taitnapam and other closely related Native American groups that are now associated with the Confederated Tribes and Bands of the Yakama Nation. The contemporary sociopolitical boundaries imposed by the

state and federal governments are significantly more stringent than traditional divisions between groups and were formally established by treaties in the late 19th century (12 Stat. 951 (1855)).

Klickitat territory was a place of large communal gatherings in upland prairies (Miller 1998). The ethnographer Verne Ray recorded the locations of 17 villages, camps, and gathering places in Klickitat territory. The largest Klickitat village, *ca'xcaxunmi'* or "crane," was located at Trout Lake (Ray 1936). Hunn (1995) identifies the place as *shaxshax-mi* (kingfisher (or osprey) place) which referred to the entire area around Trout Lake, known for trout fishing and berry picking.

The area is in close proximity to the Columbia River with a network of trails linking to the coast and interior resource locations in all directions (Norton et al. 1999). Tribal people have strong ties to the land and water that inform the management and harvest techniques of the natural resources under their stewardship. The many plant and animal species in their traditional territory provided everything needed to thrive, from clothing and shelter to common and ceremonial tools. The affiliated Indigenous descendants maintain an interest in, and practice stewardship of, the land within their traditional territories, which includes Trout Lake NAP.

DNR recognizes sovereign Tribal rights and authorities and maintains government-to-government relations with all twenty-nine federally recognized Indian Tribes residing in the state of Washington, as well as other Tribes with rights in the state. DNR also recognizes the vital knowledge Tribal peoples have of our shared natural resources and operates under an order from the Commissioner of Public Lands to ensure management of state-owned lands is accomplished in collaboration with the twenty-nine federally recognized Tribes of Washington State.

The Department of Archaeology and Historic Preservation has records of at least ten documented cultural resource locations within one mile of the Trout Lake NAP, though none are currently known within the NAP boundary. The Trout Lake NAP has a very high probability of containing significant cultural resources.

European-American Settlement

The first Euro-Americans to visit the Trout Lake valley were following Native American trails. The first record is from John Work, a Hudson's Bay Company clerk who traveled from The Dalles to Fort Vancouver in May of 1830. He hired Native American guides to take him on an inland route, and this route passed through the Trout Lake valley (Mack 2026). George McClellan, who later became known for his service as Commanding General of the Union Army in the Civil War, traveled parts of this same trail in August of 1853, while seeking a route for a transcontinental railroad. McClellan kept a journal along the route, as did George Gibbs, a geologist and ethnologist, and Dr. James G. Cooper, a

physician and naturalist. The McClellan party left Vancouver following the Klickitat Trail which connected seasonal subsistence locations and served as a trade and communication route (Norton et. al. 1999). Camp "Hoolhool-se" (along present-day Cave Creek) at Trout Lake was reached on August 11, 1853. McClellan (1853) gave a brief description of the area:

> "The soil in this vicinity is poor. The grass good, but very thinly scattered over the surface – The structure of the soil is very shallow. The whole underlaid by a bed of lava. The general appearance of the country is extremely pretty."

Cooper's (1853) diary provides a brief description:

> "After passing the first two miles the wood became very open & of large pine trees standing 20 or 30 yards apart, the ground below being covered with grass and small shrubs. The scene resembled ornamental forest grounds more than wild uncultivated woods. About three miles before reaching camp we met with a series of caverns extending for a mile or more towards Mt. Adams & formed by the expansion of a lava current by steam in-flowing over a riverbed! A former layer of basaltic lava formed the riverbed and now partly forms the floor of this cavern. Siliceous stalactites hang from the roof."

Gibbs (1855) itinerary of McClellan's route from Fort Vancouver to Fort Dalles provides this description:

> "…through a beautiful open wood of excellent yellow pine, coarse, long grass, and light soil, underlaid by lava, to camp on a fine creek; grass good."

At the time of Euro-American settlement, Native Americans were still utilizing the resources of the Trout Lake valley, harvesting tule reeds which grew in the lake to make mats, fishing for trout, gathering bark of the western red cedar, and harvesting a wide variety of plants that were used for both food and medicine. The Stoller family were the first Euro-American settlers in the Trout Lake valley in 1880, moving to Trout Lake from the nearby Glenwood valley. Peter Stoller and his family filed a homestead claim for160 acres, located south and east of the lake. They built a log home and a barn the first year. Up to this time, access to the Trout Lake valley was along the same trail followed by George McClellan in 1853. In 1883 a road was built into the lower end of the valley by R. D. Cameron, a lumberman, allowing people to travel north to Trout Lake from the town of White Salmon and the Columbia River. When completed, this road facilitated the arrival of many families. The new family names, including Stadelman, Pearson, Peterson, Eckhart, Aerni, Byrkett, Coate, Guler, and Schmid, are familiar names today, as well as names for natural and cultural features across the valley (Mack 2026).

William Stadelman is said to have been the first in Trout Lake to experiment with irrigation in 1887. In the spring of 1889 R. A. Byrkett, and William and Frank Coate built the first large-scale irrigation ditch, taking water from the White Salmon River and using it to irrigate the grain sowed that spring. They were pleased with the results, and over the next two decades the majority of the Trout Lake valley came under irrigation. As more settlers arrived, a co-operative dairy association was formed, allowing farmers to better market their butter and cheese. Native Americans continued to camp in the valley each summer, accessing the nearby huckleberry fields (Mack 2026).

In the early 1900's Trout Lake/Guler boasted two stores, a hotel, a tourist club, a stage stop, a Masonic Lodge, a cooperative cheese factory and two post offices. By the 1950s, Trout Lake was a thriving agricultural and lumbering community, with sixty homes and a total population of 233 people. Hollenbeck Lumber Company employed over 60 people, and Mt. Adams Lumber Company employed 15. Over 35,000 pounds of milk was produced daily in the valley and was trucked to Portland for processing and distribution. Trout Lake had a school, a Grange Hall, an American Legion Hall, a volunteer fire department and a post office, along with surfaced roads and homes with electric power (Mack 2026).

Recent History and Use

Public outreach conducted in Trout Lake prior to the designation of the Natural Area Preserve indicated that local residents valued the area for recreational fishing and for general recreational use. Planners incorporated community input into the design of an interpretive trail for public use, with the help of AmeriCorps interns from the Northwest Service Academy (Mack 2026).

The natural area was designated in 1996 and has been expanded over time through lands purchased at market value, from willing sellers, through grants awarded to the Natural Areas Program from the Washington Wildlife and Recreation Program (WWRP).

Private and industrial timber harvesting practices have occurred on parcels that are now within the NAP boundary. DNR Trust Land timber management also occurred on parcels that are now within the NAP boundary. Several of the seasonal wet meadows on the current NAP were part of early homesteads and were managed for agricultural pasture and hay production prior to DNR acquisition.

As the lake itself has changed, community use of the NAP has evolved over time. The Interpretive Trail is a popular place for walkers. The Timberhaven Trail is also a popular walking trail within the NAP.

Current Uses

Access to Trout Lake NAP is limited to scientific research, educational activities, and volunteer opportunities to support site management and restoration. For the protection of the

rare natural features, recreational opportunities are limited to the periphery of the NAP at three designated public access sites (Figure 1d). Bicycles are not allowed. Pets must be leashed and are limited to the Interpretive Trail and the Timberhaven Trail. Service animals must be leashed. See the State Trust Lands Map, or the DNR GO! Map, found on the DNR Website, for a list of alternative access sites for recreational opportunities in the region.

The natural areas manager will work with Tribes to facilitate access for traditional cultural practices at Trout Lake NAP in a way that is consistent with the conservation goals of the site.

Science, Research, and Monitoring

Public and private universities, other research institutions and individual researchers are invited to contact DNR to propose a research project or site visit at Trout Lake NAP. If you are interested in pursuing research at Trout Lake NAP, please contact the Natural Areas Program statewide ecologist (Appendix 11). Educational visit requests will be evaluated for approval by the DNR region office on a case-by-case basis. DNR reserves the right to limit use to protect the conservation values of the NAP. Educational site visit requests can be approved by phone, letter, or in person. DNR may, at its sole discretion, require that DNR staff accompany groups or individuals during site visit(s).

Research proposals should follow Natural Areas Program research guidelines, which are available from the DNR Southeast Region office or Natural Areas Program statewide ecologist. Official letters of project approval or denial including any specific conditions will be issued within approximately two weeks of receipt of a proposal. Multi-year projects will be re-evaluated and notified of approval (or denial) to continue on a yearly basis.

Trout Lake NAP continues to serve as an active research site, supporting the monitoring of Oregon spotted frog populations, Sandhill cranes, bats, and rare plants on the site. See Appendix 7 for more information about the research and monitoring that has occurred on the site.

Environmental Education

Various local and regional organizations and institutions have participated in environmental education programs on the Trout Lake NAP, including the Mt. Adams Institute affiliated Cascades Outdoor School and the Trout Lake School. Service projects through Reed College and AmeriCorps have been conducted at the NAP. The Southeast Region natural areas manager may consult with DNR's Youth Education and Outreach Program (YEOP) to identify suitable opportunities to provide environmental education in partnership with local education entities (schools, skills centers, non-profit partners, extra-curricular programs, etc.). Additionally, YEOP staff may work with the natural areas manager to coordinate access to Trout Lake NAP for environmental education programming through activities such as field trips, site stewardship, data collection, and monitoring projects in collaboration with local education partners. YEOP staff specialize in working with formal and non-formal

educators to develop curricula appropriate to the students and the site, and to provide consultation and training for DNR staff outside the YEOP Program to lead these kinds of events themselves. For more information about educational visits to Trout Lake NAP, contact the DNR Southeast Region natural areas manager (Appendix 11). For more information about environmental education opportunities on DNR Lands, contact the DNR YEOP Program Manager (Appendix 11).

Volunteer and Stewardship Opportunities

Volunteers help with a variety of activities on natural areas, including invasive species control, ecological restoration, and rare species monitoring. Volunteer and stewardship opportunities like these are often well suited for youth groups, which can be engaged through a partnership with DNR's Youth Education and Outreach Program. If you are interested in volunteer and stewardship opportunities in the Trout Lake NAP please contact the DNR Southeast Region natural areas manager (Appendix 11). For more information about volunteer or stewardship opportunities on DNR lands, contact the DNR YEOP Program Manager (Appendix 11).

General Management Guidance

The Washington Natural Heritage Program identifies natural area preserves (NAPs), as defined in RCW 79.70, through a scientific inventory process. The purposes of NAPs are:

- To protect outstanding examples of rare or vanishing terrestrial or aquatic ecosystems, rare plant and animal species, and unique geologic features.
- To serve as baselines against which the influences of human activities in similar, but differently managed ecosystems can be compared; and
- To provide areas that are important to preserve natural features of scientific or educational value.

Limited Intervention in Natural Processes: The preserve ecosystems are susceptible to a variety of insects and other pathogenic organisms. Native insects and other pathogenic organisms are part of the preserve's natural ecological conditions and processes. As such, no management intervention will occur when infestations and diseases are the result of native organisms and natural processes, unless they pose a threat to human life or adjacent landowner property, and require treatment by law. Impacts stemming from non-native insects, pathogens, or anthropogenic events (such as accidents that result in chemical or material spills) that threaten key natural features of the preserve will be managed to the extent possible.

Some properties eligible for inclusion in the NAP may be disturbed or degraded at the time of acquisition. In an effort to enhance and restore these parcels, the DNR Natural Areas Program may conduct restoration projects, potentially collaborating with other conservation partners. The primary objective of any restoration project is to restore key natural features and related natural processes to the desired conditions; or for areas outside of key natural features, to restore to a state that minimizes indirect impacts on key natural features and provides benefits to the broader ecosystem. Where effective, passive restoration is preferred; however, active restoration may occur when:

- It is necessary to address impacts or threats such as altered hydrology, fire suppression and associated changes in ecosystem condition, or physical features like bulkheads, buildings, or roads,
- Natural revegetation is impeded or slowed to such an extent that ecological features or processes in the area will be negatively impacted, or
- The natural colonization of native plants is not fast enough to prevent invasive species establishment.

All restoration project proposals should follow the guidelines in Appendix 12 and will be reviewed and approved by the Natural Areas Program statewide ecologist and the natural areas manager. See Appendix 11 for contact information.

Public Access Policy: Access and allowable uses in natural areas are defined by the Natural Area Public Access Policy (Policy # 13-002, DNR). This policy is consistent with Washington Administrative Code (WAC) 332-52 for Public Access and Recreation on DNR-managed lands and with Revised Code of Washington (RCW) 79.70 for the establishment of NAPs.

Uses within NAPs are limited to low-impact non-consumptive activities, focused on scientific study or environmental educational purposes, or traditional established aboriginal rights. As part of the ongoing site management, the natural areas manager will work with the Natural Areas Program statewide ecologist when considering opportunities to provide low-impact access as funding and staffing allow. Activities and use at the NAP should not compromise a site's integrity or ecological, geological, scenic, historic, or archaeological values. Non-consumptive use means that activities should be constrained in a manner to leave vegetation, animal behavior, soil, and water in place and relatively unaffected. Trout Lake NAP will be monitored, and the allowable uses at the site revised if the protected values of the site are negatively impacted by use in a way that affects the site's integrity as measured by direct observation or an Ecological Integrity Assessment (See Management Goal 1 and Appendix 9).

The natural areas manager will work with Tribes to facilitate access for traditional cultural practices at Trout Lake NAP while ensuring consistency with the site's conservation goals.

Access for research or education projects must be consistent with the site management goals and requires written authorization signed by either the natural areas manager or the natural areas program ecologist. Individuals granted permission to access the site beyond designated trails must carry two copies of written authorization signed by the natural areas statewide program ecologist. One copy should remain in their parked vehicle, and the other copy must be carried while conducting authorized activities on site. Contact the DNR Southeast Region natural areas manager to request consideration of a research or education project at Trout Lake NAP.

The DNR *Natural Areas Preserve Public Access Policy* is found in Appendix 6 or available via the Internet at the Trout Lake NAP webpage. For a map of low-impact recreation opportunities on DNR-managed lands in the area, use DNR's statewide interactive recreation map or the DNR GO! Map online.

Goal 1: Protect Primary Features

As a NAP, the purpose of land management at Trout Lake NAP is to protect the primary features of conservation significance from human-induced stressors (Table 1, Figure 2). Any activity or management action taken at the site should first consider whether it would risk the viability or ecological integrity of these primary features. Additionally, potential

cumulative impacts that could negatively affect the condition of these primary features should be evaluated.

Objective: Address Research Needs in Support of Primary Features
Research provides key insights into the ecological drivers of site conditions and relationships between species and their environment. There are often specific needs for data collection and research to inform adaptive management of the site. These needs are site-specific and may evolve over time as we identify shifts and impacts driven by climate change or other cumulative stressors. Research should be conducted in collaboration with the natural areas manager and staff, under permit approved by the natural areas program ecologist to successfully support and protect the primary features at Trout Lake NAP. DNR's Natural Heritage Program scientists should also be engaged when research is focused on the primary features identified in the Washington State Natural Heritage Plan.

See Appendix 8 for the current and future research needs for Trout Lake NAP.

Objective: Follow Management Guidance for Primary Features
The guiding principle for managing the Trout Lake NAP is to permit natural ecological and physical processes to predominate, while limiting activities and preventing actions that directly or indirectly modify them. Exceptions may occur when a primary feature would be jeopardized without active intervention, such as during restoration projects.

Management activities will maintain the site in the best ecological condition possible. Removal or alteration of vegetation, soil, or rock is not allowed except where specifically authorized by DNR under the framework of this plan. Goals for preserve management include:

- Protecting the site's primary natural features, including ecosystem processes,
- Monitoring threats to the natural features and the health of natural systems,
- Managing non-native and invasive plant or animal species,
- Conducting habitat restoration when naturally occurring native plants will not colonize the area fast enough to prevent invasive species establishment,
- Protecting cultural and archaeological sites,
- Facilitating environmental education and research on the preserve,
- Inviting interested Tribal partners to participate in the development of restoration plans to incorporate Traditional Ecological Knowledge (TEK) and consider traditional land management practices,
- Providing access when it is compatible with the preserve's conservation goals, including Tribal access for cultural and spiritual practices.

The overarching management goal is to maintain the ecological integrity of natural areas such that they do not deteriorate below the ecological condition at the time of establishment. Monitoring specific components and processes of ecosystem features are detailed in the Oregon Spotted Frog Recovery Plan (USFWS 2024) and Sandhill Crane Recovery Plan

(WDFW 2002). Key background and goals for the management of primary features are established in this plan, with additional detail provided in Appendix 9.

In the event that habitat restoration is required, Natural Areas Program staff will conduct restoration projects, possibly collaborating with conservation partners. The primary objective of any restoration project is to restore primary features and related natural processes to the desired conditions; or for areas without primary features, to restore to a state that minimizes indirect impacts on primary features and provides benefits to the broader ecosystem. Where effective, passive restoration is preferred; however, when active restoration is necessary, then a restoration plan should be developed using the guidelines in Appendix 12. All restoration projects, including construction designs and revegetation plans, will be reviewed and approved by the Natural Areas Program Statewide Ecologist and the Natural Areas Manager. See Appendix 11 for contact information.

Various information sources describing reference conditions (i.e. the natural range of variability of composition, structure, and ecological processes) for the ecosystems have been consulted and should continue to be used to help guide management (see details in Appendix 9).

Primary Rare Wildlife Species

Oregon spotted frog

The Trout Lake wetland system contains one of the twenty-two known Washington occurrences of the Oregon spotted frog. Since monitoring began at the Trout Lake NAP site in 1997, the population peaked at approximately 2,492 breeding adults based on the 2013 survey results. The Trout Lake population, estimated at 504 breeding individuals based on the most recent egg mass count, conducted in 2025, has experienced a significant decline since the peak in 2013 (Hallock 2025). Oregon spotted frog habitat suitability and connectivity within the Trout Lake NAP are strongly influenced by hydrological conditions and the extent and duration of wetland inundation. Long term monitoring indicates the breeding population declined during extended periods of below normal precipitation and drought, including 2001-2005 and 2014-2019 (Hallock 2012). Historically, high water during the breeding season allowed frogs to disperse throughout the larger wetland complex. However, recent years of drought have resulted in an overall reduction in suitable wetland habitat into the late summer, causing isolation within the populations (USFWS 2024a). On the NAP, Oregon spotted frogs primarily are found in open, shallow emergent wetlands where breeding and ovipositing occurs. These are typically dominated by sedges, rushes, and/or reed canary grass. During fall and winter, frogs apparently move into deeper waters, including ponds and the slow-moving margins of the Trout Lake Creek channel (Hallock and Pearson 2001). Frogs have also been observed in shallow pools in black cottonwood stands and in ditches or depressions with standing water in otherwise dry pasture areas (McAllister and Leonard 1997). During breeding season, Oregon spotted frogs and their egg masses have been found in twelve separate locations, including the USFS Beaver Pond that

is outside the NAP (Leonard 1997, Hallock 2012). In a 2001 study of fall and winter habitat use, frogs were found in deeper water habitats in the south-central portion of the site and along the margins of Trout Lake Creek in the southwest corner of the site (Hallock and Pearson 2001). During surveys in late summer 2025 when the major emergent wetland areas were primarily dry, Oregon spotted frogs were found on still-water edges and backwaters of Trout Lake Creek, in the still-water shallows along braid bars in the creek, and in small pools and ponds that persisted (Hallock 2026).

The entire population is on the NAP, except for a small pond on U.S. Forest Service land. This population was once one of the largest in Washington. It is currently reduced in size due to multiple years of below normal precipitation and drought. The potential for recovery is high given more normal hydrology because of the relatively undisturbed habitat, lack of invasive bullfrogs, vegetation and hydrological management for the species. The NAP provides important connectivity between Oregon spotted frog breeding areas on the Gifford Pinchot National Forest and the areas further downstream within Trout Lake NAP.

Sandhill Crane (greater)

Since its designation in 1996, Trout Lake NAP has been a critical habitat for migrating and breeding Sandhill Cranes. They have been observed flying through the site, staging, and nesting in the more open marsh habitats and meadows. Sandhill Cranes defend exclusive nesting territories and return annually to the same site (Drewien et al. 1999, Tacha et al. 2014). The species was first observed nesting within the NAP in May 2013 (D. Anderson, pers. comm.).

The Greater Sandhill Cranes of south-central Washington typically arrive at their nesting sites between late February and mid-March. They select nesting areas that are surrounded by water and use wetlands for foraging, with vegetation consisting of a mixture of canarygrass and native species. Cranes pile nesting material into a mound, usually in shallow water, and a typical clutch of 2 eggs is incubated for approximately 30 days (Tacha et al. 2014). Once young fledge, families join with unsuccessful pairs, yearlings, and subadults at communal roosting sites until migrating south. Cranes usually roost by standing in open water where little emergent vegetation is present (Littlefield & Ivey 2002).

Additional information about the ecology, distribution, and threats associated with these rare species can be found in the following links:

- Oregon spotted frog: https://wdfw.wa.gov/species-habitats/species/rana-pretiosa
- Sandhill crane: https://wdfw.wa.gov/species-habitats/species/antigone-canadensis

Management Goals:

- Adhere to goals and objectives identified in USFWS Recovery Plan for Oregon spotted frog (USFWS 2024) and the Washington State Recovery Plan for the Oregon Spotted Frog (Hallock, in prep. [expected completion is 2026]).

- Adhere to goals and objectives identified in WDFW Recovery Plan for the Sandhill crane (WDFW 2002).

Primary Rare Plant Species

Pale blue-eyed grass: The Trout Lake population of pale blue-eyed grass is one of 14 known occurrences of this species in Washington state. This tufted perennial herb is found within the south-central and extreme southeastern portion of the NAP boundary, where it grows in open meadow habitat dominated primarily by various grass species, mostly introduced pasture grasses. During a 2021 survey, 322 plants were observed flowering on the NAP.

Rosy owl's-clover: The Trout Lake NAP population of rosy owl's clover is one of 10 known occurrences in Washington state. This species was first documented on-site in 2010; therefore, it was not included in the primary features of the site's recommendation report by the Washington State Natural Heritage Program. In 2010, there were an estimated 5-10 plants. These were observed in the south-central portion of the NAP. The most recent survey for that same location in 2016 did not locate any plants, perhaps due to the survey being conducted too late in the season. At another location along the western boundary of the NAP, a survey conducted in 2012 found "tens of thousands of plants". The most recent survey at that same location conducted in 2016 found 1,500-2000 plants. Populations of the annual species show large swings in abundance from year to year, perhaps reflecting differences in annual precipitation (Fertig and Kleinknecht 2020).

Pulsifer's monkeyflower: The Trout Lake NAP population of Pulsifer's monkeyflower is one of 6 known occurrences in Washington state. This species is found in the north central portion of the NAP, where it grows in an approximately ten-acre oak woodland on a steep, south-facing slope within a surrounding Douglas-fir forest. The population is located on a loose, rocky volcanic silt loam substrate that appears to have subsurface moisture through the growing season. This is an annual plant species, so numbers of plants in the population may fluctuate considerably from year to year. In 1993, there were an estimated 300-800 plants in this population; in 2000 the estimate was in the thousands; in 2018 the estimation was 100-500 plants.

Parry's knotweed: Trout Lake NAP contains the only known population of Parry's knotweed in Washington. The population at the NAP was estimated at 100-300 plants in 2000 (Fertig and Kleinknecht 2020) but has not been relocated since (most recent survey conducted in 2022). This species was not documented on-site at the time of the NAP establishment; therefore, it was not included in the primary features of the site's recommendation report by the Washington State Natural Heritage Program.

Additional information about the ecology, distribution, and threats associated with the rare plants can be found in the following links:

- Pale blue-eyed grass: https://fieldguide.mt.gov/wa/?species=sisyrinchium%20sarmentosum
- Rosy owl's-clover: https://fieldguide.mt.gov/wa/?species=orthocarpus%20bracteosus
- Pulsifer's monkeyflower: https://fieldguide.mt.gov/wa/?species=erythranthe%20pulsiferae
- Parry's knotweed: https://fieldguide.mt.gov/wa/?species=polygonum%20parryi

Management Goal:
Maintain stable or increasing populations and distribution within the site, accounting for natural range of variation, with a focus on reducing invasive species competition.

Goal 2: Provide and Manage Access

Access requires a permit and is only for research, education, and restoration. Low-impact recreation is allowed only on the periphery of the NAP at three designated locations (Figure 1d) and the only allowed activities are those that leave vegetation, animal behavior, soil, and water courses relatively unaffected (i.e., do not threaten the integrity of the natural area or the natural features). Research, education, and restoration activities may require a permit prior to accessing the site. Individually authorized activities in the NAP will be managed to maintain the site's ecological integrity and geological, scenic, historic and archaeological values. The Natural Areas Program, under the DNR *NAP Public Access Policy* in Appendix 6 (click here for a link to the appendix), maximizes the educational value of NAPs through conservation management to preserve natural features for scientific research and environmental education.

Development of any projects to facilitate additional low-impact use at the site will undergo a separate community outreach and planning effort. Trout Lake NAP will be monitored in accordance with WAC 332-52-100, and the allowable uses mentioned in this plan will be revised if the protected values of the site are negatively impacted by use in a way that affects the site's integrity as measured by direct observation of site condition or by an Ecological Integrity Assessment (See Management Goal 1, and Appendix 9).

Objective: Offer Access for Education and Teaching
DNR staff will continue to offer guided educational access throughout safe areas of the site as staff availability permits. The DNR region natural areas manager may coordinate with DNR's Youth Education and Outreach Program (YEOP) to facilitate access and engagement opportunities for local youth. Key opportunities for classroom and community educational projects and activities include:

- Guided school outings,
- Native plant and bird groups,
- Volunteer activities, and
- Access to environmental interpretive features.

For more information about educational visits to Trout Lake NAP, contact the DNR Southeast Region natural areas manager (Appendix 11). For more information about environmental education opportunities on DNR Lands, contact the DNR YEOP Program Manager (Appendix 11).

Objective: Offer Access for Research and Monitoring
Research projects may be approved by the Natural Areas Program statewide ecologist, in collaboration with the DNR region natural areas manager, following review with appropriate site protection stipulations. Research proposals should follow Natural Areas Program Research Guidelines, which are available from the region natural areas manager. Official letters of project approval or denial including any specific conditions will be issued by Natural Areas Program staff within approximately two weeks of receipt of a proposal. Multi-year projects will be re-evaluated and notified of approval or denial to continue on a yearly basis.

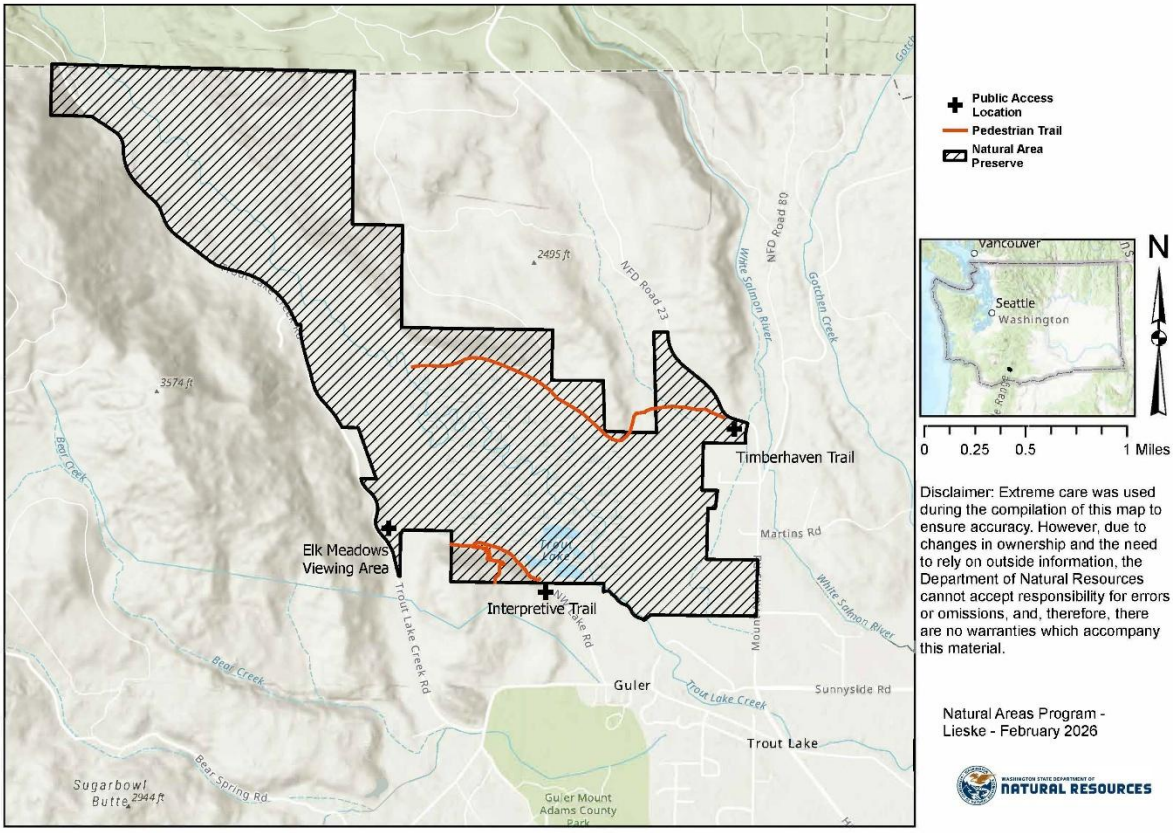
Additionally, DNR may conduct research and monitoring at natural areas to further conservation goals. Research or monitoring by DNR staff may draw upon the resources available within DNR's Youth Education and Outreach Program (YEOP) and similar community-based educational or scientific organizations. Advanced educational research or student internships may be available for hands-on learning opportunities in the fields of conservation land management and ecological restoration.

Objective: Monitor and manage access at interpretive and recreational trails and access points
Recreational access is limited to designated areas. At the time of development of this management plan, there are three designated public access sites at the NAP (Figure 1d). One site, referred to as the Interpretive Trail, located off Lake Road, provides public access to a 0.7-mile interpretive trail. There is also water access at the Interpretive Trail site, where visitors are permitted to launch non-motorized watercraft. This water access is closed seasonally from April 1 – June 1 to protect sensitive wildlife. Pedestrian public access is also permitted along the T4030 Road, referred to as the Timberhaven Trail. This permitted access point has a parking area, information kiosk, and a public restroom. This road will continue to be maintained for management access only by vehicles; however, public pedestrian access will continue to be allowed. The third access site is the Elk Meadows Viewing Area, located off Trout Lake Creek Road (FS-88). This site is near the Hollenbeck Barn, an historic barn that was included when the parcel was purchased by DNR. The barn is locked and secured and public access inside the structure is not permitted. This site also has a public restroom facility, some interpretive signage, and a wooden platform for viewing the seasonally flooded meadow, with a view of Mount Adams. Visitors can access the area by foot around a locked gate. Vehicle access is restricted to management personnel. All recreational uses, current and future, will be evaluated by DNR, as needed, and allowed pursuant to primary feature protection objectives and DNR policy.
Natural areas program staff will regularly monitor designated public access sites for:

- Encroachment of invasive weeds,

- Impacts of weed treatment drifting beyond the right-of-way,
- Impacts to sensitive species,
- Presence of trash,
- Unauthorized social trails and access points, which staff will then close and decommission,
- Evidence of recreational fire, and
- Other signs of activity that could threaten the integrity of the natural area.

Figure 4 Public Access Locations of Trout Lake NAP



Objective: Collaborate to Ensure that Tribal Practices are Consistent with Conservation Goals

The natural areas manager will work with Tribes to facilitate access for traditional cultural practices in a way that is consistent with the conservation goals of the site. Together with interested Tribal partners, an assessment will be conducted to determine whether and how specific traditional practices can be incorporated or accommodated at the site while staying consistent with the site's conservation goals.

Objective: Clearly Outline Limitations on Uses and Activities

Only activities and uses that are consistent with the conservation purpose of the Natural Area Preserves Act (RCW 79.70) are permitted.

Rules are posted on site and on the DNR website. Signs on site will be monitored and replaced as funding is available. DNR's existing law enforcement policies will apply. DNR will comply with applicable regulations in the management of Trout Lake NAP and will cooperate with local and state enforcement agencies when necessary to curb unauthorized use.

The following uses and activities are prohibited at Trout Lake NAP, as they conflict with conservation land management goals:

Creation of Unauthorized Social Trails and Off-trail Hiking – In accordance with WAC 332-52-405(1), creating unauthorized trails within the natural area is prohibited. Unauthorized trails are not built to standards that protect ecological features and are not known to site managers, therefore they are not patrolled, maintained, or monitored. A lack of monitoring and maintenance of such trails results in significant negative impacts to the vegetation on and adjacent to the trail as it becomes worn down and widened, including damage to or loss of sensitive plants. Social trails expose bare ground to invasive plants, create paths for water to travel and erode localized areas, and can lead to habitat fragmentation which can inhibit wildlife movement across the landscape.

Pets and Off-Leash Service Animals –Due to the sensitive nature of the plants and soils, and the potential for negative impacts and disturbances upon wildlife species, pets are not permitted within the preserve boundary, unless otherwise specified, such as at the established Interpretive Trail public access site and along the Timberhaven Trail. Pets are not permitted in Trout Lake Creek or the seasonal wetland areas of the NAP due to the sensitive nature of wildlife habitat. Service animals are permitted (WAC 332-52-140(1) but must be leashed at all times on any future designated trails or developed interpretive areas.

Hunting and Trapping within the NAP – Hunting and trapping are not approved uses for Washington's NAPs, including Trout Lake NAP. DNR does not allow species removal (hunting, trapping) from NAPs unless it is necessary for management purposes. The guiding principle for managing the NAP is to permit natural ecological and physical processes to predominate. Uses are limited to low-impact, non-consumptive use. Opening this small natural area to hunting can put at risk those features the site was designated to protect. Hunting can also negatively impact ecological research by violating assumptions about the influence of natural process on study results, introducing variation to the analyses, and damaging or eliminating monitored populations or plots from a sample area.

Exceptions may occur when a primary feature would be jeopardized without active intervention. Should the need to use hunting as a management tool arise, the DNR natural areas manager will consult with the Washington Department of Fish and Wildlife to define the parameters under which animal control methods may be allowed.

Removal (Harvest and Removal) of Plant or Mineral Material – In accordance with WAC 332-52-115(1a,b), the harvest and removal of any amount of plant or mineral material is not an allowable use, other than by DNR land managers for conservation purposes or with written permission from the natural areas manager or the natural areas program ecologists. Removal of mushrooms, firewood, tree boughs, and cuttings from shrubs are not allowed under this limitation of use.

Removal or Damage to Historical and Archaeological Objects, Features and Sites Significant archaeological and cultural resources are protected by state law concerning Archaeological Sites and Resources (RCW 27.53), the National Historic Preservation Act (P.L. 89-665 as amended) and the Archaeological and Historic Preservation Act of 1974 (P.L. 93-291). The removal or alteration of archaeological materials including artifacts, features, sites, and structures from DNR managed lands is not allowed, other than when carried out by DNR cultural resources staff or authorized individuals to protect the resource from loss or harm and/or conduct scientific analysis.

Dumping – In accordance with WAC 332-52-120 dumping is not allowed within Trout Lake NAP. Dumping results in trampled vegetation at the site, creates a sanitation risk, and can introduce invasive species.

Fishing – Fishing within the natural area is not an appropriate use of the site. The terrain is not conducive to establishing access trails or parking. Accessing these shoreline areas requires traveling across natural vegetation, and would cause damage to plant communities, and increase the potential for erosion and introduction of invasive species as soil is exposed in the creation of social trails.

Bicycles: Due to the potential for negative impacts to natural features, bicycles are not permitted within the NAP, including the designated public access sites.

Motorized boats: Motorized watercraft are not permitted to be launched at the Interpretive Trail site on Lake Road nor any other location within the NAP.

Seasonal/Temporary Closures: Water access at the Interpretive Trail is closed from April 1st – June 1st to protect sensitive wildlife. Temporary closures may occur at other access points and trails due to hazardous conditions or the presence of sensitive wildlife.

Other Uses Not Outlined Above – Uses and activities within Trout Lake NAP determined by DNR to be inconsistent with the conservation purpose of the Natural Area Preserves Act as outlined in RCW 79.70 are considered incompatible with conservation management and are not approved uses. Staff may address first encounters with people engaged in activities incompatible with conservation management as an opportunity for education rather than taking any formal action. DNR's existing law enforcement policies will apply. DNR will comply with applicable regulations in the management of Trout Lake NAP and will

cooperate with local and state enforcement agencies when necessary to curb unauthorized use.

Goal 3: Manage the Site in Response to a Changing Climate

Natural areas play a significant role in ecological climate resilience. They are considered a key component in mitigating climate impacts and have a strategic role in protecting the biodiversity and natural heritage of Washington State. They provide environmental services, such as sequestration and storage of carbon, provision of habitat refugia for rare species, maintenance or improvement of water quality and watershed processes, and protection of rare plant communities and ecosystems.

Objective: Review and Adapt Management Practices as Needed to Address Impacts of Climate Change

In recognition of the importance of considering climate change in conservation planning, land management approaches may need to adjust to continue to preserve protected elements in state natural areas. Natural Areas Program land managers and ecologists regularly review and consider existing approaches to the following as a part of general site management at Trout Lake NAP:

- Conduct a hydrological assessment of the NAP and implement recommended actions identified through hydrological study.
- Collaborate with interested Tribal specialists and Washington Natural Heritage Program staff to inventory culturally significant plants in the natural area and determine their vulnerability and response to climate change,
- Review the adequacy of the natural area boundary to protect primary features against climate change,
- Consult available climate change vulnerability assessments applicable to the primary features of the site to identify primary concerns and potential management actions,
- The Natural Heritage Program Climate Change Vulnerability Index assessments for rare plants and Habitat Climate Change Vulnerability Index assessments for ecosystems (https://www.dnr.wa.gov/NHPclimate) are primary resources,
- Review invasive species management practices (including Washington Invasive Ranking System species assessment summaries),
- Review the need for prescribed fire on the landscape, and alternatives to fire as a tool to achieve similar ends,
- Review the balance between inherent ecological and scientific value and recreational use and update policies as needed,
- Review restoration targets informed by shifting climatic conditions. (see above, climate change vulnerability assessments),
- In consultation with Natural Areas Program and Natural Heritage Program scientists, review the use of certain species in restoration projects in light of ongoing climate changes to plants and insect pests, and,

- In consultation with Natural Areas Program and Natural Heritage Program scientists as well as the Natural Heritage Advisory Council, review the potential need for assisted migration of nearby native plant and animal species.

Goal 4: Minimize Impacts of Wildfire Management

Wildfire suppression in Trout Lake NAP focuses on protecting life, resources, and property, and will be conducted to the degree possible with Minimum Impact Suppression Tactics (MIST) to minimize impacts on conservation features. Where possible, natural fires (e.g., lightning-caused) may be allowed to burn naturally without suppression efforts and managed with a monitor-and-contain strategy. The objective is to contain the fire within the NAP, so long as that approach does not conflict with protection of life and property (See Appendix 1 for the "Wildfire Management Strategy for Trout Lake NAP").

Objective: Follow the Wildfire Management Strategy Emphasizing Minimum Impact Suppression Tactics

Sensitive areas identified on maps should be avoided whenever possible, particularly for use of retardants or heavy equipment. After fires have been suppressed, the need for site restoration will be assessed and, if determined necessary, supervised by the region natural areas manager in consultation with the natural areas program ecologist.

Goal 5: Control Invasive Species

For the purposes of this management plan, an invasive species is a plant or animal species that is not native to the State of Washington and poses a threat to site management goals. Invasive species can repress or exclude native species, significantly alter succession, and are widely viewed as one of the greatest threats to ecosystem health and biodiversity worldwide. Useful sources of information on invasive species ecology, control, and ecological impacts include state and county weed control board information, Invasive Species Profiles (Click here for Invasive Species Profiles), Center for Invasive Species and Ecosystem Health (Click here for the Center for Invasive Species and Ecosystem Health), and the *Washington Invasive Ranking System* (Ramm-Granberg et al., 2024). This information can be used to identify species that may be potential threats to the site as well as to help prioritize species for control.

The other species of concern should be addressed through documentation and treatment of nascent populations and the containment and control of established populations. In addition to ongoing vegetation surveys, monitoring for invasive species should focus on roadside buffers, forested edges and riparian areas, as well as areas affected by future management activities, especially those that will create light gaps in the overstory and soil disturbance in the understory.

Invasive Plants

Inventory, assessment and control of invasive weed species are top priorities in the management of the preserve. The priority species are those that are considered able to invade the interior of the preserve and have the greatest potential to alter the native ecosystem. The other species of concern are typically found on disturbed soils and do not appear to be expanding into the undisturbed areas.

Priority weed species of concern include:

- Reed Canarygrass (*Phalaris arundinacea*)
- Diffuse Knapweed (*Centaurea diffusa*)
- Yellow Toadflax (*Linaria vulgaris*)
- Houndstongue (*Cynoglossum officinale*)
- Canada Thistle (*Cirsium arvense*)
- Bull Thistle (*Cirsium vulgare*)
- Sulfur Cinquefoil (*Potentilla recta*)
- Tansy Ragwort (*Jacobaea vularis*)
- Meadow Knapweed (*Centaurea pratensis*)
- Spotted Knapweed (*Centaurea stoebe*)

Other weed species of concern include:

- Bittersweet Nightshade (*Solanum dulcamara*)
- Common Mullein (*Verbascum thaspus*)
- Dalmatian Toadflax (*Linaria dalmatica*)
- Scotch Broom (*Cytisus scoparius*)

Objective: Follow the Site Weed Management Plan and Coordinate with Partners to Reduce Overall Cover of Invasive Weeds.

Weed management techniques will vary seasonally based on target species physiology and to avoid unintended impacts to non-target species. Some combinations of mechanical and chemical approaches will be the primary tools. Species-specific approaches can be found in Appendix 10.

Invasive Animals

American bullfrog (*Rana catesbeianus***)** - Native to the eastern United States, the American bullfrog (*Rana catesbeianus*; formerly known as *Rana catesbeiana*) is a highly invasive species in the western U.S., Asia, Europe, and South America. A female bullfrog can lay up to 20,000 eggs at one time, compared to native frogs, which only lay 2,000 to 5,000 eggs. Bullfrogs will eat anything they can fit in their mouths, including their own young. They also aid in the spread of Ranavirus that is infecting native frogs internationally, as well as the chytrid fungus (*Batrachochytrium dendrobatidis*) which threatens native amphibians worldwide.

As of 2025, American bullfrogs have not been documented within the NAP.

Brook trout (*Salvelinus fontinalis***) –** In the Pacific Northwest, the eastern brook trout is a non-native invasive species that competes with native fish species. Introduced fish,

such as brook trout, prey on tadpoles, negatively affect overwintering habitat, and can significantly threaten Oregon spotted frog populations, especially during droughts (USFWS 2013).

Objective: Coordinate with WDFW to Monitor for American bullfrogs and brook trout on NAP.
Natural areas staff will routinely monitor areas of the NAP that are critical Oregon spotted frog habitat for the presence of American bullfrogs. In the event of an American bullfrog identified on-site, Early Detection and Rapid Response protocols will be followed to eradicate the invasive species from the site. Natural areas staff will also collaborate with WDFW to mitigate negative impacts of brook trout presence in Trout Lake Creek on native fish species.

Goal 6: Ensure the Persistence of Habitat Structure for Wildlife

The habitat within Trout Lake NAP supports a rich diversity of native wildlife species including: several bird species, insects, rainbow trout, resident coastal cutthroat trout, black-tailed deer, elk, black bear, river otter, mink, coyote, raccoon, bobcat, cougar, beaver, bats and other small mammals. More information about species location and abundance is needed to guide management actions under this plan, potentially including collaboration with WDFW biologists, volunteer site stewards or researchers.

Objective: Ensure the Goals for Protecting Primary Features are Met.
The wildlife protected in Trout Lake NAP is native to these natural ecosystems. Species presence may vary with diurnal, seasonal, or annual cycles. Even if a species is not documented at a specific point in time, the goal is to maintain habitat that can support that species when present. Protecting the primary ecosystem features of the site maintains the habitat that supports a diversity of wildlife including those identified by the Washington State Natural Heritage Plan as conservation priorities.

Per the adopted *Natural Area Preserve Public Access Policy* in Appendix 6, the removal of wildlife only occurs as a DNR-approved management action when necessary. No access is allowed for hunting or trapping.

Management Goals:

- Adhere to goals and objectives identified in USFWS Recovery Plan for Oregon spotted frog (USFWS 2024).
- Adhere to goals and objectives identified in WDFW Recovery Plan for the Sandhill crane (WDFW 2002).
- In adherence to the WDFW Recovery Plan for the Sandhill crane and the USFWS Recovery Plan for Oregon spotted frog, conduct an in-depth hydrological study to maximize benefits to cranes and Oregon spotted frogs.

Objective: Perform Selective Vegetation Management as Needed to Restore and/or Maintain Ecosystem Resiliency Consistent with Spotted Owl Conservation Goals.
Vegetation management treatments are encouraged to restore structural elements, restore heterogeneity within and among stands, and which increase resiliency to future fires and other disturbance events (USFWS 2011). Northern Spotted Owls, which were formerly widespread throughout western Washington and the east slope of the Cascade Range, are now rare throughout Washington, largely due to the competitive disadvantage to the more generalist barred owl and habitat loss due to timber harvest. Protections on federal (Northwest Forest Plan) and nonfederal lands (Forest Practice Rules) have reduced the amount of habitat loss due to timber harvest (Buchanan 2005). The NAP falls within the buffered distance of a Northern Spotted Owl Status 1 Circle, which is defined as "Pair Location". This determination is based on the detection of a pair of owls, a single adult with young, or young owls identifiable as Northern Spotted Owls. (taken from U.S. Fish and Wildlife Service 1991, 1992) Status 1 owl management circles are those locations occupied by territorial Spotted Owls that include the buffered distances around known owl site centers. Certain amounts (i.e. 40%) of suitable owl habitat within these "circles" were "generally assumed to be necessary to maintain the viability of the owl(s) associated with each…owl site center" (WAC 222-10-041(4)).

Per the adopted *Natural Area Preserve Public Access Policy* in Appendix 6, the removal of wildlife only occurs as a DNR-approved management action when necessary. No access is allowed for hunting or trapping.

Additional information about ecology, distribution, and threats associated with these rare species can be found in the following links:

- Northern spotted owl: https://wdfw.wa.gov/species-habitats/species/strix-occidentalis-caurina

Management Goal:

- Adhere to goals and objectives identified in USFWS Recovery Plan (USFWS 2011) and DNR's Habitat Conservation Plan for the Northern spotted owl (Washington DNR 1997) and HCP Amendment No. 1 (DNR 2004).

Goal 7: Protect Archaeological and Cultural Sites

The lands in and surrounding the preserve are known to have been inhabited or used by indigenous peoples and early settlers and may include important cultural resources. In compliance with Governor's Executive Order 21-02 (GEO 21-02) and in cases where natural area projects have a Federal nexus under Section 106 of the National Historic Preservation Act (NHPA), the State Department of Archaeology and Historic Preservation

records shall be reviewed prior to the implementation of any research, education, or management activity. Any alteration to an archaeological site would require a permit from the Department of Archaeology and Historic Preservation (RCW 27.44 and RCW 27.53). Confidential cultural data is protected and exempt from disclosure under RCW 42.56.300 to prevent looting and depredation of the artifacts. All employees working at Trout Lake NAP should become familiar with DNR's Inadvertent Discovery Plan (Appendix 13) to understand how to proceed if an artifact is found during the course of work.

Process for Historical and Archaeological Preservation

Natural areas managers will initiate informal Tribal consultation with affiliated Tribes and work with professional archaeologists to ensure cultural resource compliance with GEO 21-02. GEO 21-02 mandates that:

- DNR shall consult with DAHP and affected Tribes on the potential effects of projects on cultural resources proposed in state-funded construction or acquisition projects. Consultation should occur early in the project planning process and must be completed prior to the expiration of state funds for construction, demolition or acquisition,
- DNR shall take all reasonable action to avoid or mitigate adverse effects to archaeological sites, historic buildings or structures, traditional cultural places, sacred sites, or other cultural resources,
- DNR shall retain the responsibility to ensure an adequate consultation process and will be responsible for holding all records related to the Tribal consultation process. DNR will provide the records to DAHP to demonstrate completion of the Tribal consultation process,
- A cultural resources study may be needed before a project may proceed and DNR must consult with DAHP and the affected Tribes for the purpose of seeking agreement on studies,
- If an archaeological site, historic building or structure, or cultural or sacred place is identified during a study, DNR shall consult with DAHP and the affected Tribes. This consultation will focus on avoidance strategies or methods to minimize harm if the project poses a direct or indirect effect on cultural resources,
- In the case of historic buildings or structures, DNR shall develop mitigation strategies in consultation with DAHP and if requested, affected Tribes. For all other cultural resources including archaeological and historic archaeological sites or traditional and sacred places DNR may only develop mitigation strategies upon notifying DAHP and the affected Tribes that avoidance cannot be attained, and
- Mitigation strategies for archaeological, cultural and sacred sites shall be identified through consultation with DAHP and the affected Tribes.

In instances where DNR works in conjunction with a federal agency or under a federal nexus, natural area managers and professional archaeologists will work with the appropriate

federal agency on Section 106 requirements and compliance. Confidential cultural data is protected and exempt from disclosure under RCW 42.56.300 to prevent looting and depredation of the artifacts. Contact the DNR Southeast Region natural areas manager for more information.

Goal 8: Maintain Roads and Rights-of-Way

County roads and state highways, as well as DNR access roads, exist within the natural area boundary and current DNR ownership (Figure 1a). Maintenance of these roads and associated rights-of-way is conducted by the County and DNR and includes routine brushing and danger-tree management. Roads are the most intrusive elements within and adjacent to the preserve, serving as potential sources for waste dumping and the spread of noxious weeds. DNR will regularly monitor formal and unauthorized access points, the roadside rights of way along the perimeter of the site, and easement corridors.

Objective: Natural areas staff will routinely monitor roads and easement corridors for impacts that may affect the natural area if left unaddressed.

Natural areas program staff will regularly monitor roads and easement corridors for:

- Encroachment of invasive weeds,
- Impacts of weed treatment drifting beyond the right-of-way,
- Presence of trash,
- Unauthorized access points,
- Evidence of recreational fire, and
- Other signs of activity that could threaten the integrity of the natural area.

Objective: Natural Areas Managers Will Take Action to Investigate, Identify, and Rectify Issues when Observations Indicate that Impacts on Rights-of-Way may Affect the Natural Area.

When monitoring identifies an issue that could risk the site's ecological integrity or safety, the natural areas manager will take appropriate action to address it.

Management Goals, Actions, and Activity Details

Table 2. Management Guidance for Trout Lake NAP

Goal	Management Action	Activity Detail
Protect Primary Features	• Implement a strategy to protect the site's primary features based on reference conditions defined by the global and state element descriptions, species recovery plans, and other relevant information. • Gather and maintain information necessary for site management.	• Manage for highly invasive species. • Assess and prioritize areas for restoration to improve condition of the mid elevation wetland to support key species. • Restore appropriate vegetation in areas impacted by use. • Pursue funding and facilitate partnerships to meet site management needs. • Encourage research on priority topics to assist with site management. • Pursue Tribal collaboration on restoration activities. • Manage for short-stature, non-shading vegetation in the OSF breeding areas (i.e., similar to early successional conditions). <u>Priority Research Topics</u> • See Appendix 8
		Highest Priority Monitoring Needs • Monitor habitat conditions for primary species using ecological monitoring techniques including supplementary long-term plots. • Monitor rare plant populations via census or plot sampling. • Monitor site use and associated impacts.

Goal	Management Action	Activity Detail
		• Regularly monitor roads and utility corridors for incursions into the preserve. • Monitor invasive species distribution. • Conduct annual Oregon Spotted Frog egg mass surveys throughout the site. • Monitor Sandhill Crane nest sites. • Monitor habitat conditions for Northern Spotted Owl Additional Monitoring Needs • See Appendix 9
Provide and Manage Access	• Foster environmental education. • Monitor potential impacts to natural features from site uses.	• Develop a sign plan for entire site. • Sponsor educational field trips for community members. • Determine if and where public access may be appropriate. • Coordinate with DNR Youth Education and Outreach Program to connect with interested education groups for interpretive site visits, service projects, research and monitoring.
Manage Site for a Changing Climate	• Address key non-climate stressors to maintain a healthy ecosystem. • Monitor primary features and species. • Monitor invasive species. • Encourage research on priority topics to assist with site management.	• Manage for highly invasive species. • Regularly monitor roads for incursions into the preserve, and for invasive weeds. • Assess and prioritize areas for restoration to improve condition of rare primary plants relative to reference conditions. <u>Highest Priority Monitoring Needs</u> • Conduct ecological monitoring of species populations and primary ecosystem functions.

Goal	Management Action	Activity Detail
		• Monitor invasive species distribution. <u>Additional Monitoring Needs</u> • Revisit restoration site at 5-year intervals. <u>Priority Research Topics</u> • Climate change impacts on plant community composition and wetland.
Minimize Impacts of Wildfire Management	• Follow the Wildfire Management Strategy emphasizing Minimum Impact Suppression Tactics.	• Coordinate with Incident Management team in event of wildfire threats to the natural area. • Meet annually with the local DNR fire staff prior to fire season to discuss the purpose of the site and the desire for MIST techniques. • Conduct regular updates to the Southeast Region Fire Mobilization Guide.
Control invasive Species	• Follow site-specific weed management plan.	• Conduct annual invasive species control measures • Monitor for the presence of bull frogs and other invasive animal species
Ensure the Persistence of Habitat Structure for Wildlife	• Protect the primary features to maintain them to support wildlife species.	• Maintain the general structure of a healthy wetland and upland habitat to support the wildlife that depends on the resources of that site.
Protect Archeological Sites and Cultural Resources	• Coordinate with Tribes to ensure that cultural sites are not disturbed and to gather their input and	• Establish primary contacts for outreach about DNR projects and management activities. • Learn about Tribal interests and concerns.

Goal	Management Action	Activity Detail
	exchange information about the preserve. • Follow the process for historical and archaeological preservation outlined in Goal 7.	• Consult with Tribes and Archaeologists on cultural resources reviews for projects. • Follow mandated state and federal processes for Tribal consultation.
Maintain Roads and Rights-of-Way	• Monitor roads for impacts that may affect the natural area if left unaddressed. • Investigate, identify and rectify issues when observations indicate that impacts on rights-of-way may affect the natural area.	• Monitor roads for invasive weeds and treat as necessary.

Routine Management Actions in Appendix 2
Routine management actions, the work required to steward the site on a daily basis exclusive of significant project-related work that requires special fiscal appropriation, are described in Appendix 2. A reasonable base budget for routine management of Trout Lake NAP will support a DNR land manager for 6 months per biennium, and two natural areas stewards for 6 months each per biennium. This includes all site-related costs such as travel and materials. A list of actions required to accomplish the routine site management, and an estimate of necessary DNR staff time is presented in Appendix 2, Table 2-1.

Costs associated with managing Trout Lake NAP are expected to change over time due to general economic factors (such as inflation), identification of new land and resource management challenges, or newly identified opportunities for research, environmental education, or access. DNR pursues a variety of state and federal grant funding to assist with land and resource management, restoration, research, and development of access and educational facilities. This includes educational curricula and materials created by DNR's Youth Education and Outreach Program for use at this site.

Near-Term Project List in Appendix 3
Near-term projects, which typically require special fiscal appropriation beyond that available for routine operations, are described in Appendix 3. The one-time projects noted in Appendix 3 should be pursued to complete necessary planning and make investments in land management, access, or capital budget projects. An estimate for the level of investment required to accomplish these projects is presented in the description, along with an estimate of DNR staff time that will be assigned in Appendix 3 Table 3-1.

Cost estimates are expected to change over time due to general economic factors (such as inflation) or implementation challenges. DNR pursues a variety of state and federal grant funding to assist with project implementation.

Duration of this Management Plan
This management plan, the routine management actions, and the near-term projects will be reviewed as necessary and updated by the DNR Natural Areas Program. Significant changes in management direction or policy guidance will include consultation with the Natural Heritage Advisory Council and may require revisions to the management plan and appendices. Such significant changes are expected to happen infrequently. The list of near-term actions will be updated as needed based on the cost factors noted above. Updates to Appendices 2 and 3 that maintain the management direction for Trout Lake NAP as stated in this adopted plan may proceed without additional review by the Natural Heritage Advisory Council.

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APPENDICES

The appendices for this document are in various stages of development and may include placeholders for material that is in development. Note that Appendices 2 and 3 may be updated with each state budget cycle. When finalized, Appendices 4-14 will be available on the Trout Lake NAP website at Trout Lake Natural Area Preserve | Department of Natural Resources.

APPENDIX 1 WILDFIRE MANAGEMENT STRATEGY
Trout Lake NAP

Management Goal 4 highlights the need to use Minimum Impact Suppression Techniques (MIST) when fighting wildfires. This appendix provides specific guidance for implementing MIST.

Management Jurisdiction
Fire suppression on the natural area is the responsibility of the DNR's Fire Control Program. DNR's Fire Control Program is responsible for fires on the non-federal, unimproved portions of Klickitat County where the natural area is located. Portions of Trout Lake NAP fall within the Klickitat County Fire District 1 boundary. For questions regarding the Wildfire Management Strategy please contact the natural areas manager (Appendix 11).

Ignition Sources
Potential ignition sources include cigarettes thrown from vehicles or by site visitors, parked vehicles, blowing cinders from nearby fires, and lightning.

Preferred Suppression Tactics
Minimum Impact Suppression Tactics (MIST) should be employed when conditions allow. Avoid sensitive areas marked on maps, especially when using retardants or heavy equipment. These sensitive areas are primarily located within Trout Lake Creek and the wetlands (Figure 1c). Site specific information is included in the Southeast Region Natural Areas Mobilization Guide provided by Natural Areas Program staff as needed. Preferred fire suppression tactics include:

- When safe and reasonable, use natural fuel breaks or control lines outside the natural area boundary for fire suppression.
- Water and hand tools should be used to stop the spread of wildfire, except under extreme conditions or if an improved structure is threatened. Crews should use a mist (instead of straight stream) water application where possible.
- Avoid drafting water from Trout Lake Creek and wetlands on the natural area to minimize impact to sensitive species.
- Helicopter landing areas and fire camps shall not be established within the natural area.
- Under extreme conditions or when structures are threatened, use foam or retardants instead of bulldozers.
- Fire vehicles will be confined to roads and, when applicable, bulldozed fire trails,
- Trees and snags will not be felled unless they pose a threat to firefighters.
- Location, extent, and type of mop-up activity will be determined by the Incident Commander in consultation with Natural Areas Program staff. Minimize mop-up activities in sensitive areas identified on maps and reduce soil disturbance by using water when possible.

After fire suppression, the region natural areas manager will supervise site restoration in consultation with the Natural Areas Program statewide ecologist.

Site Representatives
If wildfire involves or threatens the natural area, contact the following DNR personnel in order of proximity to serve as consultants to the Fire Incident:

Natural Areas Manager, Southeast Region
509-607-1851

Natural Areas Program Statewide Ecologist, Recreation, Conservation & Transactions Division
360-902-1600

Updated Natural Areas Program staff lists are available in Appendix 11 and on DNR's website at:

https://www.dnr.wa.gov/managed-lands/natural-areas

In the event that coordination with the local fire district is required, staff can coordinate with:
Klickitat County Fire Protection District 1 – 509-395-2043
For emergencies dial 911.

If the incident occurs after normal working hours, contact emergency services #911. Emergency services will contact the DNR Southeast Region standby staff, who will then contact a Natural Areas Program representative from the above list at home.
The representative will inform the Incident Commander of:

1. The purpose of the natural area,
2. The management objectives for the primary features of the natural area, and
3. The need to employ MIST fire suppression techniques when possible. The Incident Commander should contact the Region representative or the Division before beginning mop-up activities within the natural area.

Post-Fire Rehabilitation: In the event of a wildfire, the Natural Areas Program statewide ecologist will determine whether revegetation is required to protect ecological features of the natural area. If revegetation is deemed necessary, the natural areas ecologist will develop a plan according to the Wildfire Rehabilitation Guidelines below, and any restoration costs above and beyond erosion control measures typically implemented by Fire Control will be

the responsibility of the Natural Areas Program. Ensure that Southeast Region Wildfire personnel are informed of the natural revegetation policy of the Preserve.

Wildfire Rehabilitation Guideline(s):

- Allow the preserve to regenerate naturally without human intervention following wildfires.
- Implement post-fire revegetation only if natural regeneration is significantly impeded, threatening ecological features or processes.
- Restore areas with significant soil disturbance (berms, fire lines) by returning soil to its original location.
- Consult with the natural areas ecologist before undertaking any soil rehabilitation or revegetation efforts.
- Use only native plants or seeds sourced as close to the site as possible for any necessary revegetation. Species, ecotypes, and genotypes that could be adaptive for changing climate may be considered for inclusion in revegetation with approval by the Natural Areas Program Ecologist.
- Short-term, transient non-native plants may be used only if the natural areas ecologist determines they are warranted.

Implementation: Ensure that Southeast Region personnel are informed of the natural revegetation policy of the Preserve. In the event of a wildfire, the natural areas ecologist will determine whether revegetation is required to protect ecological features of the preserve. Natural recolonization by native vegetation is the preferred restoration strategy when damage to vegetation has occurred. Revegetation (planting or reseeding with native vegetation) will only occur if natural recolonization is impeded by factors such as lack of seed source and proliferation of exotic weed species, or if extreme soil erosion presents a threat to natural features or processes. If revegetation is deemed necessary, a plan will be developed by the natural areas ecologist, and any restoration costs above and beyond erosion control measures typically implemented by Fire Control will be the responsibility of the Natural Areas Program.

The Role of Fire in the Development and Maintenance of Native Ecosystems at Trout Lake NAP:

The native ecosystems at Trout Lake NAP are maintained by disturbance resulting from flooding in the wetlands, and fire in the uplands. The pre-settlement upland landscape was diverse, characterized by low-density, open canopy forest, dominated by large fire- and drought-tolerant trees, with pockets of higher density forest, and smaller openings without trees. This diverse landscape was maintained by frequent, low- and mixed-severity fires, with small patches experiencing high-severity fire impacts. Fires were caused by lightning from spring through fall, and also managed intentionally by Tribes. Historic fire frequencies for the “Dry Grand Fir” forest of the NAP are estimated at 50-100 years, with a relatively even mix of low-or moderate-intensity burns (underburning) and high-intensity burns

(crown fire). Estimates also indicate that “medium-sized” fires of 10-1,000 acres may have been the most common (Evers et al. 1994; Rocchio & Crawford 2015). On the majority of the site, which consists of wetland communities, fires probably would have only burned in the driest areas, reducing their overall effect on the site. Fires typically would have burned only into the perimeter and become extinguished when wetter areas were encountered. In dry years, fires could have burned well into the forested wetlands and occasionally into the more upland portions of shrub, grass or sedge dominated communities. Fires may have played a significant role in the distribution of age classes and structural stages of forested wetland communities but probably were not an important determinant of the composition or distribution of other wetland communities. Frequent fire controls vegetation in the understory, preventing the buildup of fuel on the forest floor that can result in ecologically damaging, higher intensity fires. In a natural forest, low intensity fires create self-maintaining landscape and species diversity. Habitat and species diversity are important components in healthy forest ecosystems, providing habitat and food resources for a diversity of insects and animals. Due to the proximity of residences and roadways, prescribed fire may not be a preferred tool for managing the upland habitats at Trout Lake NAP. Other tools, such as stand thinning and understory maintenance can be used to achieve similar conditions achieved from fire.

APPENDIX 2 Routine Management Actions for Trout Lake NAP

A reasonable base budget for routine management of the NAP will support Southeast Region Natural Areas Program staff including all costs related to the site such as travel and materials. Funding typically comes in the form of the Natural Areas Program biennial state budget.

Costs associated with managing Trout Lake NAP are expected to change over time due to general economic factors (such as inflation), identification of new land and resource management challenges, or to meet newly identified opportunities for research, environmental education or access. DNR pursues a variety of state and federal grant funding to assist with land and resource management, restoration, research, and development of access and educational facilities, including development of educational curricula and materials by DNR's Youth Education and Outreach Program for use at this site.

Definitions:

- "Biennium" refers to the State of Washington two-year budget cycle beginning on July 1 during odd calendar years and ending on June 30 in the next odd calendar year. (Example: July 1, 2025 through June 30, 2027)
- "Program" refers to the DNR Natural Areas Program unless otherwise stated.
- Operating budgets are the biennial state funding appropriations to state agencies.
- Capital appropriations are for specific projects funded by legislative appropriation.
- "Staff Months" are approximate hours of effort, whether applied to one individual or cumulatively to a team of individuals, to complete a task. (Example: 1.0 staff month would be approximately 176 hours for one individual for one biennium, or it could be 88 hours for two individuals; 88 x 2 = 176)
- "EIA" refers to Ecological Integrity Assessments that rank the condition of conservation features

Table 2-1. Routine Management Activities List Created January 2026

Activity	Description	**Estimated Staffing and Resources Required** with Potential Fund Source
Invasive Species Control	Follow site weed management plan.	0.5 staff months per biennium for a natural areas manager 2.0 staff months per biennium for natural areas specialist Potential Funding: Program operating budget; Washington Conservation Corps crew allocation

Activity	Description	**Estimated Staffing and Resources Required** with Potential Fund Source
Ecological and Adverse Impacts Monitoring	• Invasive species distribution mapping and treatment monitoring • Rare plant population monitoring • Impacts of uses in developed access areas and unauthorized trails • Impacts from unauthorized uses, such as dumping, off-roading, or theft • Wetland and riparian monitoring • Conduct annual monitoring of Oregon spotted frog egg mass • Conduct annual survey of Sandhill Crane nest.	1.0 staff month per biennium for a natural areas manager 3.0 staff months per biennium for natural areas specialist 0.5 staff month per biennium for the eastside assistant ecologist Potential Funding: Program operating budget
Environmental Education	• Work with YEOP to look for opportunities to host guided educational tours and activities for students. • Work with YEOP to look for ways the public can be involved with community science projects. • Host guided nature tours • Support education and outreach opportunities to the local community	0.5 staff month per biennium for a natural areas manager 2.0 staff months per biennium for planning and outreach specialist and natural areas specialist Potential Funding: Program operating budget

Activity	Description	**Estimated Staffing and Resources Required** with Potential Fund Source
Access Facilities Assessment and Maintenance	• Conduct assessment of appropriate access options • Annual maintenance of trails and CXT • Address unauthorized public use concerns as needed.	1.0 staff month per biennium for a natural areas manager 2.0 staff months planning and outreach specialist and natural areas specialist Potential Funding: Program operating budget; Program capital appropriation, Washington Conservation Corps crew allocation

APPENDIX 3 Near-Term Project List for Trout Lake NAP

The one-time costs noted in Table 3-1 below, should be pursued to complete necessary planning and make initial investments for site management, restoration, and enhancement. This list of projects is revised to propose priorities for each biennium, perhaps planning across two biennia.

Costs associated with managing Trout Lake NAP are expected to change over time due to general economic factors (such as inflation), identification of new land and resource management challenges, or to meet newly identified opportunities for research, environmental education or access. DNR pursues a variety of state and federal grant funding to assist with land and resource management, restoration, research, and development of access and educational facilities, including development of educational curricula and materials by DNR's Youth Education and Outreach Program for use at this site.

This initial project list will be updated by the Natural Areas Program as projects are implemented and new activities or new costs are identified.

Definitions:

- "Biennium" refers to the State of Washington two-year budget cycle beginning on July 1 during odd calendar years and ending on June 30 in the next odd calendar year. (Example: July 1, 2025 through June 30, 2027)
- "Program" refers to the DNR Natural Areas Program unless otherwise stated.
- Operating budgets are the biennial state funding appropriations to state agencies.
- Capital appropriations are for specific projects funded by legislative appropriation.

- "Staff Months" are approximate hours of effort, whether applied to one individual or cumulatively to a team of individuals, to complete a task. (Example: 1.0 staff month would be approximately 176 hours for one individual for one biennium, or it could be 88 hours for two individuals; 88 x 2 = 176)
- "EIA" refers to Ecological Integrity Assessments that rank the condition of conservation features

Table 3-1. Priority Project Needs for Trout Lake NAP as of January 2026.

Activity	**Description**	**Estimated Staffing and Resources Required** with Potential Fund Source
Forest management	• Conduct forest assessment on all forested parcels • Implement forest restoration actions as needed.	1.0 staff months per biennium for natural areas manager 3.0 staff months per biennium for natural areas forester 1.0 staff months per biennium for program ecologist Potential funding: Program operating funds, Future restoration grant from Recreation and Conservation Office
Archaeological Sites and Cultural Resources	• Conduct survey of areas where we will have ground disturbance during a restoration project, demolition • Conduct desk audit for cultural resources with the purchase of new parcels	1.0 staff month per biennium for a DNR archaeologist Potential Funding: Program operating budget; Program capital appropriation; grant(s) from the Recreation and Conservation Office
Public use	• Site assessment for interpretative trail and signs • Standardize and increase regulatory signs and site maps • Plan and implement new trails as needed • Develop interpretative signs	1.0 staff months per biennium for a natural areas manager 3.0 staff months per biennium for planning and outreach specialist Potential Funding: Program operating budget, Program capital appropriation, Future grant from Recreation and Conservation Office

	for educational trails • Evaluate access points and limit access from unauthorized use to sensitive areas • Remove infrastructure (i.e. pit toilet, picnic table, fire rings) at Camp Backus • Work with agencies and partners to recommend alternative recreation opportunities outside of the NAP.	
Wetland condition	• Conduct hydrologic assessment • Implement recommended actions from hydrologic assessment	2.0 staff months per biennium for natural areas manager 1.0 staff months per biennium for program ecologist Contractor: Assessment= $60,000, Implementation= $300,000 Potential Funding: Program operating funds, Future restoration grant from Recreation and Conservation Office

APPENDICES 4 through 14 are under development

These appendices will be posted online as they are completed: https://dnr.wa.gov/natural-areas/natural-area-preserves/trout-lake-natural-area-preserve

Appendix 4: Natural Features Summary
Appendix 5: Biotics Data
Appendix 6: Public Access Policy.
Appendix 7: Science, Research and Monitoring History
Appendix 8: Research Needs in Support of Site Management
Appendix 9: Management Goals and Actions for Priority Features
Appendix 10: Invasive Species Treatment Plan
Appendix 11: Natural Areas Staff Contact Information
Appendix 12: Restoration Planning and History
Appendix 13: Inadvertent Discovery Plan

The Natural Areas Program protects high quality examples of Washington's native ecosystems and rare species at Natural Area Preserves (NAPs) and Natural Resources Conservation Areas (NRCAs). These sites are designated for conservation, education, and research, with opportunities at NRCAs to enjoy these scenic landscapes through low-impact recreation.

www.dnr.wa.gov/managed-lands/natural-areas