Washington’s Natural Areas
A Statewide Network for Ecological Research

All areas within the state, except those which are expressly dedicated by law for preservation and protection in their natural condition, are subject to alteration by human activity. Natural lands, together with the plants and animals living thereon in natural ecological systems, are valuable for the purposes of scientific research, teaching, as habitats of rare and vanishing species, as places of natural historic and natural interest and scenic beauty, and as living museums of the original heritage of the state.

— Revised Code of Washington, Title 79.70

Conserving Washington’s Natural Areas
Washington is home to a tremendous diversity of ecosystems and rare species. Natural areas designated by the Washington State Department of Natural Resources (DNR) protect much of this abundant biodiversity while also providing opportunities for researchers, educators and students to learn about Washington's species and ecological processes. Natural areas host research studies and serve as living laboratories for scientific and environmental education. By studying these areas we improve our understanding of the natural world and what it takes to keep Washington's biodiversity healthy into the future.

A History of Research
Since the Natural Area Preserve Act established the program in 1972, more than 400 research projects and other studies have taken place on natural areas managed by DNR, including natural area preserves (NAPs) and natural resources conservation areas (NRCAs). The topics covered have been highly varied, including studies related to air and water quality, soil ecology, genetics, ecosystem monitoring, geologic events, rare species recovery, fossil distribution, climate change, and cultural histories. The majority of projects have focused on rare species monitoring and recovery, habitat restoration, and invasive species control methods. Natural areas provide a valuable ecological template of native ecosystems for use by other land managers.

Natural areas continue to be actively used for research and monitoring today. Here are a few highlights of recent projects:

- A research team from the Washington Department of Fish and Wildlife is working on establishing protocols for testing environmental DNA (eDNA) markers to detect the presence of Oregon Spotted Frogs at various locations, including Trout Lake NAP. This is done by taking a sample of surface water, and filtering it to find the unique genetic material contained within. The Oregon Spotted Frog (*Rana pretiosa*) is listed as a threatened species under the Endangered Species Act, and this research will aid in conservation of the species.
The United States Geological Survey led a recent study to assess key factors influencing potential climate change responses of pika populations (*Ochotona princeps*). Among other components, this project examined the distribution and connectivity of pika within the Columbia River Gorge, as well as microclimatic variables at occupied and unoccupied sites including Columbia Falls NAP and Table Mountain NRCA.
(http://www.usgs.gov/newsroom/article.asp?ID=3526)

Scientists from Simon Fraser University in Canada are studying pollinator communities in Garry oak ecosystems in the Pacific Northwest, including several Washington natural areas. This project is focused on plant-pollinator interactions, and the structure and resilience of pollinator communities in response to disturbances. Understanding these interactions and responses could provide important insights for conserving and managing fragmented habitats.
(https://www.sfu.ca/people/eelle.html)

As part of a project investigating evidence of past earthquakes and tsunamis within salt marsh stratigraphy on the Washington Coast, researchers collected sediment cores from several locations, including the Niawiakum River NAP. This collaborative project between the University of Rhode Island, University of North Carolina, Rutgers University, and the United States Geological Survey is designed to improve our understanding of past seismic events and earthquake cycles, which can help coastal communities better prepare for future natural hazards.
(https://nsf.gov/awardsearch/showAward?AWD_ID=1419824&HistoricalAwards=false)

**Who is involved?**

Colleges and universities from throughout the U.S. and Canada, as well as high schools, government agencies, non-profit organizations, and individuals have conducted studies on Washington’s natural areas. The DNR Natural Areas Program typically receives 10-15 applications to conduct formal research projects each year, in addition to many requests for field trips and educational outings. Natural Areas Program ecologists coordinate with researchers to help determine which natural areas will best suit their objectives, to ensure that their projects will not conflict with existing studies or with site conservation activities, and to provide data that may be of assistance.

The list of research participants includes universities and colleges both near and far, such as Washington State University, University of California-Berkeley, Duke University, University of Kansas, and, in Canada, the University of Alberta and the University of Guelph. A variety of local, regional, and international non-profit organizations are also represented, such as the Dishman Hills Conservancy (Spokane, WA), the San Juan County Land Bank (San Juan Islands, WA), the Institute for Applied Ecology (Corvallis, OR), the Natural History Museum of Los Angeles, The Nature Conservancy and the Canadian Museum of Nature.

A large number of projects were conducted at Pinecroft NAP in the 2000s by the North Central High School’s science department in Spokane as part of a research program designed to teach real-life skills to aspiring scientists. These projects not only benefited the students involved, they also generated valuable data on a wide-range of topics.
A Statewide Network of Natural Areas
The system of natural areas managed by Washington State DNR includes 93 preserves and conservation areas throughout the state. This conservation system provides excellent representation of the state’s biophysical environments and biodiversity, making natural areas prime candidates for ecological research. As of 2017, experimental and investigative research projects have been conducted on natural areas throughout the state, including 54 natural areas in 20 counties. Other types of inventory or monitoring projects have been carried out at an additional 22 sites statewide.

Exceptional Places
Quality examples of Washington’s native grasslands, woodlands, marshes and more are protected in natural areas managed by the Department of Natural Resources (DNR). These special sites offer opportunities for research and education. Some have interpretive or recreation trails. Others require DNR permission to visit because features are sensitive to human disturbance.

For more information contact the DNR
Natural Areas Program
PO Box 47014
Olympia, WA 98504-7014
(360) 902-1600
TRS: 7-1-1
dnr.wa.gov
Getting Involved

Because DNR’s natural areas are some of the highest functioning, most intact native ecosystems remaining, we can monitor them to better understand the challenges facing conservation ecology and natural resource management today, including climate change and the impacts of invasive species. These issues will require expanding and refining ecological theory and improving our understanding of ecosystem processes and functions. As new ecological questions emerge in the future, there will continue to be a need for establishing sites dedicated to hosting research addressing the wide array of topics related to species and ecosystems.

Washington’s natural areas provide excellent research opportunities, today and into the future. Among current topics of research interest are:

- **Influences of climate change**
  - Natural area planning and design
  - Restoration targets
- **Invasive Species Ecology**
  - Invasiveness and invasibility
  - Alternative control methods
- **Rare Species Ecology and Restoration**
  - Butterfly habitat restoration
  - Pollination ecology
  - Introductions and re-introductions
- **Ecosystem and Community Ecology**
  - Disturbance dynamics
  - Community assembly
- **Restoration Ecology**
  - Minimum patch size and connectivity thresholds
  - Soil ecology

Interested in learning more or conducting research on natural areas?

Contact: Natural Areas Program Ecologist
(360) 902-1556; david.wilderman@dnr.wa.gov

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