



STATE OF WASHINGTON NATURAL HERITAGE PLAN

.....
2018
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WASHINGTON STATE DEPT OF
**NATURAL
RESOURCES**
HILARY S. FRANZ
COMMISSIONER OF PUBLIC LANDS

ABOUT THE COVER PHOTOS

Public agencies, private groups and individuals work together to protect Washington's rich and varied natural heritage for current and future generations through the creation of a Statewide System of Natural Areas.

Clockwise from top:

Bald Hills Natural Area Preserve (NAP)

Birdwatchers at Woodard Bay Natural Resources Conservation Area (NRCA)

Sandhill Cranes at Klickitat Canyon, NRCA

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Dear Reader:

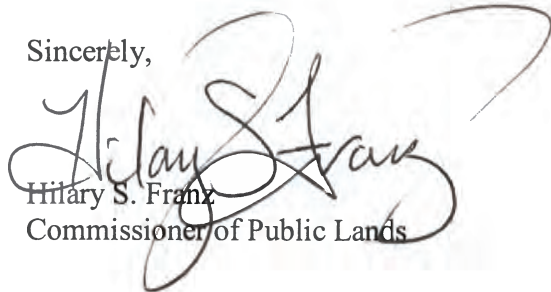
Washington is rich with an incredible diversity of natural resources, including species and ecosystems that occur nowhere else on earth. However, this natural heritage is at risk from various threats, including development pressure and climate change. Establishing Natural Areas not only protects our state's native biodiversity, it also provides opportunities for environmental education, scientific research, and places for people of all ages to connect with nature.

The 2018 *State of Washington Natural Heritage Plan* is an important tool to guide conservation efforts in the state. This plan describes the Statewide System of Natural Areas, including the priorities and processes by which new Natural Areas are identified and approved.

Through the years, the Department of Natural Resources has partnered with other state and federal agencies and private conservation organizations to build an impressive statewide system of Natural Areas. The lands we have protected represent the finest natural, undisturbed ecosystems in Washington, and often provide protection for our rarest and most vulnerable plant and animal species. But the work of identifying and conserving our natural heritage is not complete and success will not be achieved by DNR alone.

We invite you to help us build on this conservation legacy. We seek partnerships with agencies and land trusts to fill the gaps that exist in knowledge and conservation action. We encourage school districts and individual teachers who are interested in providing outdoor learning experiences to contact us. We want planners and decision makers to understand how we identify and classify species and ecosystems that are priorities for conservation, and the process by which we designate new Natural Areas. Ultimately, we intend to increase the awareness, appreciation and educational use of the special places that make up The Statewide System of Natural Areas and of the valuable information and support we can provide to others

Sincerely,



Hilary S. Franz
Commissioner of Public Lands

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Cypress Island NRCA



Why Create a Natural Heritage Plan?

The Natural Area Preserves Act (Revised Code of Washington, Chapter 79.70) requires that the Washington Natural Heritage Program develop the *State of Washington Natural Heritage Plan* to identify conservation priorities and the processes by which potential Natural Areas are selected and approved.

This *Plan* lays the foundation and context that will help guide conservation of biodiversity in the state of Washington for people and nature.

The *Natural Heritage Plan* also highlights additional conservation tools the Washington Natural Heritage Program and Natural Areas Program use to expand the impact of the Natural Area Preserves and Natural Resources Conservation Area Acts (RCW 79.70, RCW 79.71).

Role in Agency Planning

This *Plan* meets requirements of the Recreation and Conservation Funding Board to create a comprehensive plan to maintain eligibility for funding through the Washington Wildlife and Recreation Program (WWRP). The priorities and conservation ranks published as part of the *Plan* also serve to guide other federal, state and local conservation actions throughout Washington state.





Monte Cristo NAP

"It is, therefore, the public policy of the State of Washington to secure for the people of present and future generations the benefit of an enduring resource of natural areas by establishing a system of natural area preserves, and to provide for the protection of these natural areas."
Revised Code of Washington, Chapter 79.70; Natural Area Preserves Act

What you will find in this plan

- The processes of assigning priorities to species and ecosystems and selecting sites for addition to the Statewide System of Natural Areas.
- Information about the Statewide System of Natural Areas including the different types of land included in the system.
- Efforts by the DNR Natural Heritage and Natural Areas Programs to expand the impact of the Natural Area Preserves and Natural Resources Conservation Areas Acts.

Introduction

The diversity and beauty of Washington's landscapes, ecosystems, and species define the state. Washington is home to more than 3,100 vascular plant species, 140 mammals, 470 freshwater and marine fishes, 341 birds, 25 amphibians, 21 reptiles, thousands of mosses, lichens, liverworts, and fungi, and tens of thousands of invertebrates. Some of these species occur nowhere else on earth. For example, 86 plant species are unique to the state.

Although Washington is rich in biodiversity, we cannot take the continued existence of that diversity for granted. Many of our native species and ecosystems are facing stresses, including land conversion (agricultural, residential, commercial), invasion by non-native species, and the impacts of climate change.

In passing the Natural Area Preserves Act in 1972, the Washington State Legislature recognized the need for, and benefits of, permanently designating areas explicitly for conservation. These benefits include, among others, providing habitat for rare and vanishing species and ecosystems, and ensuring the availability of places for scientific research and education. The act authorized the Washington Department of Natural Resources (DNR) to work with federal, state and local agencies and private organizations to establish and manage a Statewide System of Natural Areas. Today, this system consists of lands managed by numerous federal and state agencies, and private conservation organizations.

In 1981, the Legislature amended the Natural Area Preserves Act and established the Natural Heritage Program within DNR. The Natural Heritage Program was established specifically to provide an objective basis for establishing priorities for conservation actions. The Natural Heritage Program mandate was to:

- maintain a classification of the state's natural heritage resources,
- maintain an inventory of the locations of these resources,
- share this information with agencies, organizations and individuals for environmental assessment and land management purposes, and
- assist with the nomination and selection of sites for inclusion within the *Statewide System of Natural Areas*.

Today, the Natural Heritage Program continues to connect conservation science with conservation action by collecting, maintaining, and distributing data on rare species and ecosystems, as well as providing a number of other services and products in support of conservation in Washington.

The 1981 amendment to the Act also required the Natural Heritage Program to develop the State of Washington Natural Heritage Plan (“Plan”) to provide the framework for a *Statewide System of Natural Areas* by:

- identifying the criteria and process by which Natural Areas are selected;
- identifying priority species and ecosystems; and
- identifying the roles of government agencies and private and nonprofit organizations in Natural Area protection.

Since passage of the Natural Area Preserves Act in 1972, through amendments and evolution of guidance across nearly 50 years, the basic criteria and process for selecting Natural Areas remain the same—driven by the presence of priority species and ecosystems. However, since the completion of the first *Plan* in 1983, the science of conservation biology has advanced significantly. Our understanding of what it takes to truly conserve our native species and ecosystems has improved; we are paying more attention to how landscape context might affect the viability of the priority species and ecosystems present within a potential Natural Area. The threats to Washington’s species and ecosystems have also increased. The state’s population is currently more than 7 million, having doubled in the past 40 years. Climate change is expected to amplify the challenges of ensuring conservation of species and ecosystems within Natural Areas. Washington is already experiencing change – increased spread of some non-native weeds, increased chance of catastrophic wildfires, increased ocean acidity, increased extreme weather events, and reduced climate suitability for some species.

Many more agencies and organizations are involved in conservation today than there were in the early 1980s. By building new and strengthening existing partnerships, we have the opportunity to improve our knowledge about what is already protected on conserved and working lands, provide enhanced access for education and recreation, and improve the effectiveness and efficiency of conservation.

This 2018 edition of the *State of Washington Natural Heritage Plan* reflects current conservation science, as well as new approaches to most effectively and efficiently achieve conservation success.

Natural Areas provide ecosystem services

“Ecosystem services” can be thought of as “benefits of nature.” The ecosystem services provided by Washington’s Natural Areas include greenhouse gas and climate regulation, water regulation, nutrient filtration, habitat for pollinators, fish, and other wildlife, and opportunities for recreation and aesthetic appreciation.

The value of the ecosystem services provided by Washington’s Natural Areas have not been quantified, but it is expected to be substantial. For example, it has been estimated that at a minimum, the ecosystems within Thurston County provide \$608 million (Flores and others 2012) and the open spaces in the Central Puget Sound region provide \$11.4 to \$25.2 billion (Chadsey and others 2015) in economic benefits to the regional economy every year.

Due to their relatively undisturbed character, Natural Areas present opportunities for research on the ecosystem services provided by intact ecosystems. This information can be used as reference conditions for management and restoration of other lands.

Implementing the Natural Area Preserves Act

The Washington Natural Heritage Program brings objectivity to setting conservation priorities and selecting sites for potential Natural Areas designation.

The Natural Heritage Program's approach addresses three questions:

- **Classification:** What are the components of biodiversity that are of conservation concern?
- **Inventory:** Where do the various components occur?
- **Conservation Planning:** What needs to be done to protect the individual components?

Each question is asked again as more information is gathered, stressors and threats develop, and/or conservation actions take place to inform and improve our understanding of biodiversity conservation needs and the outcome of conservation actions. In addition, by evaluating areas for conservation action based on an objective standard, the efficiency of conservation is increased by prioritizing areas of highest conservation value (<https://www.dnr.wa.gov/NHPmethods>).

The Washington Natural Heritage Program is part of the NatureServe network (www.natureserve.org) that includes more than 80 natural heritage programs located in the U.S., Canada, Latin America, and the Caribbean. Information about species and ecosystems can be readily shared across the network because similar methodologies and data management standards are used by all network members, which increases the accuracy and utility of conservation data and, ultimately, the effectiveness and efficiency of conservation actions.



Classification: Identifying the components of biodiversity that are of conservation concern

What are the components of biodiversity that are of conservation concern?

Many plants and animals can be protected by preserving representatives of the major natural communities in the state. On the other hand, some species are so rare they might not be automatically included in an area of this type. The Natural Heritage Program uses the global and state ranking system developed by NatureServe to determine the conservation status of species and ecosystems (<http://www.dnr.wa.gov/NHPmethods>). Ranks are then used to set targeted priorities for building the Statewide System of Natural Areas according to criteria described in this section. This process produces a list of species and ecosystems that can be used to efficiently achieve conservation goals.

Species

The Natural Heritage Program applies the following considerations to identify priority levels for species of conservation concern:

- ***Does the species' distribution convey concern?*** More concern would apply to species that are locally endemic (occurring nowhere else) and populations that are peripheral (on the edge of the species' distribution) or disjunct (widely separated from other populations of the same species).
- ***Are demographic issues significant?*** These issues include small population size, declining population size, and poor reproduction.
- ***Are habitat issues significant?*** These factors include whether the amount of habitat is declining, if maintenance of the habitat depends on regular disturbance such as fire or flood, and if the habitat is restricted to a small geographic area.
- ***Is the species likely to be more or less common than the data indicate?*** Consideration is given to the amount of likely habitat that has been inventoried.

Natural Heritage Program staff, with input from external experts, rigorously review the lists of priority species. The lists can be found at <https://www.dnr.wa.gov/NHPspecies>.

Natural Heritage Plan Species Priority Rankings¹

Priority 1 (Highest Priority)

These species are in danger of extinction across their range, including Washington. Their populations are critically low or their habitats are significantly degraded or reduced.

Priority 2

These species are likely to become endangered across their range or in Washington within the foreseeable future.

Priority 3

These species are vulnerable or declining and could become threatened without active management or removal of threats to their existence.

¹For ecosystems, priorities are based on how well each is represented within existing Natural Areas, rarity, and degree of threat.

Why did the priority ranks change?²

Plants removed as a priority:

- change in taxonomy: 1 species
- improved status: 32 species
- more information needed: 4 species

Plants lowered in priority:

- change in taxonomy: 2 species
- improved status: 46 species

Plants added as a priority:

- improved knowledge: 56 species

Plants elevated in priority:

- declining status: 80 species

Animals removed as a priority:

- change in taxonomy: 1 species
- improved status: 1 species
- improved knowledge: 2 species

Animals lowered in priority:

- change in taxonomy: 1 species
- improved status: 2 species
- improved knowledge: 3 species

Animals added as a priority:

- improved knowledge: 12 species
- declining status: 5 species
- species reintroduced: 1 species

Animals elevated in priority:

- improved knowledge: 1 species
- declining status: 3 species

More complete explanations of the changes for each species are available in the lists at:

[https://www.dnr.wa.gov/](https://www.dnr.wa.gov/NHPspecies)

NHPspecies² Changes since the 2011 Natural Heritage Plan

Changes in the list of priority plant species

Every two years, a statewide community of botanists reviews the rare plant list by contributing sighting records, suggesting changes or additions, and sharing their professional judgment with the Natural Heritage Program. In 2017, 220 changes were made to the list of priority plant species.

Addition of the list of priority lichen and moss species

This is the first edition of the *Plan* to include priority lists of nonvascular species. Based on a review in 2011 by Northwest Lichenologists, the Natural Heritage Program has identified 52 priority species of lichens. Six priority species of mosses have been identified in Washington. These lists are likely incomplete because relatively little is known about the abundance and distribution of many of the species. The Natural Heritage Program will continue to pursue opportunities to partner with others to update these lists.

Changes in the list of priority animal species

The list of priority animals for conservation action is complete for vertebrate species and partially complete for invertebrate species. The primary factor limiting the evaluation of invertebrates is a lack of information on the abundance and distribution of many species. In 2017, 31 changes were made to the priority ranks of animal species. In addition, taxonomic changes were made for two species, without changes in priority.



Morning Star NRCA Photo by Jim Cahill

Ecosystems

Determining priorities for ecosystems involves two steps: (1) identifying all the types of ecosystems that occur in the state and (2) establishing their need for conservation.

Similar to species, several factors are considered when establishing statewide priorities for conservation of ecosystems:

- How adequately is the ecological community represented in the Statewide System of Natural Areas?
- How rare is the ecological community?
- What is the degree of threat to the ecological community?

The list of priority ecosystems can be found at <https://www.dnr.wa.gov/NHPconservation>. Ecosystems can occur in one or multiple ecoregions and are assigned a priority rank for each ecoregion in which they are located. The priority rank for any given ecosystem type may differ between ecoregions due to different levels of rarity and/or protection of that type among the ecoregions.

Washington's ecosystems are classified according to separate systems for marine and estuarine communities (Dethier 1997), wetlands (U.S. Natural Vegetation Classification; <http://usnvc.org/>, Rocchio & Crawford 2015, Kunze 1994), and terrestrial communities (USNVC). Using multiple systems creates challenges due to differences in the scale considered for classification units and gaps in classification for some ecosystems. Using multiple methods also creates nearly 1,400 classification units, which is not practical for regular review to set priorities.

To address the lack of consistency and improve the effectiveness of ecosystem conservation, the Natural Heritage Program is developing a simplified, unified classification for Washington. This classification applies to all ecosystems in the state, reduces the overall number of classification units, maintains enough resolution to capture biodiversity patterns, and reflects contemporary taxonomy. This new classification system is intended to be available for the next edition of the *Plan*.

The Natural Heritage Program is also updating the approach to determining priorities for ecosystems. Future versions of the *Plan* will clearly separate conservation ranking (rarity and overall condition of ecosystems) and representation ranking (how well-protected an ecological community is within the Statewide System of Natural Areas).

Ecoregions

Ecoregions reflect broad ecological patterns on the landscape. In general, each ecoregion has a distinctive composition and patterns of plant and animal species distribution. The ecoregion boundaries used by the Natural Heritage Program have been modified slightly from those developed by the U.S. Environmental Protection Agency (2000) to better reflect local conditions. For more information on Washington's ecoregions, visit <http://www.dnr.wa.gov/natural-heritage-program>.

Changes to the list of priority ecosystems

- **Pacific Coast ecoregion:** added Raised Bog as Priority 1
- **Canadian Rockies ecoregion:** added Calciferous Wetland as Priority 1
- **Multiple ecoregions:** raised low elevation freshwater wetlands to priority 1 in 7 ecoregions and priority 2 in 2 ecoregions.

Inventory: Determining where priority species and ecosystems occur

Where do the priority species and ecosystems occur?

Gathering, managing, and sharing ecological information and applying it to conservation planning is fundamental to establishing a Statewide System of Natural Areas. The Natural Heritage Program was created specifically to provide an objective basis for establishing priorities for a broad array of conservation actions. To do this, the program inventories the state's ecosystems and species, and gathers scientific data that can be synthesized into usable information to inform conservation decisions and actions by individuals, government agencies, and conservation organizations.

The Washington Natural Heritage Program currently tracks nearly 4,000 locations of more than 365 rare plant and nonvascular species. In an effort to keep the information as current as possible, the Natural Heritage Program partners with the Washington Rare Plant Care and Conservation (Rare Care) program at the University of Washington's Center for Urban Horticulture (<https://botanicgardens.uw.edu/science-conservation/rarecare/>). Through this partnership, trained volunteers revisit known populations, monitor the site's overall condition, and provide updated information to the Natural Heritage Program. Since several of the state's rarest plant species are listed or being considered for listing or delisting under the federal Endangered Species Act, the Natural Heritage Program provides the U.S. Fish and Wildlife Service (USFWS) with high quality data to inform these decisions, and coordinates with the USFWS to prioritize species for inventory, monitoring, and research projects.

Data collection by the Natural Heritage Program zoologist complements efforts by the Washington Department of Fish and Wildlife (WDFW). Recent projects include determining the extent of populations of the sand-verbena moth (a candidate for listing under the Endangered Species Act) and the diversity and distribution of fairy shrimp throughout the state.

The Natural Heritage Program also collects information on the distribution, abundance, condition, threats, and trends of rare and high quality ecosystems. The program currently tracks the location of 1,092 wetland and riparian communities and 1,348 upland communities. Marine and estuarine communities are not currently tracked by the program. Data on the locations of the tracked communities come from a variety of sources, including projects focused on specific community types and information provided by private, non-profit, and government collaborators.

Washington Natural Heritage Program data are available in various formats, including the Map Viewer of Rare and High Quality Wetlands of Washington State. More information can be found at <https://www.dnr.wa.gov/NHPdata>.

Conservation planning: Protecting species and ecosystems

What needs to be done to protect species and ecosystems? What are the conservation tools to help ensure this protection?

A variety of tools can be used to provide protection for rare species and rare and high quality ecosystems. This *Plan* focuses on acquisition and designation of land to build a Statewide System of Natural Areas, as established in the Natural Area Preserves Act (RCW 79.70) and the Natural Resources Conservation Areas Act (RCW 79.71, see "Types of Natural Areas Recognized in the Plan"). "Extending the conservation impact" (page 24) describes some of the other tools the Natural Heritage and Natural Areas Programs support, which include furnishing data to inform land-management policies and providing opportunities for education and research.

Identifying potential new Natural Areas

The species and ecosystem priorities established by the Natural Heritage Program guide the selection of potential additions to the Statewide System of Natural Areas, and inform the identification of key conservation acquisitions funded through the Washington Wildlife and Recreation Program.

A site generally becomes a candidate for designation as a Natural Area upon the discovery of a place that is in remarkably good ecological condition or is extremely valuable for the continued existence of a rare species or rare ecosystem. Some discoveries are made by Natural Heritage Program scientists during the course of their field work investigating priority species and ecosystems. In other cases, a Natural Heritage Program scientist verifies information provided by other state or federal agency employees, academic faculty or researchers, private conservation groups, or individuals.

Once a prospective Natural Area has been identified, it is assessed from two different standpoints: the occurrence of priority species and ecosystems within the site, and the integrity of the site as a whole.

Species and ecosystem occurrence analysis

Occurrences of priority species or ecosystems within a prospective site are assessed considering their overall condition and viability. For rare species and ecosystems, the goal of designating a Natural Area is to make a significant contribution to the long-term conservation of those species and ecosystems. For more common ecosystems, the goal of designating Natural Areas is to provide protection for the best remaining, least-modified examples. To that end, the degree to which the occurrence is a representative example of that





ecosystem type is also assessed. Factors considered during the species and/or ecosystem occurrence analysis include:

- **Size:** population size for rare species, and the area occupied by ecosystems.
- **Condition:** the appropriateness or quality of habitat for a species, the species composition of the ecosystem or habitat, and the functioning of natural processes within the ecosystem.
- **Landscape context:** the condition of the landscape surrounding and affecting the species or ecosystem occurrence.

Most prospective Natural Areas have more than one priority species or ecosystem. It is clearly a more efficient use of public and private resources to select sites with more than one priority feature, thereby potentially reducing the total number of sites necessary to adequately protect and represent biodiversity and ecosystem functions. However, in some cases, a single species or ecosystem may be sufficient to warrant establishment of a Natural Area.

Types of Natural Areas Recognized in the Plan

In passing the Natural Area Preserves Act, the Legislature emphasized that all lands within the state are "...subject to alteration by human activity..." except those lands that "...are expressly dedicated by law for preservation and protection in their natural condition..." (RCW 79.70.010). The **Statewide System of Natural Areas** includes Natural Area Preserves, Natural Resources Conservation Areas, Research Natural Areas, Areas of Critical Environmental Concern, and Biological Study Areas. (see "Washington's Natural Areas," page 18) Referred to in this *Plan* as **Natural Areas**, these sites emphasize conservation and scientific and educational use, and include federal, state, and private lands.

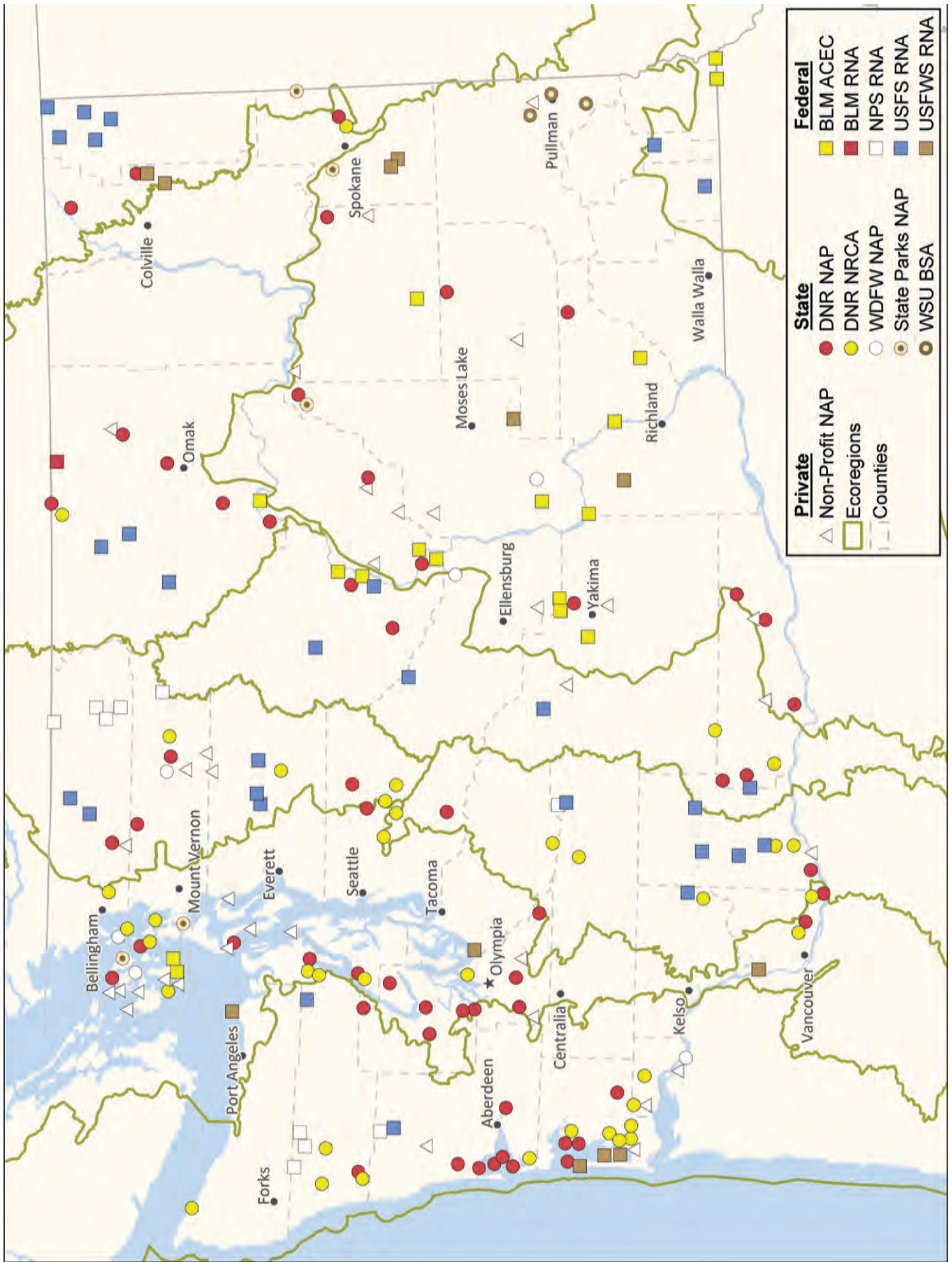
Natural Area Preserves protect the best remaining examples of many ecosystems including rare plant and animal habitats and provide opportunities for research and education; Natural Area Preserves are managed by DNR, WDFW, Washington State Parks and Recreation Commission ("State Parks"), and some non-profit land trusts.

Natural Resources Conservation Areas is a designation that is unique to DNR and may involve other conservation partners. These areas may provide the potential for development of low-impact recreation in addition to providing protection for priority species and ecosystems and opportunities for research and education.

The **Research Natural Area (RNA)** designation is used by the U.S. Forest Service, U.S. Fish and Wildlife Service, National Park Service, Bureau of Land Management, Department of Energy, and the Department of Defense; **Areas of Critical Environmental Concern (ACEC)** are designated by the Bureau of Land Management; and the **Biological Study Area (BSA)** designation is used by universities in Washington. RNAs, ACECs, and BSAs are established to protect important historical, cultural, and scenic values, fish and wildlife, or other natural resources, and are strictly managed for research and education. Thus, these areas provide a high degree of protection and are similar to Natural Area Preserves.

Many other land-use designations can contribute to the conservation of native species and ecosystems. National parks and wilderness areas, for example, are places where human-related impacts are minimized and native species and ecosystems are maintained in good ecological condition. However, such areas may have significant levels of recreation and other historical land uses, such as mining and grazing, and thus are not considered part of the Statewide System of Natural Areas. For further information, see "Extending the Conservation Impact" (page 23).

Washington's Natural Areas



Membership of the Natural Heritage Advisory Council

Members appointed by the Commissioner of Public Lands:

- Five recognized experts in the ecology of Natural Areas
- One private forest landowner (or representative)
- One private agricultural landowner (or representative)
- Three members-at-large

Director or designees of:

- Department of Natural Resources
- Department of Fish and Wildlife
- State Parks
- Department of Ecology
- Recreation and Conservation Office

Site analysis

The site analysis for potential Natural Areas emphasizes ecological quality, diversity, and ecological viability as characteristics of the site as a whole. The primary question that must be satisfactorily answered is: if designated, could the Natural Area be successfully managed through time to maintain the primary species and/or ecosystems? Factors assessed include:

- How fragmented is the landscape? How isolated is the potential Natural Area from other reasonably intact ecosystems?
- Are natural processes disrupted by site isolation or other factors? Can management activities be used to mimic natural processes such as fire?
- Is the site susceptible to effects from changing land uses on nearby lands? Would development of nearby lands have a significant negative impact, and if so, could this be avoided through site boundary design?
- What are the known management issues for the site? Is the control of invasive species a current or anticipated challenge in maintaining the site? Does current human use of the site create or introduce negative impacts to the site's conservation value?

The approval process

The three state agencies that manage Natural Areas (DNR, WDFW, and State Parks) follow similar processes to establish new Natural Areas. This process is briefly described below. Federal agencies and private organizations have their own processes for establishing protected areas. As described in "Types of Natural Areas Recognized in this Plan", the Natural Heritage Program may recognize some of these as Natural Areas if they provide a high level of protection for priority species and/or ecosystems.

The role of the Natural Heritage Advisory Council

The Natural Heritage Advisory Council ("Council") was established by RCW 79.70.070 to advise the land managing state agencies on implementation of the Natural Area Preserves Act.

The Council has 15 members, including five state agency representatives who serve in an ex-officio, non-voting capacity. Ten members are appointed by the Commissioner of Public Lands and serve four-year terms.

One of the primary functions of the Council is review of potential Natural Area Preserves. Based on the criteria for analysis described above, the Council may:

- recommend approval as proposed;
- reject as proposed; or
- modify a proposal by adjusting the boundary or changing the Natural Area category (e.g. recommending designation as a Natural Resources Conservation Area or combined Natural Area Preserve/Natural Resources Conservation Area).

The Council also provides guidance on the management of DNR Natural Area Preserves and Natural Resources Conservation Areas and revisions to the *Natural Heritage Plan*.

Public hearings

For Natural Areas that are proposed to be designated and acquired by DNR, a public hearing is held in the county in which the area is located, and local elected officials, neighboring landowners, and other stakeholders are provided an opportunity to comment on the proposal.

Natural Area approval

If supported by the Council, the recommendation for Natural Area designation and information gained from the public hearing is forwarded to the appropriate state agency head (the Commissioner of Public Lands, Director of WDFW, or Director of State Parks) for review and potential approval of the Natural Area boundary.

Acquisition

Purchases are made only from willing sellers and the purchase price is based on market value appraisals. Once a site boundary has been approved, funding is sought to acquire properties within the Natural Area boundary. If land is transferred out of state trust land status, the trust is compensated for the asset value and replacement land is purchased to provide ongoing income for the trust.



Mima Mounds NAP

Site-based Management Plans

Management of Natural Area Preserves:

- **10 sites:** Site-specific management plans
- **29 sites:** Interim management plans
- **17 sites:** Without a management plan, but management is guided by the needs of the species and ecosystems for which the Natural Areas Preserves were designated

Management of Natural Resources Conservation Areas:

- **8 sites:** Site-specific management plans:
- **29 sites:** Management under the 1992 NRCA Statewide Management Plan

DNR Natural Areas

In addition to setting the priorities for development of the Statewide System of Natural Areas, DNR plays a major role by managing Natural Area Preserves and Natural Resources Conservation Areas. DNR is the largest conservator of native ecosystems and habitat for rare species in Washington, protecting and managing 161,000 acres of Natural Areas as of June 2017. In addition, the Natural Heritage Program cooperates with federal, state, and local agencies, private organizations, and individuals to recognize conservation efforts through the Register of Natural Areas.

The DNR Natural Areas Program conserves Washington's native species and ecosystems, today and for future generations by focusing on:

Healthy ecosystems: Using science-based management and restoration techniques to prevent damage to healthy ecosystems and restore degraded ecosystems.

Biodiversity: Protecting Washington's native biodiversity by controlling invasive species, monitoring rare native species, and managing for the recovery of rare species populations.

Valuing nature: Strengthening public appreciation of nature by promoting environmental education, exploration, and scientific research on Natural Areas.

Fostering partnerships: Innovating ways to care for Natural Areas through community engagement and partnerships.

As of January 2018, DNR staff across the state manage 56 Natural Area Preserves and 37 Natural Resources Conservation Areas. Natural Areas Program staff based in Olympia provide guidance and scientific expertise and ensure consistency of management. When major management issues arise (e.g., reintroduction of a rare species to a site, introducing management techniques to mimic historical disturbances), they are brought before the Natural Heritage Advisory Council. Learn more about DNR's Natural Areas at <http://www.dnr.wa.gov/managed-lands/natural-areas>.



Prescribed fire at Camas Meadows NAP

Register of Natural Areas

As envisioned by the Washington State Legislature, DNR maintains a state register of lands that contain significant natural heritage resources. Many occurrences of federally listed and candidate plant species, and other high priority species, are on private lands where no formal protections are currently in place. Landowners registered in this system voluntarily manage the sites with conservation of the species in mind. The program is strictly voluntary and the landowner can opt out of the register at any time. For many rare species, these sites are potentially significant for the species' long-term conservation.

DNR Natural Area Preserves and Natural Resources Conservation Areas

Natural Area Preserves are acquired for the protection of the priority species and ecosystems they contain; management is primarily intended to ensure the viability of those species and ecosystems. For example, Upper Dry Gulch Natural Area Preserve in Chelan County protects the largest known population of Whited's milkvetch, a state-listed endangered plant species that is only found within a 3-square-mile area; it is found nowhere else in the world. Research and education are other primary intended uses of Natural Area Preserves. A few Natural Area Preserves also have developed trail access.

Natural Resources Conservation Areas often contain priority species or ecosystems and offer opportunities for research and education. They are also meant to provide the potential for development of low-impact recreation such as hiking, backcountry camping, and scenic photography. For example, Table Mountain Natural Resources Conservation Area contains relatively undisturbed examples of upland and wetland forests, mountain meadows, and rare plant populations, including the largest known population of Howell's daisy, a state-threatened plant that is only found in a small part of the Columbia River Gorge. A segment of the Pacific Crest Trail traverses the site, offering amazing vistas of both Washington and Oregon.

Some sites have both Natural Area Preserve and Natural Resources Conservation Area status. For example, Cypress Island, one of the first sites established under the Natural Resources Conservation Areas Act, is the largest relatively undeveloped island in the San Juan Island archipelago. Cypress Island protects more than 5,200 acres of high quality forest, wetland and grassland communities, state-owned tidelands, and low-elevation serpentine forest. The areas on the island designated as Natural Area Preserve comprise about 1,100 acres, and protect rare examples of grasslands underlain by basalt bedrock, and other plant communities and wetlands underlain by serpentine bedrock. The areas of the island designated as Natural Resources Conservation Area also protect important ecological features, and additionally provide low-impact recreation opportunities such as hiking, wildlife viewing, and shoreline camping.

Collaboration with Land Trusts

The impact of Washington's private, nonprofit land trusts on conservation has increased dramatically since the 2011 Natural Heritage Plan. By 2015, Washington's land trusts either owned or held easements on 224,430 acres, a 38% increase since 2010 (Land Trust Alliance 2015). Collaborations with the state's land trusts increase DNR's effectiveness and efficiency of conservation. For example, the Natural Heritage Program worked with the Columbia Land Trust to develop Ecological Integrity Assessment methodology for upland habitats and conduct assessments on the land trust's stewardship units (<https://www.columbialandtrust.org/land-with-integrity/>). The Natural Areas Program partnered with the Whidbey-Camano Land Trust to acquire the Admiralty Inlet Natural Area Preserve (<http://www.wclt.org/projects/admiralty-inlet-preserve/>) and continues to collaborate with the trust on on-going site management.

Extending the conservation impact

Using the Natural Area Preserves and Natural Resources Conservation Acts to establish Natural Areas is just one of the many conservation tools available to conserve Washington's natural heritage. The Natural Heritage and Natural Areas Programs engage in other efforts to conserve rare species and ecosystems, such as supporting agencies, organizations, and individuals.

Conservation land designations

Several land-use designations make significant contributions to the conservation of native species and ecosystems, but are not considered part of the Statewide System of Natural Areas. Some of these lands provide protection of species and ecosystems, while they are managed for timber production, grazing, and/or relatively high levels of recreation. Other protected lands lack priority species and ecosystems, but still provide important conservation values, such as connecting high quality habitat areas, contributing to landscape-level resiliency to climate change, and providing other ecosystem services, as well as serving as areas for outdoor recreation, enabling firsthand experiences with nature. The Natural Heritage Program is developing a process by which these other conserved lands can be recognized for the conservation values they provide.

Support for policies, laws, and regulations

The Natural Heritage Program has no direct regulatory authority. However, the data maintained by the Natural Heritage Program are used in the application of policies, laws, and regulations. In Washington, data provided by the Natural Heritage Program are used by the Department of Ecology in its wetland rating system and WDFW when assigning legal status to rare animal species.

Because natural heritage programs in all 50 states use the same ranking system, the policies, laws, and regulations based on natural heritage data can be applied consistently throughout the country. For example:

Federal sensitive species policies. The Natural Heritage Program provides the U.S. Forest Service and U.S. Bureau of Land Management with rare species data and documentation to support the global and state ranks assigned to each species. Both agencies use the global and state ranking to develop their lists of sensitive species that are used to guide management on their lands.

Forestry Certification Standards. The conservation status assigned to Washington's species and ecosystems by the Natural Heritage Program is used by the forest products industry to identify areas for protection under forest certification standards, such as the Sustainable Forestry Initiative.

Endangered Species Act. The U.S. Fish and Wildlife Service uses information provided by the Natural Heritage Program in listing and recovery decisions under the Endangered Species Act. Much of the information about locations and threats to species (particularly for plant species) originates with the Natural Heritage Program, and program scientists serve on advisory teams that develop plans for recovering species.

Natural heritage conservation in education

Natural Areas provide ideal outdoor classrooms. Natural Areas offer places to teach students about natural ecosystems, including the species and processes that make them special, and to apply lessons from fields as diverse as science, math, and art. In nature-based education, students become exposed to a variety of science-based and environmental management careers.

The Natural Heritage and Natural Areas Programs are exploring opportunities to increase the educational use of Natural Areas. These activities are likely to include working with land trusts to align language around the many values of Natural Areas and connecting K-12 schools to local Natural Areas. Ultimately, these activities are expected to increase the understanding and appreciation of the role of Natural Areas in relation to biodiversity, native ecosystems, ecosystem services, economics, and traditional and current human uses. Many of Washington's Natural Areas also provide an opportunity to connect people from different backgrounds to the cultural history of our landscape.

Providing opportunities for research

Scientists in the Natural Heritage and Natural Areas Programs conduct research projects and provide information and technical expertise to support other scientific research. The research conducted by program staff and others provides a better understanding of Washington's native species and ecosystems, and provides insight into the best ways to effectively and efficiently achieve conservation goals.

Natural Areas and the data managed by the Natural Heritage Program provide multiple opportunities for research. To date, more than 400 research projects have been conducted in Natural Areas managed by DNR. This research has included rare species monitoring and inventory; development of techniques to recover rare species populations and restore habitats; and investigations of geologic history and cultural resources. The high quality of Natural Area Preserves in particular provides a valuable opportunity to understand the structure and function of relatively intact ecosystems and serves as models for restoration and rehabilitation projects – increasingly important given the

Education in Natural Areas

In 2017, DNR hosted an event at Mima Mounds Natural Area Preserve where members from nine different tribes collected camas, a native food plant, and shared cultural stories with a diverse group representing universities, non-profits, industry, and government agencies. This information is being used to develop teaching modules and guidelines for the most productive approach to implementing cultural and ecological conservation across camas prairies. <http://conservation.uw.edu/current-work/camas-prairie-cultural-ecosystems-incubator/>

Fostering resilient landscapes and building resilient communities

The Statewide System of Natural Areas has grown steadily from the first designations of Sand Island and Goose Island as Natural Area Preserves in 1973. Today, there are 211 Natural Areas in the statewide system, including 68 in federal ownership, 108 in state ownership, and 35 in private conservancy. Washington's Natural Areas protect critical habitat areas, provide important ecosystem services that benefit our communities, and provide opportunities for education, research, and recreation. By taking bold steps, guided by sound policy and science, and in partnership with others throughout the state, it will be possible to fulfill the vision articulated in the Natural Area Preserves Act and create a Statewide System of Natural Areas for the benefit of current and future generations.

stresses of climate change, land use change, and invasive species. Potential uses of Natural Heritage Program data include investigating how species abundance and distribution have changed through time.

Improving outreach

Surveys of visitors to eight DNR Natural Areas during the summer of 2017 overwhelmingly showed that the Natural Areas met or exceeded visitor expectations (96% of 118 people surveyed). However, only 64% of these visitors were aware of the Natural Area designation, and fewer than half (47%) were aware that the Natural Area was managed by DNR, or even by state government. The Natural Heritage and Natural Areas Programs are in the process of developing a communications strategy that will address ways to strengthen the relationships with our diverse audiences, promote awareness of Natural Areas, promote understanding of ecology, and ultimately, foster an enduring commitment to biodiversity conservation.

An important aspect of this strategy is identifying opportunities to collaborate with communities beyond those traditionally engaged in conservation activities. By including practitioners in the social sciences, arts, and humanities, it may be possible to generate innovative pathways by which people can connect with Natural Areas, tackle the most complex challenges in conservation, and create sustainable communities.



Woodard Bay NAP



Morning Star NRCA

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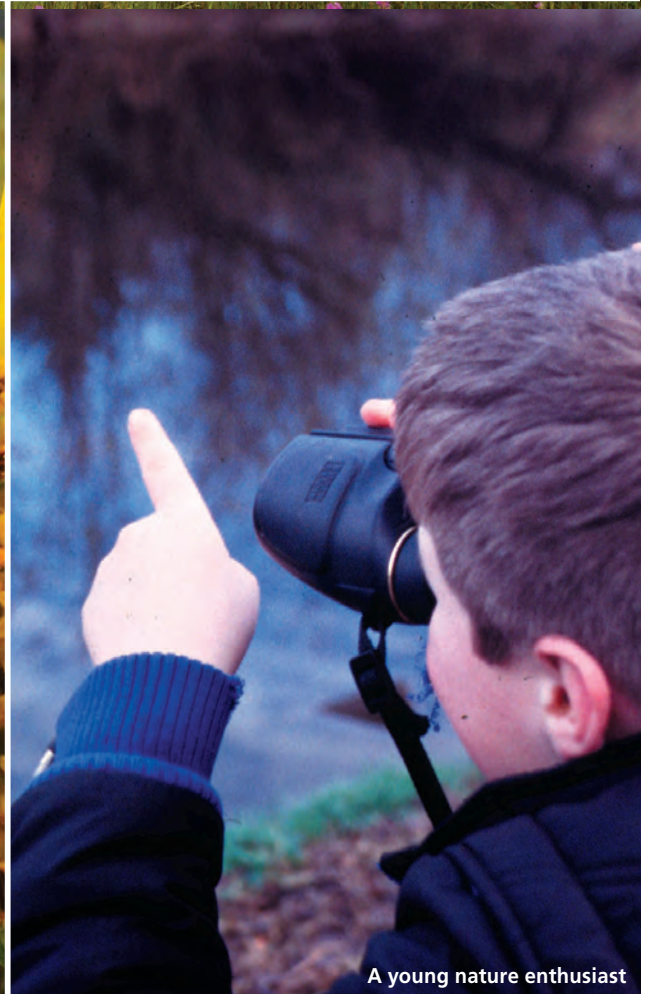
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A vernal pool in eastern Washington



Taylor's checkerspot butterfly on deltoid balsamroot



A young nature enthusiast

Glossary

Note: terms are defined as used in this *Plan*; alternate definitions may exist.

Biodiversity: The variety and variability of life found in a place.

Demographic: The structure of populations.

Disjunct: A population that is widely separated from other populations of the same species.

Distribution: The manner in which a biological taxon is spatially arranged.

Endemic: Occurring nowhere else.

Extirpated: A species that has been destroyed or removed from its natural territory in Washington.

Natural heritage: all of the native species, plant communities, aquatic types, and geologic features of Washington; all natural features of the state; the state's natural diversity.

Nonvascular species: Species without a vascular system; includes mosses, lichens, liverworts, and hornworts.

Peripheral: On the edge of the species' distribution.

Sighting record: Documentation of the observation of a species.

Taxonomy: The process of naming and classifying organisms.

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