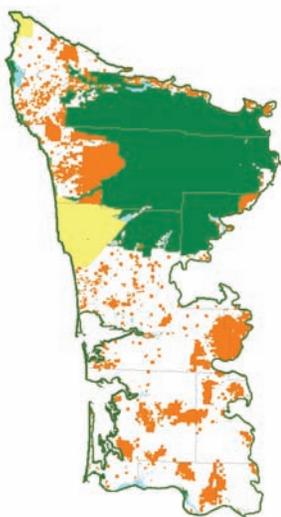


Northwest Coast Ecoregion

The Northwest Coast ecoregion includes most of the Olympic Peninsula of Washington, the coast mountain ranges extending down to central Oregon, and most of Vancouver Island in British Columbia. Approximately 11 percent of Washington is within this ecoregion.

As of 1991, about 5 percent of the Washington portion had been converted to agricultural or urban uses (Washington GAP, 1997).



NORTHWEST COAST LAND OWNERSHIP

- Federal
- State
- Tribal
- Private



CLIMATE

- ▶ Precipitation ranges from 60 to 240 inches annually, mostly falling as rain from November through April.
- ▶ Snow pack and rain-on-snow zones occur primarily in the Olympic Mountains.
- ▶ Due to a rain shadow effect, the northeastern Olympic Mountains receive the lowest precipitation of equivalent elevations anywhere in western Washington.
- ▶ Summer fog and cool temperatures are important climatic factors along the outer coast and adjacent valleys.

PHYSIOGRAPHY

- ▶ Olympic Mountains, ocean coast, coastal plain, and Willapa Hills are dominant landforms
- ▶ Glaciated peaks of the Olympic Mountains rise to nearly 8,000 feet above sea level.
- ▶ Streams and rivers typically begin as deeply incised, steep gradient drainages, eventually feeding large, low-gradient river systems on the coastal plain.
- ▶ Coastal plain is mostly underlain by glacial till and outwash.
- ▶ Major estuaries and associated dunes occur on the southern coast.
- ▶ Willapa Hills are well-rounded highlands with old, well-weathered soils.

BIOTA

- ▶ Coniferous forests dominate the vegetation of the ecoregion, with lowland forests of western hemlock, Douglas-fir, and western redcedar.
- ▶ Sitka spruce is abundant in the coastal fog belt.
- ▶ Mountain forests are dominated by Pacific silver fir and mountain or western hemlock.
- ▶ Subalpine parkland and alpine habitats occur at high elevations.
- ▶ The ecoregion includes two of the largest estuaries on North America's west coast.
- ▶ Other special habitats include coastal dunes, wetlands, riparian areas, and sphagnum bogs.
- ▶ The Olympic Mountains are rich in rare plant species due to their isolation, the number of unusual habitats, and the presence of steep environmental gradients.

BIODIVERSITY HIGHLIGHTS

- ▶ Dominated by natural and semi-natural vegetation
- ▶ Large, healthy estuaries
- ▶ Salmon-bearing rivers
- ▶ High amphibian diversity
- ▶ High vascular plant endemism in the Olympic Mountains

MAJOR LANDOWNERS

- ▶ National Park Service
- ▶ U.S. Forest Service
- ▶ Tribes
- ▶ DNR
- ▶ Private timber companies

DOMINANT LAND USES

- ▶ Forestry
- ▶ Outdoor recreation / conservation

PRINCIPAL RISKS TO BIODIVERSITY

- ▶ Landscape-level changes in forest composition and structure
- ▶ Increasing development in coastal areas and valley bottoms
- ▶ Invasive species
- ▶ Impacts of climate change to coastal ecosystems
- ▶ Increased isolation from the Cascades for species and ecosystems

CONSERVATION NEEDS

- ▶ Protection of forested wetlands
- ▶ Control of invasive species (spartina, knotweed, tunicates, and others)
- ▶ Protection of natural-origin forests in Willapa Hills and on Olympic Peninsula coastal plain
- ▶ Coordination of natural areas system and marine protected areas system



Andrews Creek salt marsh.



Natural Heritage, Natural Areas, and Special Lands Acquisition priority projects and activities for the 2007-2009 biennium are identified below, along with conservation actions undertaken during the 2005-2007 biennium. These are not exhaustive lists; they are meant to provide the reader with an overview of the type and scope of projects being undertaken. A few projects have been highlighted, while others have simply been listed.

05 THROUGH 07 Conservation Actions

Henderson's checkermallow status report

The Natural Heritage Program botanist prepared a report on the status of *Sidalcea hendersonii* (Henderson's checkermallow) in Washington. The final recommendation to the U.S. Fish & Wildlife Service was that listing under the federal Endangered Species Act was not currently warranted.

Chehalis River Basin weed control

Weed control was conducted by Natural Areas Program staff in the Chehalis River basin, including within the Chehalis River Surge Plain NAP.

Olympic National Park vegetation classification

Natural Heritage staff have been entering vegetation plot data from a number of sources and applying statistical analyses in an effort to identify and characterize the many ecosystem types that occur within the park.

Other Activities

- ▶ Extensive road abandonment and hydrologic improvements at Elk River NRCA, North Bay NAP, Clearwater Bogs NAP and South Nemah NRCA (including funding from the U.S. Fish & Wildlife Service)
- ▶ Control of *Spartina* in the Bone River and Niawiakum River NAPs (using funding from Department of Ecology and the National Fish & Wildlife Foundation)
- ▶ Re-initiation of wave energy mitigation studies for Whitcomb Flats NAP, working with the U.S. Army Corps of Engineers

07 THROUGH 09 Priority Projects/Activities

Olympic National Park vegetation classification and mapping

A vegetation classification for three national parks, including Olympic NP, will be completed by NHP plant ecologists. The classification will be used by the National Park Service as a basis for mapping the vegetation, which will in turn be used as a tool by land management decision-makers.

Natural areas road abandonment and restoration

Implementation of a road abandonment project will be continued at Ellsworth Creek NRCA, Elk River NRCA, Hendrickson Canyon NRCA, Merrill Lake NRCA, South Nemah NRCA, and Willapa Divide NAP.

Other Projects

- ▶ Continue efforts to complete acquisitions within the approved boundary for Elk River NRCA
- ▶ Identify additional natural areas needs within the ecoregion
- ▶ Weed control within Chehalis River Surge Plain NAP
- ▶ Hydrology restoration at North Bay NAP



DNR PHOTO



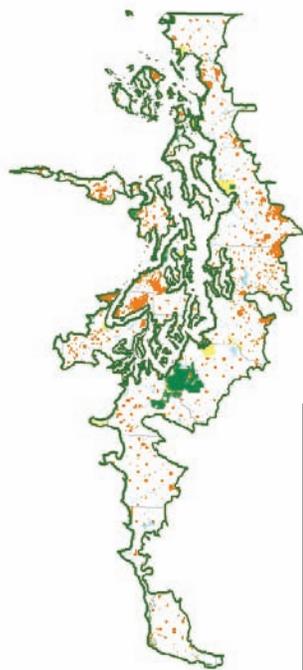
CHRIS WASH

Top: Henderson's checkermallow occurs in estuaries, including several natural areas.

Below: Chehalis River Surge Plain NAP.

Puget Trough Ecoregion

The Puget Trough ecoregion is nestled between the Cascade and Olympic Mountains and the Willapa Hills. It includes Puget Sound and the lowlands south to the Columbia River. The ecoregion extends north into the Georgia Basin in British Columbia and south into the Willamette Valley in Oregon. Roughly 8 percent of Washington is within this ecoregion. It is by far the most populated ecoregion in Washington; as of 1991, more than 50 percent of the Washington portion had been converted to urban and agricultural uses (Washington GAP, 1997).



PUGET TROUGH LAND OWNERSHIP

- Federal
- State
- Tribal
- Private



PHYSIOGRAPHY

- ▶ Includes marine waters of Puget Sound and lowlands generally up to 1,000 feet above sea level; isolated highlands extend up to 2,400 feet.
- ▶ Retreating Pleistocene glaciers left behind glacial till plains over much of the area north of Olympia, and outwash plains between Tacoma and Centralia. Pleistocene floods formed the smooth floor of the Portland Basin around Vancouver.
- ▶ Ancient, well-weathered soils predominate between Centralia and Clark County.
- ▶ In the north, the mainland hills and San Juan Islands are composed of rocks common in the adjacent mountainous ecoregions.
- ▶ Large, low-gradient rivers begin in the adjacent mountains and flow through this ecoregion.
- ▶ Smaller streams originate at low elevations.
- ▶ Freshwater lakes are numerous in the glaciated portions of the ecoregion.

CLIMATE

- ▶ The Olympic Mountains and Willapa Hills create rain shadows that influence this ecoregion.
- ▶ Precipitation, primarily rain, ranges from 20 to 70 inches annually over the ecoregion.
- ▶ Summers are warm and dry compared to elsewhere within western Washington, and winters are mild.

BIOTA

- ▶ Dominated by Douglas-fir forests with western hemlock and redcedar as the primary late-successional species.
- ▶ Oregon white oak, Pacific madrone, bigleaf maple, and red alder forests are plentiful.
- ▶ Grassland habitats, often associated with open oak woodlands, were historically maintained with frequent fires; they support rare species such as the federally threatened golden paintbrush and a number of butterfly species.
- ▶ Rare grassland species are declining due to development and lack of historic fire regimes.
- ▶ Other special habitats include wetlands, riparian areas, bogs and estuaries.

BIODIVERSITY HIGHLIGHTS

- ▶ Marine waters, tidelands, and estuaries
- ▶ Grasslands and oak woodlands
- ▶ Salmon

MAJOR LANDOWNERS

- ▶ Department of Defense
- ▶ National Park Service
- ▶ DNR
- ▶ Tribes
- ▶ State Parks
- ▶ WDFW

DOMINANT LAND USES

- ▶ Industrial / commercial / residential
- ▶ Military bases
- ▶ Forestry
- ▶ Outdoor recreation / conservation
- ▶ Agriculture

PRINCIPAL RISKS TO BIODIVERSITY

- ▶ Continued rapid development, both in terrestrial habitats and along shorelines
- ▶ Increased isolation of remnant natural areas
- ▶ Invasive, non-native species
- ▶ Climate change and resultant impacts to coastal ecosystems
- ▶ Increased contaminants in Puget Sound

CONSERVATION NEEDS

- ▶ Protection and restoration of grasslands and oak woodlands and their associated rare species
- ▶ Maintenance of existing large blocks of managed forest lands
- ▶ Conservation and restoration of estuarine marshes and tidal flats
- ▶ Restoration of riparian systems
- ▶ Protection of existing high-quality freshwater wetlands and bogs
- ▶ Creating functioning landscapes to support remnant ecosystems

DNR staff and partners visit the proposed Lacamas Prairie natural area.





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05 THROUGH 07 Conservation Actions

Natural areas acquired

Lands were acquired within existing, approved natural areas, improving the protection for grasslands, oak woodlands, forested and wetland ecosystems, and other priority ecosystems and species. Lands were acquired at Woodard Bay NRCA, Washougal Oaks NAP/NRCA, Mima Mounds NAP, Cypress Island NRCA, Shumocher Creek NAP, and Stavis NRCA.

Partnered with Whidbey Camano Land Trust to establish Admiralty Inlet NAP

Protection of this site boosts the chances for successful recovery of the golden paintbrush, a federally threatened plant species.

Environmental education access provided at Kennedy Creek NAP

An interpretive observation area was constructed.

Other Activities

- ▶ Lacamas Prairie approved by the Natural Heritage Advisory Council as a new natural area
- ▶ Potential golden paintbrush reintroduction sites in Island and San Juan counties were evaluated (with USFWS, National Park Service, and TNC)
- ▶ Surveys were conducted for Island Marble butterfly (with USFWS, NPS, and WDFW)
- ▶ Removal of Scot's broom and other invasive species was carried out at Mima Mounds NAP and Rocky Prairie NAP.
- ▶ Natural Areas scientists participated in planning and proposal development for South Sound prairie and grassland habitat enhancement through the Ft. Lewis Army Compatible Use Buffer program.

07 THROUGH 09 Priority Projects/Activities

Acquisitions within several approved natural areas

Acquisition priorities (dependent upon availability of funds and willing sellers) include three recently approved natural areas (Lacamas Prairie NAP/NRCA, Washougal Oaks NAP/NRCA, and Stavis NRCA) as well as enlarging several well-established natural areas (Mima Mounds NAP, Kennedy Creek NAP, Woodard Bay NRCA, Cypress Island NRCA, and Bald Hills NAP/NRCA).

Golden Paintbrush Recovery

Natural Heritage and Natural Areas will work to gain a better understanding of the species' habitat requirements to help guide habitat enhancement at Admiralty Inlet and Rocky Prairie NAPs. Prescribed burning and mowing treatments are planned for Rocky Prairie. Potential sites for reintroduction will also be identified. Partners in these efforts include USFWS, National Park Service, The Nature Conservancy, the Whidbey Camano Land Trust and others.

Other Projects

- ▶ Conservation planning in southwest Washington, including recovery planning for Nelson's checkermallow, Kincaid's lupine, and Bradshaw's lomatium
- ▶ Complete management plans for Mima Mounds and Bald Hill NAPs
- ▶ Continue Island Marble butterfly cooperative project with USFWS and WDFW
- ▶ Implement intensive efforts to control tall oatgrass at Mima Mounds and Rocky Prairie NAPs
- ▶ Enhance grassland bald habitat for Taylor's checkerspot at Bald Hill NAP
- ▶ Assess slender-billed white-breasted nuthatch use of Washougal Oaks NAP



JAMES MISKELLY

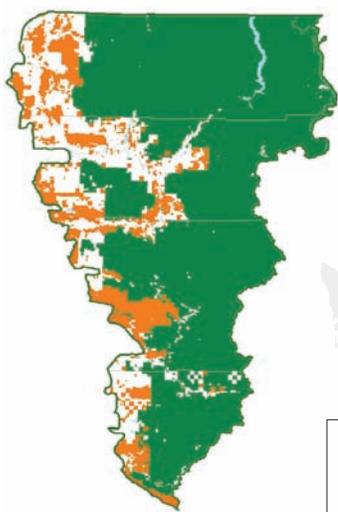


DNR PHOTO

Top: Conservation of the Island Marble butterfly is a priority for NHP and several partners.
Below: Washougal Oaks NAP/NRCA.

North Cascades Ecoregion

The North Cascades ecoregion includes the Cascade Mountains north of Snoqualmie Pass and west of the crest extending northward into British Columbia. Approximately 10 percent of Washington occurs within this ecoregion. As of 1991, less than 2 percent of Washington's portion had been converted to urban and agricultural development (Washington GAP, 1997).



NORTH CASCADES LAND OWNERSHIP

- Federal
- State
- Tribal
- Private



CLIMATE

- ▶ Precipitation ranges from 60 to 160 inches annually across the ecoregion, most accumulating as snow and rain from October through April.
- ▶ The mountains are covered with snow for many months and middle elevations have significant snowpacks that fluctuate over the course of the winter with rain-on-snow events, while lower elevations accumulate little snow.

PHYSIOGRAPHY

- ▶ Highly dissected, glaciated mountain terrain, mostly between 1,000 and 7,000 feet above sea level.
- ▶ Highest peaks are volcanoes that rise to more than 10,000 feet, with valley bottoms as low as 500 feet.
- ▶ Glacially carved U-shaped valleys and cirques are prominent.
- ▶ Steep-gradient small stream drainages feed major rivers leading into the adjacent Puget Trough ecoregion.
- ▶ Natural lakes, most created by glacial processes, are plentiful.

BIOTA

- ▶ Vegetation consists mostly of western hemlock – Douglas-fir – western redcedar forests at low elevations, Pacific silver fir – western hemlock forests at middle elevations, and a mosaic of mountain hemlock – silver fir forests and subalpine parkland at high elevations.
- ▶ Natural stand replacement fires occur at irregular intervals of 90 to 250 years.
- ▶ Above timberline, alpine heaths, meadows and fellfields are interspersed with barren rock, ice, and snow.
- ▶ Special habitats include riparian areas dominated by broadleaf trees, avalanche chutes dominated by Sitka alder or vine maple, and wetlands.
- ▶ A number of plant species are considered rare in Washington but are more common to the north.
- ▶ One of the few ecoregions in Washington with a variety of large carnivores, including gray wolf, grizzly bear, and wolverine.
- ▶ Salmon are found in most of the large rivers.

BIODIVERSITY HIGHLIGHTS

- ▶ Southern edge of the range for many species more common in British Columbia and Alaska
- ▶ Important habitats for wide-ranging carnivores
- ▶ Relatively intact, dominated by semi-natural and natural vegetation

MAJOR LANDOWNERS

- ▶ National Park Service
- ▶ U.S. Forest Service
- ▶ DNR
- ▶ Private timber companies

DOMINANT LAND USES

- ▶ Forestry
- ▶ Outdoor recreation / conservation

PRINCIPAL RISKS TO BIODIVERSITY

- ▶ Landscape-level changes in forest composition and structure
- ▶ Development and conversion of forest to non-forest uses, primarily in valley bottoms
- ▶ Increasing outdoor recreational activity

CONSERVATION NEEDS

- ▶ Protection and restoration of riparian floodplains
- ▶ Restoration of salmon habitat / populations
- ▶ Recovery of large carnivores



Upper Sultan Basin NRCA





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05 THROUGH 07
Conservation Actions

Upper Sultan Basin landscape protection

Through Trust Land Transfer of more than 4,000 acres of state lands, the three NRCAs of Greider Ridge, Morning Star, and Mount Pilchuck are now connected, forming the largest conservation and low-impact recreation landscape — some 30,100 acres — managed by the Natural Areas Program

North Cascades Ecoregional Assessment

Natural Heritage Program staff participated in the development of an ecoregional assessment for the North Cascades.

Whatcom Legacy Project

Natural Heritage Program staff provided information and expertise to assist the Whatcom Legacy Project's initial efforts to develop a 100-year plan for conservation within the county.

07 THROUGH 09
Priority Projects/Activities

North Cascades National Park vegetation classification and mapping

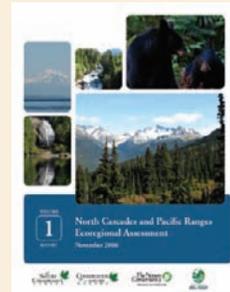
A vegetation classification for three national parks, including North Cascades NP, will be completed by NHP plant ecologists. The classification system will be used by the National Park Service as a basis for mapping the vegetation, which will in turn be used to help inform management decisions. The National Park Service is funding this project.

Other Activities

- ▶ Continue efforts to complete acquisition of lands within Mt. Si NRCA
- ▶ Identify additional natural area needs within the ecoregion



DNR PHOTOS



Top: Upper Sultan Basin NRCA.
Below: NHP scientists participated in the development of the North Cascades ecoregional assessment.