



Chehalis River Surge Plain NAP Management Plan

*Grays Harbor County, Washington
January 2009*



WASHINGTON STATE DEPARTMENT OF
Natural Resources
Peter Goldmark - Commissioner of Public Lands

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Chehalis River Surge Plain/Birdie Davenport

Chehalis River Surge Plain Natural Area Preserve Management Plan

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Grays Harbor County
Washington
January 2009

Prepared by
Pacific Cascade Region
Natural Areas Program
Washington State Department of
Natural Resources



Scouler's corydalis; *corydalis scouleri*

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PREFACE

The Natural Area Preserves Act was enacted in 1972 by the Legislature 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” (RCW 79.70). The Washington Department of Natural Resources (DNR) Natural Areas Program manages Natural Area Preserves in accordance with the Natural Area Preserves Act RCW 79.70.

Implementation of Washington’s statewide system of natural areas is a cooperative effort. Various public agencies, private groups and individuals work together to establish and manage areas. Once established, Natural Areas are managed to protect the ecological features for which the site was designated, to restore native ecosystems, and for scientific and educational use.

This plan provides guidance for management of DNR-owned lands within the Natural Area Preserve boundary. Private lands within the boundary are not affected or regulated by this plan.



Sitka spruce wetland community at Blue Slough

EXECUTIVE SUMMARY

Chehalis River Surge Plain (CRSP) Natural Area Preserve (NAP) is located on the Chehalis River between Montesano and Cosmopolis in Grays Harbor County, Washington. The site is part of the statewide system of natural areas established and maintained by the Department of Natural Resources (DNR). DNR designated the NAP in 1989 to protect the largest and highest quality coastal surge plain wetland in the state of Washington. It also protects two animal species federally listed as sensitive in Washington: the bald eagle and the Olympic mudminnow.

Of the approximate 7,000 acres eligible for inclusion into the NAP, DNR manages approximately 2,345 acres as NAP. The remaining acreage is under private ownership, and therefore is not managed under the provisions of this plan.

In 2007, DNR initiated the management planning process for the lands it manages within the NAP. The purpose of the plan is to define strategies to protect the primary ecological features of the site, and identify opportunities for outdoor education and low impact public use. The planning process included public and stakeholder involvement to review draft plans and discuss management options. Representatives from local and regional organizations, Washington Department of Fish and Wildlife, Grays Harbor County, business, timber companies, neighbors and other interested citizens participated in these discussions and reviews.

The plan outlines management goals for the preserve and lists strategies and actions to support the goals. These goals include:

- Protect the site's primary natural features.
- Provide for public access compatible with management of the preserve.
- Monitor threats to the natural features and the health of natural systems.
- Facilitate environmental education and research on the site.
- Manage non-native and invasive plant species.
- Protect cultural and archeological sites.

DNR Pacific Cascade Region will implement this plan with assistance from the Natural Areas ecologists and in coordination with Tribes, other DNR land managers, state, federal and local government agencies, citizens, volunteers and planning group participants. Implementation of the plan depends on the availability of resources to complete the identified actions.

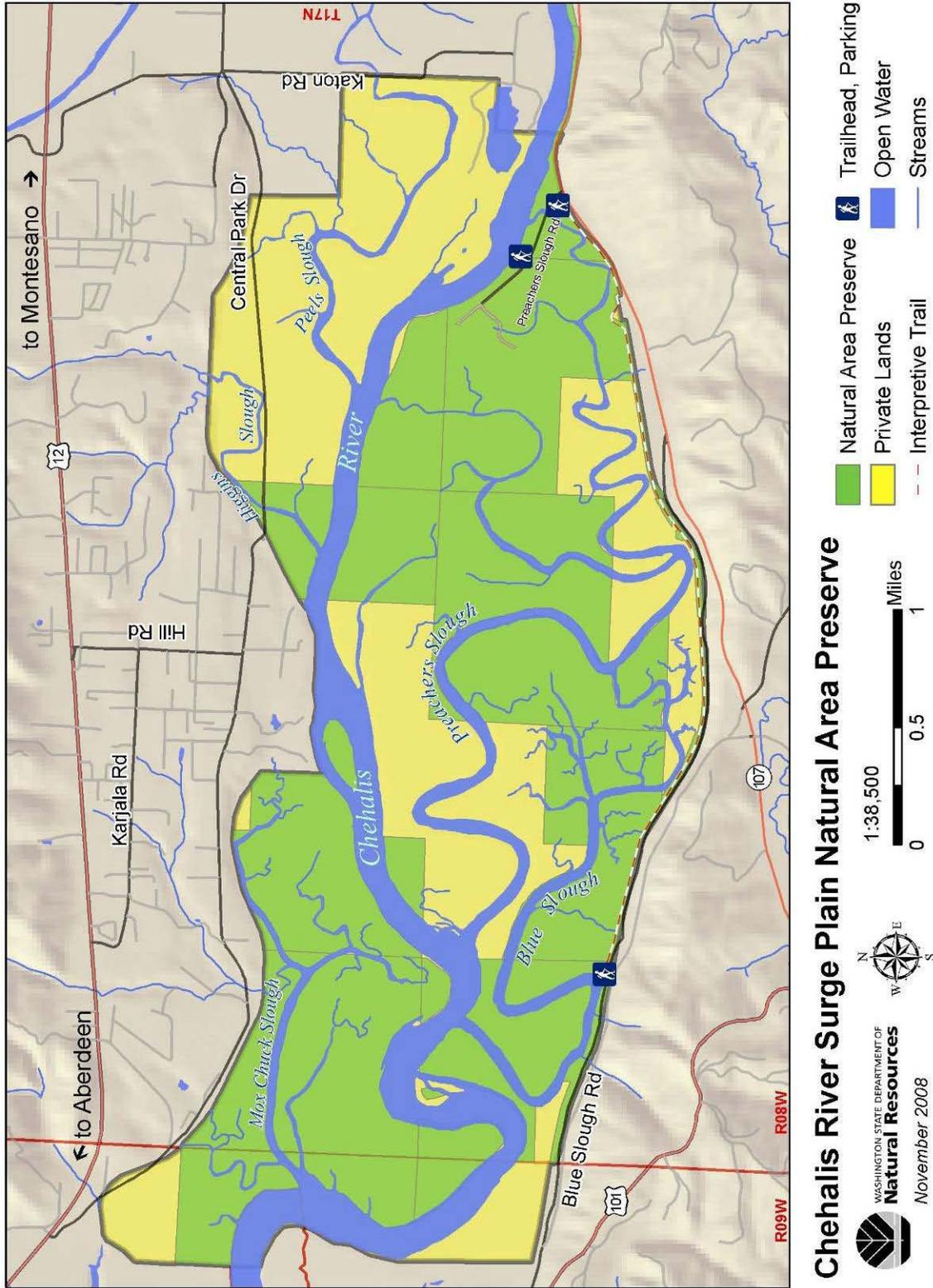


Figure 1. Chehalis River Surge Plain NAP Vicinity Map

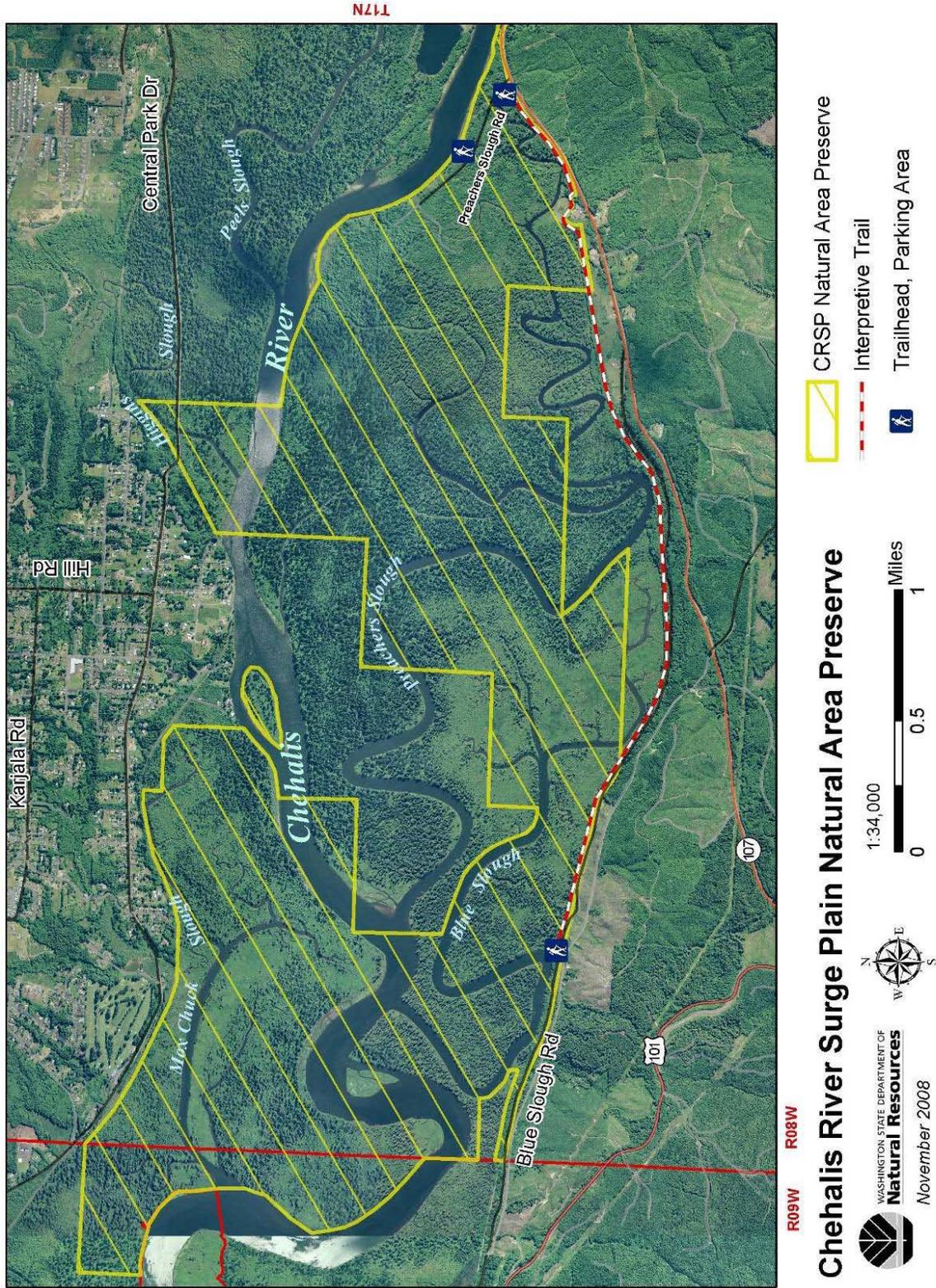


Figure 2. Chehalis River Surge Plain NAP Aerial View

I. INTRODUCTION

A. Washington's Natural Areas System

The Chehalis River Surge Plain (CRSP) Natural Area Preserve (NAP) is part of the statewide system of preserves established to secure representation of all of the state's ecosystems and rare species.

An NAP may contain the only example of a particular natural feature within the state or it may contain a high quality representative example of a more widely distributed feature. DNR is among the various state agencies, including the Washington State Parks and Recreation Commission and the Washington Department of Fish and Wildlife (WDFW), as well as private organizations, that manage these outstanding examples of Washington's natural features.

NAPs are important for research and education on ecological and environmental topics. Because they retain much of their natural character, NAPs also serve as examples of natural conditions for comparison with similar ecosystems that are managed for other values (e.g., resource production or utilization, and recreation).

Natural Heritage Program

The Washington State Legislature recognized the need for a systematic and objective approach to guide inventory and protection efforts in order to protect features most at risk. As a result, the Natural Heritage Program was established.

The Natural Heritage Program provides a scientific approach to the process of identifying candidate sites for the natural areas system. A biennial State of Washington Natural Heritage Plan that identifies priorities for inclusion in the system provides the framework for a statewide system of natural areas.

The program tracks the state's natural features, species, and ecological systems through a classification system inventoried by location. This data is shared with agencies, organizations, and individuals for environmental assessment, conservation planning, and land management purposes.

The Natural Heritage Plan (WDNR 2007) identifies the primary features of the Chehalis River Surge Plain NAP as deserving of protection and representation in the State's preserve system.

Natural Heritage Advisory Council

The Natural Heritage Advisory 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, recommends sites to the Commissioner of Public Lands, and works with the Natural Heritage Program, Natural Areas Program staff and the appropriate DNR

regional office or other state agency staff to develop management plans for established natural areas.

The Council ensures implementation of sound management practices for the preservation and maintenance of high quality sites. The Council has 15 members including:

- Five non-voting ex-officio state agency representatives.
- Ten voting members serving 4-year-terms appointed by the Commissioner of Public Lands.

Of the ten voting members:

- Five must be recognized experts in the ecology of natural areas.
- One must be or represent a private forest landowner.
- One must be or represent a private agricultural landowner.
- Three are at-large positions.

Natural Areas Program

The Natural Areas Program manages DNR-owned NAPs and Natural Resources Conservation Areas (NRCAs). As of 2008, the natural areas system included 52 NAPs, totaling 32,500 acres, and 29 NRCAs totaling 93,612 acres. NRCAs protect significant areas that meet broader conservation objectives and may include a variety of low impact uses. Examples include Mount Si, Woodard Bay, and Cypress Island.

The objective of management activities is to protect the primary natural features of each NAP and provide opportunities for research and environmental education as appropriate to each site. DNR region staff is responsible for management planning and implementation. Program staff in Olympia provide guidance, scientific expertise and project support, ensure consistency of management statewide, and participate in preserve management activities, species and community monitoring and research.

NAP Management

Active management is necessary in many natural areas to ensure the long-term viability of the priority species and ecosystems found within them.

Management issues and activities include restoring or mimicking natural ecological processes control of non-native species and addressing public use issues. NAPs are generally in good ecological condition at the time of designation. However, they are not always pristine; in many cases undisturbed examples of ecosystems no longer exist, or they may not be available for formal protection. Thus management recommendations vary depending on site condition, size and landscape context, and range from minimal site protection activities to more active site management designed to achieve specific results.

While NAPs require a conservative approach to managing public access and uses, other public lands of the state allow for a wider range of public and recreational uses.

The Department of Natural Resources

DNR manages more than 5.6 million acres of state-owned forest, range, commercial, agricultural, aquatic, and conservation lands. The department also provides wildfire protection for 12.7 million acres of private and state-owned forestlands; administers Forest Practices rules and surface mine reclamation on state and private lands; gives technical assistance for forestry and mining; and provides financial and grant assistance to local communities and individuals.

B. Chehalis River Surge Plain Natural Area Preserve's Primary Natural Features

The Natural Heritage Program recommended the establishment of the CRSP NAP to protect the largest and highest quality Sitka spruce-dominated, coastal surge plain wetland in Washington State.

The term "surge plain" describes the natural condition created when the tide rises and the incoming heavier salt water forms a wedge under the fresh river water, forcing fresh water to surge out over low-lying areas.

The CRSP NAP is also an important site for protection of two animal species listed as Species of Concern in Washington: the bald eagle and the Olympic mudminnow.

The following species and vegetation types are considered the "primary features" of the site:

1. Freshwater tidal surge plain wetland, including the following vegetation types within the North Pacific Intertidal Freshwater Wetland Ecological System (NatureServe 2003; WNHP 2008):
 - a. Sitka spruce (*Picea sitchensis*)/red-osier dogwood (*Cornus sericeus*)/ skunk cabbage (*Lysichiton americanum*) forest vegetation.
 - b. Lady fern (*Athyrium filix-femina*) coastal herbaceous vegetation.
 - c. Softstem bulrush (*Schoenoplectus tabernaemontani*) herbaceous vegetation.
 - d. Red-osier dogwood (*Cornus sericeus*)–Willow species (*Salix* sp.) shrubland.
 - e. Lyngby's sedge (*Carex lyngbyei*) herbaceous vegetation.
 - f. Cattail (*Typha latifolia*) surge plain herbaceous vegetation.
2. Bald eagle nesting area (*Haliaeetus leucocephalus*).
3. Olympic mudminnow (*Novumbra hubbsi*).

Freshwater Tidal Surge Plain Wetland

The freshwater tidal surge plain wetland occupies virtually the entire site except for the highest upland areas. This wetland includes tidal sloughs, areas that are intermittently flooded during high tides and areas that are routinely flooded to varying depths.

The vegetation types within the wetland are associated with these different flooding regimes, as well as areas of different soil characteristics. There are only four other known wetlands of this type in Washington, all of which are substantially smaller and in poorer ecological condition than the Chehalis River Surge Plain wetland. The large size and good condition of the wetlands on this site were the basis for establishing the preserve in 1989.

Bald Eagle Nesting Area

Bald eagles have been observed nesting in various areas on the site during the past 20 years. Although the bald eagle has recovered nationwide and is no longer a federally listed endangered species, it still remains on the WDFW State Sensitive species list as of 2008. Most of the site provides high-quality nesting and foraging habitat for bald eagles.

Olympic Mudminnow Habitat

There have been observations of the Olympic mudminnow within a portion of the area. Since much of the site provides suitable habitat, the species probably exists throughout the surge plain. This species is endemic to Washington State, and lives in the southern and western lowlands of the Olympic Peninsula, the Chehalis and lower Deschutes River drainages, and Southern Puget Sound.

Ranking of Primary Natural Features

Each of these features received a priority (P) ranking of P2 or P3 in the 2007 Natural Heritage Plan. The ranking reflects the statewide rarity of the species or ecosystem, the degree of threat present statewide, and, for ecosystems, the degree to which it is already represented within the Natural Areas System.

The freshwater tidal surge plain wetland currently is a Priority 2 in the 2007 Natural Heritage Plan. The Olympic mudminnow is a Priority 3. When the site was recommended in 1989, the bald eagle was classified as Priority 2. Due to advances in its protection and increases in population size, the Natural Heritage Program no longer tracks the bald eagle but still recognizes its State Sensitive species status.

The primary tool used to develop priorities for individual species, and for some ecosystem types, is the global and state ranking system used by NatureServe and its member Natural Heritage programs. The ranking system facilitates a quick assessment of rarity by assigning a global (G) and state (S) rank of 1 to 5. A collaborative process involving both NatureServe and individual Natural Heritage Program scientists assign the global ranks. Scientists within individual Natural Heritage programs assign state ranks.

G1, for example, indicates critical imperilment on a global basis; the species is at great risk of extinction. S1 indicates critical imperilment within a particular state, regardless of its status elsewhere. A number of factors contribute to the assignment of global and state ranks. These may include total population size, the number of occurrences, and threats. The Natural Heritage Program and NatureServe develop and maintain the information supporting this ranking system.

Table 1. Primary Natural Features at Chehalis River Surge Plain NAP and NatureServe Ranks

Community Common Name	NatureServe Rank
Freshwater tidal surge plain wetland	N/A
Bald eagle	G5 S4
Olympic mudminnow	G3 S2

Other Special Attributes

In addition to the primary natural features, the Chehalis River Surge Plain site supports species recognized by the Washington Department of Fish and Wildlife (WDFW) as conservation priorities through the Endangered Species and the Priority Habitats and Species (PHS) programs. These species include:

Table 2. Species of Concern and Priority Species found in Chehalis River Surge Plain NAP

Common Name (Scientific Name)	State Status	Federal Status
Pileated woodpecker (<i>Dryocopus pileatus</i>)	Candidate	----
Vaux's swift (<i>Chaetura vauxi</i>)	Candidate	----
Osprey (<i>Pandion haliaetus</i>)	Monitor	----
Reticulate sculpin (<i>Cottus perplexus</i>)	Monitor	----
Western brook lamprey (<i>Lampetra richardsoni</i>)	Monitor	Species of Concern
Band-tailed Pigeon (<i>Columbia fasciata</i>)	Priority Species	----
Wood Duck (<i>Aix Sponsa</i>)	Priority Species	----
Mink (<i>Mylocheilus caurinus</i>)	Priority Species	----

The site provides habitat for anadromous fish (fish that live part of their lives in fresh water and part in salt water) and critical spawning habitat for resident fish species, and habitat for numerous small and large mammals.

C. Preserve Acquisition

The Washington Natural Heritage Program inventoried the Chehalis River NAP site in 1988. After identification of the site's significant ecological features, DNR developed a preserve design and recommended it to the Natural Heritage

Advisory Council in March 1989. The Advisory Council recommended the site for establishment as a Natural Area Preserve.

DNR began acquiring land within the Chehalis River Surge Plain in 1991 to establish the NAP. To date, the DNR has acquired 2,643 acres, from willing sellers, in 28 separate transactions. Efforts to acquire the remaining properties within the preserve boundary will continue.

Acquisition is from willing sellers only; DNR cannot condemn private property for inclusion in the NAP. 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 surge plain area or by pursuing the listing of their lands in the Washington Register of Natural Areas.

Funding for land acquisitions at the CRSP NAP has been provided through the state Washington Wildlife and Recreation Program (WWRP), the federal National Coastal Wetland Conservation Program, and through private donation. WWRP provides the primary source of funding administered by the state Recreation and Conservation Office (RCO) through a competitive grant process.



Blue Slough: shrub and emergent wetland

Preserve Design

The current design of the preserve includes the freshwater surge plain wetland comprised of low-lying terraces bisected by the Chehalis River and more finely dissected by large tidal sloughs, many small slough channels and a few freshwater creek channels.

The preserve boundary includes much of the flood plain area between River Miles 3.8 and 10.5 of the Chehalis River. The existing area owned by DNR as the CRSP NAP includes portions of sections 13, 15, 16, 17, 18, 19, 20, 21, 22, 28, 29 of Township 17N, Range 8W, Willamette Meridian (Figure 1).

The entire site is less than 20 feet above sea level and most of it is flooded during extreme high tides. The area is tidally influenced, but the water that floods the site at high tide is mostly fresh water. Brackish water occasionally inundates portions of the banks of the Chehalis River.

The current preserve ownership consists of large contiguous and smaller isolated DNR NAP parcels interspersed among parcels owned by timber companies, Grays Harbor County, and other individual private landowners. The CRSP NAP also includes the abandoned Union Pacific railroad right-of-way that forms the southern boundary of the preserve.

Preserve ownership or management currently does not include the beds of navigable waters (bedlands) of the Chehalis River or associated sloughs that flow through the surge plain area within the boundary of the NAP.

D. Chehalis River Surge Plain (CRSP) NAP Management Planning Process

The CRSP NAP Management Plan provides functional guidelines for the site manager, other DNR staff as well as neighbors, stakeholders and the general public. The plan helps to identify priorities for management of natural features and public access to the site.

The plan describes how the DNR is applying policy and statutory requirements to specific management activities.

Limits of the Plan

The management objectives, actions and provisions outlined in this plan apply only to the CRSP NAP lands managed by DNR. 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.

In developing the management plan for the CRSP NAP, DNR staff conducted inventories and collected existing information from local citizens, agencies and Tribes.

DNR staff then circulated a draft management plan for stakeholder review, public review, and final approval by the Natural Heritage Advisory Council and DNR division and region managers. The following dates outline the chronology of the planning process:

November 14, 2007: Public meeting facilitated by John M. Kliem and Deborah A. Holden of Creative Community Solutions in Montesano, Washington.

December 2007–July 2008: draft plan development.

February 20, 2008: Stakeholder meeting facilitated by John M. Kliem and Deborah A. Holden of Creative Community Solutions in Montesano, Washington.

December 1, 2008: Public meeting facilitated by DNR to provide comment on the draft management plan in Montesano, Washington.

January 14, 2009: Washington Natural Heritage Council review of plan.

February, 2009: present plan to committees of the Washington State Legislature.



Double crested cormorants along the river

II. General Preserve Information

A. Physical Description

Ecoregional Context

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

This ecoregion characteristically has numerous streams and rivers, extensive coniferous forests (including Sitka spruce in a coastal fog belt), wetlands, bogs, riparian areas and coastal estuaries and dunes. Many of the rivers and streams are salmon-bearing and some of the estuaries are among the largest and best condition on the west coast. It is also an area of particularly high amphibian diversity.

At 2,711 square miles, the Chehalis River has the largest drainage basin of any river contained entirely within the ecoregion and is the second largest river basin within all of Washington State. The Columbia River system is far larger, but it is largely located outside of the Northwest Coast Ecoregion.

Climate

The CRSP area experiences a temperate maritime climate with cool, relatively dry summers and mild, wet and cloudy winters. The average temperature is 50.4 degrees F. The average annual precipitation is 83.7 inches. The skies are clear 45 percent of the time in the summer and 20 percent in the winter. Average relative humidity in mid-afternoon is about 65-70%. The average wind velocities during winter storm events are 50-70 miles per hour and can exceed 100 miles per hour.

Climate Change

Climate change has the potential to change important variables in the CRSP NAP environment; however, the effects this may have on the local environment and on the site's habitats are difficult to predict. Changes in sea level, predicted by most climate change models, would directly affect the site because of the low elevation of the entire wetland and the influence of tidal exchange. A rise in sea level could cause dramatic changes to, or even loss of, the surge plain ecosystem within the site. Changes in temperature, or changes in the amount or timing of precipitation, could change the plant community composition away from plants adapted to the current cool, coastal conditions. Changes in plant communities would likely trigger changes in the animal communities that use the site, as food sources, cover, and other habitat characteristics change. While no targeted research on this threat to

the preserve has been carried out, managers recognize that climate change will likely lead to changes in the habitats and species on the site. Decisions regarding what, if any, actions should be taken to address these changes will require a better understanding of the effects of climate change on these habitats and species, as well as what changes are actually occurring on the site.

Topography

The entire site is less than 20 feet above sea level, creating a very flat landscape contoured by river and slough channels.

Geology

Much of the lower Chehalis Basin is underlain by old ocean floor that emerged with the uplift of the Olympic Mountains. The hills and valleys were carved into these slabs of oceanic rock by erosion, resulting in low rounded hills and ravines. At the end of the ice ages, meltwater from the Puget Sound glaciers flowed down the Black River and Lower Chehalis. After the ice ages ended, sea levels rose by several hundred feet and flooded the mouth of the Chehalis. This created Grays Harbor, and caused the river valleys to fill in with sediment. Volcanic rocks (primarily basalt flows) underlie most of the basin, but have been overlain by sedimentary deposits of marine and non-marine origin or glacial material. Sedimentary rocks include those of the Eocene/Oligocene epoch and younger rocks of the Miocene epoch. Much of the basin possesses glacial deposits from at least four different glaciations. Alpine glaciers have flowed south from the Olympic Mountains, shaping the surface features of much of the lower Chehalis Basin. The major river valleys contain significant deposits of alluvial material. This material is often mixed with glacial deposits, forming a complex mosaic of unsorted material. (Envirovision 2000).

Soils

The flood plain soils within the CRSP NAP are primarily alluvium (sediment deposited by flowing water, as in a riverbed, flood plain or delta), but also include glacial drift and outwash. Alluvium soils in the surge plain appear as black, anoxic organic material over clay. Glacial drift and outwash soils are similar except that gravels underlie the clay.

The soils mapped by the Natural Resources Conservation Service show a mixture mostly of Ocosta silt clay loam and Salzer silt clay. Both are very deep, acidic, poorly drained soils that develop in alluvium. They both have a high water table and shallow rooting zone.

There are also mapped areas of Fluvuquents, Orcas peat, Chehalis silt loam, Rennie silty clay loam and Seastrand Variant muck. There is a tremendous amount of large woody debris, both buried within the alluvium and on the soil surface. This wood acts as an additional substrate for trees and shrubs.

Hydrology

The surge plain within the CRSP NAP developed due to a unique combination of factors relating to its proximity to the mouth of the estuary, low river gradient, tidal influences, and stream morphology. Water flows typically peak in winter months during high rainfall periods, and are lowest in late summer. Because of its large size, flat topography, and minimal level of development, the surge plain plays a significant role in storing water during flood events in the lower Chehalis River system.

The water quality and quantity of the Chehalis River and Grays Harbor estuary watersheds affect the quality and composition of the vegetation communities. Changes in salinity or frequency of inundation can alter the structure and composition of those plant communities at the site, as can excessive sedimentation.

The hydrologic features of the CRSP NAP and the aquatic and wetland communities they support are very sensitive to surrounding land uses outside of the NAP boundary, including water and soil manipulations. Management of this preserve should emphasize interactions of the site with the surrounding landscape, especially in regard to hydrological management issues.

Freshwater Surge Plain Wetland

The surge plain wetland along the Chehalis River includes tidal sloughs with no visible vegetation, a variety of herb-dominated communities, shrub-dominated communities, and wet forests. All of these communities are flooded during high tides and some are permanently flooded to varying depths depending on the tide level.

Most of the surge plain wetland is dominated by Sitka spruce trees. Dominant forest vegetation in this wetland is characterized as "wooly," having many limbs near the ground. The canopy is fairly open and the understory is dense.

Sloughs form a winding and intricate network not visible in aerial photos. Much of the area is flooded during higher high tides, and portions of it are flooded during each high tide. The wetland plays a critical role in absorbing and slowing flood waters during major events such as the December 2007 flood, providing a range of important ecosystem services to the surrounding communities. This key function filters sediment and provides an escape valve for water during extreme high water events.

B. Historic Use and Cultural Resources

Native American Use¹

Grays Harbor County takes its name from the broad, shallow bay that drains five rivers in southwest Washington. The original residents were members of the Quinault Tribe along the coast north of Grays Harbor and the Chehalis Tribes of the lower Chehalis River drainage. Other tribes in the area included the Queets, Humptulips, Satsop, Wynoochee, and Copalis. The Chehalis, Quinault, and Hoh tribes spoke the Coast Salish language closely related to other Salishan language groups in the Pacific Northwest. All the tribes used a trade jargon called Chinook.

Grays Harbor area tribes lived in permanent villages along rivers and lakes. Water defined their economic and cultural lives. They harvested salmon as the anadromous species swam upstream to spawn, as well as whales and seals along the coast. In the summers, hunters ranged inland and into the Olympic Mountains for game and to trade with other tribal groups. They developed a high degree of skill with canoes carved from cedar trees in a variety of specialized designs adapted to swift-flowing rivers, broad estuaries, and the sea.

European-American Settlement

The CRSP area has a lively history of pioneer settlement and logging. Numerous pilings still exist in the sloughs and main river channels throughout the surge plain. These are remnants of what was once an intricate network of log booms built to hold huge rafts of timber harvested from the adjacent uplands. Due to tidal inundation and extensive wetland areas, little development of the preserve area occurred beyond a few home sites and hunting cabins.

Recent History

Lands within the surge plain, excluding the preserve, are primarily under management as commercial forestlands. Selective logging occurred in the forested stands of the preserve sometime between 1888 and 1914. The likely species removed during this period were Sitka spruce, western red cedar and western hemlock. No harvest has occurred in recent years due a combination of factors, including low timber quality and volume as well as wetland regulations.

Historically, domestic animal grazing likely occurred in the upland areas on the preserve edge and in the preserve vicinity.

The Oregon Washington Railroad and Navigation Company built a railway line in 1909 along the southern boundary of the wetland which is now the CRSP preserve. The Milwaukee Railroad Union later purchased this line, followed by the Union Pacific Railroad. Eventually, Union Pacific abandoned the line, pulled

¹ http://www.historylink.org/essays/output.cfm?file_id=7766

the rails, and sold the property to a private company. DNR later purchased that portion of the line adjacent to the preserve.

C. Land Uses Within and Adjacent to the NAP

Major landowners within the surge plain include the Department of Natural Resources Natural Area Preserve, Weyerhaeuser Company (which has designated part of its ownership within the surge plain as the Norm Dicks Wildlife Conservation Area), Port Blakely Tree Farms, Anderson & Middleton, Rayonier Forest Resources, and smaller undeveloped timber property landowners. The Grays Harbor Chapter of Trout Unlimited owns a recreation site adjacent to the preserve, Friends Landing, which is located on the north side of the Chehalis River. Agricultural land and homesites occupy the adjacent uplands to the south and east.

Certain aquatic lands within the Chehalis River and Preachers Slough are owned and managed by the DNR Aquatic Lands Program. These lands include bedlands below ordinary high tide. There are historic leases for log booms and other aquatic uses over these bedlands. The role of Aquatic Lands management within the preserve is further addressed on page 44.

Central Park is an unincorporated community that lies immediately north of the NAP. The community has a population of 2,558 (2000 US Census). Land use is primarily residential with very few businesses. Although the community does have a water system, it has no sewage collection system or treatment facility. Homes in the area use septic systems to treat waste water.

Fire District No. 2 provides fire protection to the surrounding area, and Grays Harbor County provides law enforcement.

The railroad right of way that is part of the NAP also extends to the east through the small community of Melbourne. A formal trail has not been developed on this section of trail.

D. Public Use

The preserve is popular with a variety of different recreational groups. Groups frequently using the site include:

- Hikers on the interpretive trail located on the old railroad grade.
- Bank fisherman accessing the river from a spur on Preachers Slough Road.
- Anglers and hunters using the area via boat access and infrequent camping along the main river channel.
- Paddlers launching canoes and kayaks from the Blue Slough Access and Preachers Slough Road.
- Bird and wildlife watchers.

The impenetrable vegetation beyond the shoreline discourages most recreationists from venturing from their boats into the dense thickets of the preserve.

Public and educational use of the 3.5-mile interpretive trail is supported by overall site management. There is one completed trailhead parking area and two less developed water access sites on the Chehalis River and on Blue Slough.

E. Applicable Local, State, and Federal Regulations

This section summarizes regulations that affect planning for the CRSP preserve. This general regulatory framework shapes and limits activities and projects that are proposed within the plan.

Wetlands

Grays Harbor County classifies wetlands as all marshes, bogs, and swamps defined in the 1958 publication "Peat Resources of Washington." Category 1 wetlands are those falling within the jurisdiction of the Shoreline Management Act, and nearly all of the land within the CRSP supports Category 1 wetlands.

For protecting wetlands, the county relies on its Shoreline Master Program, the Grays Harbor Estuary Management Plan, subdivisions code (Title 16 Grays Harbor County Code), health and safety code (On-Site Sewage System, Chapter 8.16 GHCC), and the environmental review process through the State Environmental Policy Act (SEPA).

In addition to these local regulations, Grays Harbor County relies on the federal government to protect wetlands through Section 404 of the Clean Water Act.

Forest Practice rules also provide protection for wetlands and streams affected by any future timber removal activities in the area.

Grays Harbor County Regulations and Policies

Conservation of Resource Lands of Long-Term Commercial Significance²

The only resource lands designated within the boundary of the management area are forestlands of long-term commercial significance. The county identifies these lands as private properties enrolled in Open Space pursuant to Chapter 84.33 or 84.34 or lands owned by a local, state, or federal agency.

Critical Areas Protection

Critical areas within the Chehalis River Surge Plain include wetlands, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat conservation areas. Grays Harbor County relies on a variety of regulatory provisions to protect critical areas rather than a single ordinance.

² Grays Harbor County classified and designated critical areas and resource lands of long-term through *Resolution 92.39*.

Frequently Flooded Areas

Regulations relating to frequently flooded areas within the county fall under Chapter 17.56 GHCC. This chapter within the zoning ordinance creates a flood plain overlay district with boundaries based on the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency. The county requires permits for all development within the flood plain to assure meeting provisions for flood hazard reduction.

Geologically Hazardous Areas

The Grays Harbor County Building Code is the regulatory tool used by the county for regulating development in seismic hazard areas. At the time of adoption of the critical areas resolution, the county did not have the best available science currently published on seismic hazards. Present mapping by DNR shows that the area has a moderate to high susceptibility to liquefaction and a Site Class D rating for amplification for ground shaking. Additionally, the site is completely within the Tsunami inundation zone.

Fish and Wildlife Habitat Conservation Areas

Grays Harbor County has chosen not to designate fish and wildlife habitat conservation areas within its jurisdiction. There are no specific provisions to protect these areas outside of relying on the Grays Harbor Estuary Plan and the Forest Practices Act.

Zoning

Title 17 of the Grays Harbor County Code (GHCC) regulates zoning within the county. The majority of the NAP lies within the General Residential Five (G-5) zoning district.³ This district provides for a wide range of uses consistent with low levels of public facilities and services. Minimum lot size in the G-5 district is five acres.

The northwest corner of the NAP lies within the Industrial District (I-2). This zone extends all the way to unincorporated Junction City. This district allows a wide range of intensive permitted uses as defined by RCW 39.84.020:

"Industrial development facilities" means manufacturing, processing, research, production, assembly, warehousing, transportation, public broadcasting, pollution control, solid waste disposal, energy facilities, sports facilities, parking facilities associated with industrial development facilities as defined in this section or with historic properties as defined in RCW 84.26.020 and industrial parks.

Other permitted uses include research and development laboratories, technical and vocational schools, transportation and utility facilities, and light industrial uses.

³ Chapter 17.24 GHCC

Conditional uses in this district allow automobile wrecking and childcare centers. There is no minimum lot size in the I-2 District.

Grays Harbor Estuary Management Plan

Shoreline management within the NAP falls under the jurisdiction of the Grays Harbor Estuary Management Plan. The jurisdiction of this master program extends from where tidal influence ends on the Chehalis River to the mouth of the estuary. The entire NAP is within Planning Area I and extends over Management Units 20, 22, and 24.

Management Unit 20 covers an area that includes Mox Chuck Slough area north of the Chehalis River. This is a “conservancy managed” unit under the county plan and does not allow activities that hinder its natural characteristic as a natural water storage area. Special conditions allow for the extraction of aggregate outside of the river.

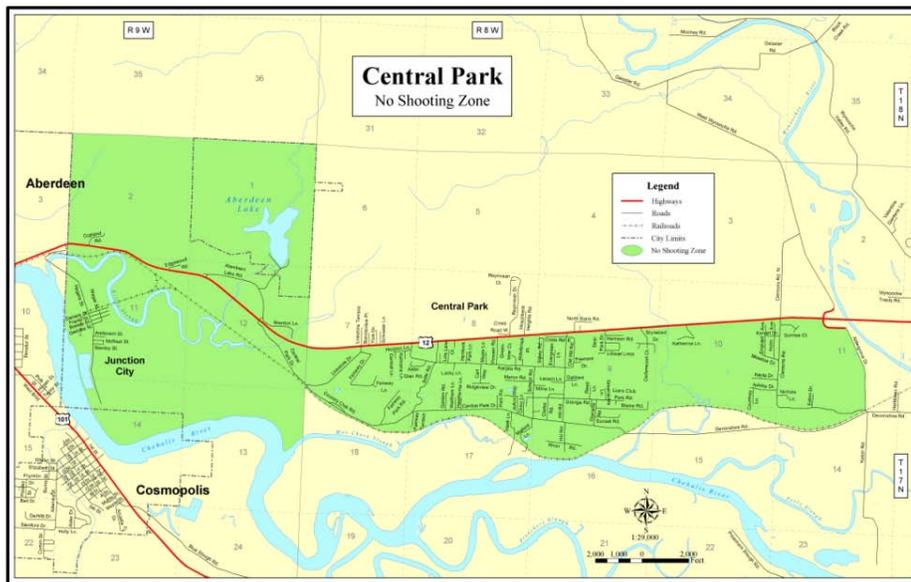
Management Unit 24 also is a “conservancy managed” unit located south of the Chehalis River and encompasses Blue and Preacher Sloughs. It has similar use restrictions as Management Unit 20. The management unit does allow maintenance or redevelopment of the railway.

The eastern portion of the NAP lying north of the Chehalis River is Management Unit 22. This Rural Agriculture unit is managed for agricultural activities and aggregate extraction. Dikes may be allowed to protect agricultural properties.

No Shooting Zone

Section 9.08.020 of the Grays Harbor County Code prohibits the discharge of firearms in specified areas of the county. The map in Figure 3 delineates the extent of the Central Park No Shooting Zone.

Figure 3. No Shooting Zone



Water Resource Inventory Area (WRIA) 22 & 23

The CRSP NAP lies within Water Resource Inventory Area (WRIA) 22. The Chehalis Basin Partnership is the Lead Entity for the WRIA and the agency responsible for overall watershed planning in the five-county area. Grays Harbor County provides staff support for the organization.

Two policy documents are important for protecting water and salmon resources within the CRSP NAP: The Chehalis Basin Salmon Habitat Restoration and Preservation Work Plan for WRIA 22 and 23 (2007) and the Chehalis Basin Watershed Management Plan (2004)⁴.

The Work Plan is the Lead Entity strategy for providing guidance to project planners and funding agencies in developing, evaluating, and implementing salmon habitat restoration and protection actions within the basin. This document is a critical component of applications for funding before the Salmon Recovery Funding (SRF) Board for restoration and protection projects that benefit salmonids.

The State Environmental Policy Act (SEPA):

SEPA requires governmental agencies to consider the environmental impact of proposals before making project decisions. The management plan for the Chehalis River Surge Plain NAP is exempt from SEPA due to the inherent protection and restoration focus of management. Thus the plan does not require preparation of an environmental checklist. Management activities that have the potential to impact the environment, such as certain trail development proposals, will undergo individual project review through SEPA.

⁴ Both documents are available through http://www.co.grays-harbor.wa.us/info/pub_svcs/ChehalisBasin/Index.html



Lady fern atop rotting piling

III. Natural Features Description

A. Vegetation

Most of the surge plain wetland is dominated by Sitka spruce, with mature trees ranging from about 50 to more than 200 years old. Other common trees on the site include red alder and western red cedar. Trees are relatively widely-spaced, leaving a fairly open tree canopy and dense, shrubby understory of red-osier dogwood and salmonberry. Skunk cabbage and slough sedge are also common in the understory. Fallen trees and logs are often covered with salal and also provide an important substrate on which Sitka spruce trees become established. This Sitka spruce-dominated vegetation represents the “Sitka spruce / red-osier dogwood / skunk cabbage forest vegetation” type listed under the Primary Natural Features section.

Some parts of the site support shrub- or herb-dominated vegetation types without trees. The shrub types mostly consist of willow species and red-osier dogwood, although there are also dense patches of spirea. These shrub areas range from being flooded during each high tide to being permanently flooded and soils tend to be soft and mucky with relatively deep organic matter. Lady fern and skunk cabbage are also typically present in these areas. This is representative of the “red-osier dogwood–willow species shrubland” and “lady fern herbaceous vegetation” types listed in the Primary Natural Features section.

Lyngby's sedge forms nearly single species swards on low banks along the Chehalis River and some of the sloughs. These areas are flooded during each high tide, and probably are occasionally flooded with brackish water. They represent the “Lyngby's sedge herbaceous vegetation” type. Softstem bulrush can also be found in nearly pure stands, often mixed with small-fruited bulrush, while other areas are very diverse. This community is flooded during each high tide and represents the “softstem bulrush herbaceous vegetation” type. Cattail dominates large areas, sometimes occurring with softstem bulrush. It typically forms dense swards which range from being permanently flooded, to being flooded only during high tide. These areas represent the “cattail herbaceous vegetation” type listed in the Primary Natural Features section.

A list of plant species known to occur on the site is included in Appendix B.

B. Fish and Wildlife

Although complete surveys have not been conducted, the surge plain is known to support a number of fish, bird, and mammal species.

Fish

Olympic mudminnow

The Olympic mudminnow lives only in western Washington and is rare outside of the Olympic Peninsula and the Chehalis River Basin. The current distribution of the Olympic mudminnow includes the southern and western lowlands of the Olympic Peninsula, the Chehalis and lower Deschutes River drainages, and south Puget Sound lowlands west of the Nisqually River (Mongillo and Hallock 1999).

Olympic mudminnows live in slow-moving streams, wetlands, and ponds in the coastal lowlands. The best habitats appear to have soft, muddy bottoms, with little to no water flow, and thick aquatic vegetation. The species has a restricted tolerance for water current and salinity, but a wide tolerance for temperature and oxygen. Their ability to breathe atmospheric oxygen allows them to live in oxygen-poor water where predator fish can't follow.

Mudminnows are not actually minnows at all, but are related to the pike and musky family. They lie in wait for their prey, which consists mostly of small crustaceans and insects. Spawning takes place during late fall, subsides during the winter months, and picks up again from March until June. Peak spawning usually takes place in April and May.

Although most populations appear to be stable, the species is listed as "Sensitive" in Washington due to its limited range and the high rate of wetland habitat loss that the region has experienced. According to the Washington State Department of Fish and Wildlife, "State Sensitive" species are "any wildlife species native to the state of Washington that is vulnerable or declining and is likely to become endangered or threatened throughout a significant portion of its range within the state without cooperative management or removal of threats."

Surveys confirm that the Olympic mudminnow inhabits one area of the NAP and the presumption is that they exist throughout the site. A complete survey of the species within the NAP remains to be completed.

Salmonids

The Chehalis River Surge Plain provides rearing and migration habitat for a number of salmonid runs, including spring and fall Chinook, coho, fall chum, and both summer and winter steelhead. These fish spawn further upriver and in various tributaries and the young fry return to the ocean via the Chehalis River. The surge plain provides important habitat for these juveniles, where they can gradually adjust to salt water conditions and feed in a highly productive environment prior to returning to the ocean. The river channel and sloughs within the preserve are particularly important for juvenile coho, which

are often found rearing during winter and early spring, prior to migrating into salt water or moving back upstream for extended freshwater rearing. The surge plain also provides overwintering habitat for Chinook and coho that may be forced downstream during high river flows. The sloughs within the preserve have low-velocity water flows and provide “refugia” for young fish.

Other Fish

Other fish found in the surge plain include lampreys, sturgeons, smelts, sticklebacks, sculpins (commonly called "bullheads"), and flounders. Minnow species include the northern pike minnow, speckled dace, long-nosed dace, and peamouth.

Exotic Fish Species

Exotic fish species introduced to the west coast that now reside in the Chehalis River include American shad, bass, sunfish, carp, yellow perch, and catfish. These fish can directly impact native fish and amphibians by preying on them, or indirectly by reducing available food resources. The population levels of these fish in the vicinity of the preserve are unknown.

Birds

Appendix C contains a list of bird species that have been found within the preserve, including various song birds, waterfowl, raptors, and gulls. A total of 75 species have been documented on the site, including 50 that are likely breeding, 16 that are possibly breeding, and nine migrants or vagrants.

There are several active and alternative bald eagle nests and active osprey nests within the preserve. These species also forage in the river and sloughs. Band-tailed pigeons also likely nest on the site, and the river and slough banks exposed during low tides provide important mineral sites where these birds ingest salts early in the breeding season and again in late summer.

The preserve supports a variety of nesting habitats including:

- large shrub patches, used by many song birds (e.g., warblers),
- emergent wetlands, used by various species (e.g., Virginia rail),
- large trees, used by raptors (e.g., osprey, bald eagle),
- shorelines, used by shorebirds (e.g., spotted sandpiper),
- river banks, used by bank-nesting birds (e.g., bank swallows, kingfishers),
- snags, used by cavity nesting birds (e.g., Vaux’s swift and pileated woodpecker, both State candidate species, and wood ducks, a State priority species).

Mammals

Information about mammal use of the site is limited; however, the following species have been observed: black bear, beaver, raccoon, deer, river otter, Douglas squirrel, varying (or snowshoe) hare, and harbor seal.

Amphibians and Reptiles

No formal amphibian surveys have been completed at the CRSP; however, Red-legged frogs are known to occur on the preserve. Garter snakes and other common NW amphibians and reptiles are likely to be present.



Caspian tern circling over the river

IV. Management Policies and Goals

A. General Management Guidance

The Washington Natural Heritage Program identifies natural area preserves, 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 preserving natural features of scientific or educational value.

B. Management Goals

The guiding principle for managing the Chehalis River Surge Plain NAP is to permit natural ecological and physical processes to predominate, while controlling activities that directly or indirectly modify them. Exceptions may occur when a primary feature would be jeopardized without active intervention.

Management activities will also be implemented to maintain the site in the best condition possible for research and education. Removal or alteration of vegetation, soil, or rock is not allowed except where specifically authorized as part of this plan.

Management goals for the Chehalis River Surge Plain include the following:

- Protect the site's primary natural features.
- Provide for public access compatible with management of the preserve.
- Monitor threats to the natural features and the health of natural systems.
- Facilitate environmental education and research on the site.
- Manage non-native and invasive plant species.
- Protect cultural and archeological sites.

C. Public Access Policy

The Chehalis River Surge Plain NAP has special qualities and resources that attract people to the site.

The following is a summary of the DNR NAP Public Access Policy that guides public access and uses. See Appendix D for the full policy.

The Natural Areas Program prepares site-specific management plans for each NAP managed by the DNR. Protecting the natural features for which an NAP was established and maintaining natural processes are top priorities for each plan. Additionally, management plans specify types and levels of public access allowed, including management and monitoring recommendations.

Public use on NAPs is generally limited to:

- Authorized non-consumptive uses that focus on scientific study or educational purposes,
- Appropriate location, intensity, timing, and type of low-impact access outside of environmentally sensitive areas, when determined by the department through case-by-case analysis of each NAP to be consistent with conservation management and the primary purposes of research and education, or
- Traditional established aboriginal rights, or rights recognized by treaties or applicable court rulings.

The DNR may authorize land access for consumptive uses (such as hunting, or plant harvesting) only when the activity is determined:

- To be the most appropriate management tool to protect the natural features for which a preserve was designated, or
- In consultation with the WDFW, to be the most appropriate fish or wildlife management tool, or
- To increase an NAP's scientific or educational value when consistent with conservation management and non-degrading to the natural features for which the NAP was designated, or
- For a specific circumstance, to be consistent with conservation management and the primary purposes of research and education, occurring outside of environmentally sensitive areas, and of appropriate location, intensity, and timing.

Where allowed, public access is carefully controlled and monitored. Access to a preserve may be limited until resources are available to develop and properly implement the management plan or to analyze specific access requests.

D. Management Actions Summary

Table 3. Management Actions Summary

Goal	Management Action
Protect Primary Features	<ul style="list-style-type: none"> • Implement a strategy to protect the site’s primary features that includes monitoring.
Public Access	<ul style="list-style-type: none"> • Develop opportunities for public access with input from local and regional users. • Guide low impact public uses to appropriate areas. • Provide informational and educational signs, parking and water access; designate trails and vehicle barriers. • Coordinate with enforcement officers.
Monitoring	<ul style="list-style-type: none"> • Monitor wetland plant community condition. • Monitor invasive species. • Monitor potential impacts to natural features. • Pursue grants and facilitate partnerships to meet monitoring goals.
Environmental Education	<ul style="list-style-type: none"> • Encourage continued use of interpretive trail facilities and curriculum tools by local schools. • Train additional field trip leaders to work with students. • Sponsor spring and summer field trips for local residents.
Non-native invasive species	<ul style="list-style-type: none"> • Implement weed management plan. • Restore areas where native vegetation has been damaged, especially on shorelines.
Archaeological & Cultural Sites	<ul style="list-style-type: none"> • Coordinate with Confederated Tribes of the Chehalis and the Quinault Indian Nation to ensure that cultural sites are not disturbed and information is regularly exchanged regarding projects. • Complete cultural resource surveys.



Old boom pilings in Preachers Slough

V. Management Guidelines and Strategies

A. Primary Features

Management of the wetland forest and other wetland communities will promote structural and species diversity within the stand while protecting the wetland understory communities. Generally this will be achieved through protection and preservation of natural processes.

Management actions:

Monitor population trends and factors which may adversely affect the forest in order to determine future management actions. Monitor for changes in the relative abundance of native and non-native understory species. When non-native invasive species are observed to be threatening the primary features or ecological processes of the site, a weed plan that address these issues should be developed and implemented.

B. Public Access

The intention of the natural areas system is to secure representation of all ecosystems and rare plant species in the state. Because these lands are not easily replaceable if damaged, management of them should be cautious with regard to public use. Compatible public uses are identified in the plan, and activities that threaten the important features of the site will be prohibited or directed to more appropriate areas.

Decisions about public use will be in accordance with RCW 79.70 and the DNR NAP Public Access Policy, Appendix D in this document. DNR will carefully evaluate potential impacts of proposed activities on the natural features of the site. The DNR natural areas ecologist is responsible for evaluating research requests and the DNR region natural areas manager is responsible for coordination and management of use within the NAP.

DNR can only approve public access in areas that it owns and manages. Public access across private lands that are within or adjacent to the preserve boundary is determined by the private landowner and not necessarily available to the public.

Available public access for people with disabilities is an issue of concern that DNR intends to address on a case-by-case basis. If the agency undertakes public access projects within the site, facilities will be fully accessible where possible. Additionally, DNR will continue to keep the local community informed and involved through one-on-one interactions and through community meetings when needed.

The following is a discussion of public use occurring on the site and the subsequent management actions developed to meet the NAP management goals listed above.

C. General Public Use

Public use of the preserve includes a variety of activities taking place in several areas of the preserve. The former railroad grade trail provides hiking, bird watching, and educational use along the southern margin of the preserve. Bank fishing, kayaking and canoeing, and shoreline access are possible at Blue Slough and the Chehalis River bank adjacent to Preachers Slough Road.

The objectives for establishment and management of natural area preserves (per the enabling legislation, RCW 79.70) specify educational and research activities as compatible with natural area protection. The act was amended in 2002 to allow for low impact public use within appropriate buffer areas of NAPs. Access will be designed to protect the important features of the preserve and allow for public enjoyment of the site.

Public access development will comply with the Americans with Disabilities Act of 1990 and other applicable local codes and regulations. The existing trail begins with a compacted gravel section and barrier-free boardwalks and a viewing platform. Further development will continue this model with parking and compacted gravel trails designed to be barrier free and rustic. Friends' Landing is located along the river just north east of the preserve and provides fully accessible camping, water access, a boat launch, dock, and fishing shelters with paved trails.

The following actions provide directed access to increase site protection and also enhance facilities for visitors.

Management actions:

DNR will design public access areas with input from the community and user groups. Informational outreach materials will be provided to visitors. The message will define uses that are allowable on the CRSP preserve and why other uses are not allowed. Potential impacts from public use will be monitored on a regular basis. Current activities that negatively affect the area include garbage dumping, camping, campfires, tree and shrub cutting, and off-road vehicle use. Management actions include:

- Remove trash regularly and enforce littering laws.
- Clearly establish areas where vehicles are allowed and limit vehicle access beyond those points.
- Post informative signs at key access points into the preserve.
- Development projects will be designed to comply with ADA requirements to the greatest extent possible, given the natural, semi-primitive character of the site.
- Provide natural area and CRSP interpretive information along trails to help foster stewardship of the site.

- Coordinate with partners and user groups to increase volunteer stewardship.
- Establish a local volunteer corps that draws on neighbors, conservation groups and recreation groups to help maintain facilities and restoration projects, and support educational events.

D. Fishing

The Chehalis River Surge Plain has been popular with anglers for many years. Anglers access multiple fishing locations inside the preserve.

The existing access points at Blue Slough and the Chehalis shoreline near Preachers Slough occur on formerly developed areas such as an old log dump and an abandoned farm/homesite. Because they are already substantially impacted, these areas are good candidates for continued access. These sites have potential for enhancement for a variety of uses including better fishing access.

Management actions:

Access for fishing will be directed to areas that have historic fishing use and have prior human impact. Developed trails and signing will guide anglers to these locations.

DNR will work with focus group partners to educate anglers about the NAP and about appropriate uses of the site. In addition, funding sources and partners will be identified to help with maintenance and funds for access support.

E. Hunting

Hunting occurs at low intensity on the preserve. There is evidence of hunting for deer, bear, and migratory waterfowl. The tidal characteristic of the surge plain and the density of the forest limit hunting locations and accessibility.

DNR does not regulate hunting or trapping activities; however, the department does limit access for hunting on NAPs if the activity is inconsistent with the Public Access Policy.

DNR does not restrict use of navigable waters. Hunters can access the waters within the preserve.

Management actions:

DNR will manage hunting access on the preserve in coordination with the Washington Department of Fish and Wildlife. For safety reasons, hunting is not allowed from or across trails, or in developed public areas frequently used for walking, small boat launching, educational field trips, bird watching, or other forms of low impact public use. This includes the 3.5 mile former railroad grade trail, the Blue Slough trailhead and water access site, the Preachers Slough

trailhead, and the Chehalis River shoreline access area at the end of Preachers Slough Road. The safety and enjoyment of all visitors will be safeguarded.

Hunting for waterfowl and other wildlife is permitted in undeveloped areas of the preserve, which constitutes the majority of land and water at the site. If this activity poses a threat to other visitors or important features of the preserve, hunting access may be revised to safeguard the public and the integrity of the site.

F. Research and Educational Use

The CRSP NAP is open for approved scientific research and educational activities, providing they do not adversely affect the site's natural features. Research, monitoring, and inventory projects by potential researcher groups, such as colleges, universities, and relevant research laboratories, are encouraged. Such projects must be pre-approved by the Natural Areas Ecologist and Region Natural Areas Manager. Interested parties should contact the Region or Natural Areas Program offices regarding research proposal guidelines. 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 on a yearly basis.

Teachers are free to use the interpretive trail to meet their educational goals for natural history field trips. We encourage teachers to contact the natural areas manager for access to more educational materials and the possibility of scheduling an experienced interpreter to join the class. The current curriculum guide provides activities that focus on habitat and species, watershed activities, and functions and values of wetlands. Copies of the guide are available through the Chehalis River Surge Plain NAP Manager or Educational School District 113.

For access to other portions of the site, or to arrange for groups larger than 20, contact the Pacific Cascade Region office at 360-577-2025.

Management actions:

The natural areas ecologist will evaluate research requests. Certain research projects (very complex projects or those that may request the use of disruptive sampling techniques) may also require review and approval of the Natural Heritage Advisory Council.

The CRSP Nature Trail

DNR maintains a portion of the abandoned Union Pacific Railroad right-of-way as a nature trail to allow the public the opportunity to experience and learn about the preserve's significant ecological and historical features. A series of interpretive signs covers topics including native Indian and recent history, birds, plants and trees, geology, and invasive species. A viewing platform at the edge of Preachers Slough provides a large area for groups to congregate on field trips. The nature trail allows pedestrian and bicycle access along the historic railroad right-of-way that forms the southern boundary of the preserve.

Management actions:

The trail offers opportunities to explore, appreciate, and contemplate the natural features of the surge plain. In order to ensure that the educational and interpretive values of the trail are not compromised, motorized vehicles (except administrative vehicles) and horseback riding are not allowed.

Frequent maintenance is required to keep the trail in good condition; this is accomplished through volunteer stewardship and the DNR Washington Conservation Corps (WCC) crew.

Proposed improvements to the trail include a completed parking area and trail head at the western end at Blue Slough, and compacted crushed gravel surfacing on three miles of trail to bring the entire trail up to a barrier free standard.

G. Tribal Interests, Archaeological & Cultural Sites

The CRSP NAP is important to several Native American tribes with historic and current land and resource use of the area. It is part of the Quinault Indian Nation's treaty fishery area, and is also important to the Chehalis Tribes and their upstream fishery and land ownership. This plan does not weigh the various interests but simply recognizes that both groups have management interests in the resources supported by the preserve.

To date, there have been no archaeological surveys or assessments completed specifically for the CRSP NAP. The lands in and surrounding the CRSP NAP are known to have been inhabited and used by native people and may include important cultural sites. More information is needed to ensure that any existing sites are correctly protected.

Native plant communities at the CRSP NAP may have special values for nearby Tribes. Gathering information regarding these potential and historic uses will help guide actions in the plan.

Management actions:

- Consult with the Quinault Indian Nation and Confederated Tribes of the Chehalis regarding actions considered as part of this plan.
- Complete cultural resources surveys and consultation, which are required prior to any development or earth moving project.
- Consult with nearby Tribes regarding native plant uses that may be protected or enhanced through management and restoration.

H. Mining

Mineral leases exist within the CRSP NAP on both private and DNR-managed lands. Drilling, mining, or uses of mineral or energy resources on the NAP are incompatible with management objectives. The Natural Areas Program will seek acquisition of mineral rights where possible. RCW 79-11-210 requires the reservation of mineral rights, in perpetuity on state trust lands; therefore, mineral rights are not transferred if these lands are conveyed to natural area status.

Management actions:

- The department's Natural Areas Program should initiate negotiations with individuals and corporations to obtain underlying mineral rights on the NAP through gift, trade, or purchase.

I. Roads and Utility Rights-of-Way

County roads and state highways border the preserve. Roads are the most intrusive element within and adjacent to the preserve and are the source for hazardous and solid waste dumping as well as the spread of noxious weeds.

Preachers Slough Road has several problem areas that are a high priority for resolution and management action. The end of the road in Section 22 has failed and should be abandoned following transfer from Grays Harbor County. Fallen trees from the storm of December 2007 effectively blocked off the failed portion of the road. Other challenges include dumped vehicles, garbage, and illicit activities that sometimes occur at the last drivable pullout on the road.

Preachers Slough Road fully blocks important off-channel fish habitat. Although the slough is accessible to fish at its western confluence with the Chehalis River, opening the eastern connection would provide access to miles of critical rearing habitat for juvenile fish.

Management actions:

- Manage roads within the preserve to minimize impacts on the environment while allowing for public access to the Chehalis River, Preachers Slough and Blue Slough where possible. Maintain Preachers Slough Road in conjunction with Grays Harbor County until DNR acquires complete ownership. Restore the failing portion of Preachers Slough Road to its natural condition and block vehicles from entry.
- Restore fish passage to Preachers Slough where the road currently blocks it. Pursue this project in partnership with Grays Harbor County, local salmon recovery groups, Tribes, USFWS, WDFW, and WWRP restoration

grants. To preserve public and tribal access, it is likely a bridge will be required.

- Erect "No Dumping" signs where needed.
- Maintain access roads mechanically rather than by spraying with herbicides if possible. Seek cooperative agreements with state highway and the county's Department of Public Services to maintain roadways in a manner compatible with preserve management.

J. Wildlife

The habitat within the CRSP supports a rich diversity of wildlife, including many WDFW-listed priority species. There has been little inventory of wildlife in the NAP partly due to the inaccessibility of the site. DNR will seek to obtain further information on wildlife diversity within the surge plain.

DNR will work with WDFW biologists and others on protection of wildlife and wildlife habitat within the surge plain. DNR will also work with WDFW biologists, The Nature Conservancy, volunteer stewards, or other researchers to conduct wildlife inventories within the CRSP.

Non-native invaders to the preserve include opossum, nutria, and starlings, all of which may have adverse impacts on native species through nest depredation, preemption of nesting cavities, and destruction of vegetation.

The NAP will monitor non-native animal species and implement a control program if they are found to have a significant adverse impact on native species.

Management actions:

Work with WDFW biologists and volunteer stewards to provide monitoring of the preserve, to inventory wildlife species diversity and abundance, and to note concerns related to invasive or non-native species. There is no active management (reintroduction, removal, etc.) of wildlife species planned at this time.

K. Insects and Disease

The wetland forests of the preserve 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 process. Exceptions to non-intervening management may include cases when non-native, introduced insects or other pathogens create deleterious conditions in the forested buffer, law (RCW 76.6) requires management action, or if the key natural features of the preserve are jeopardized by lack of intervention.

Management actions:

Natural Areas staff, other regional employees and volunteer stewards will monitor the forested portions of the preserve for signs of insects and disease. If warranted, DNR forest pathologists will visit the site to diagnose suspected problems and recommend actions based on the above policies.

L. Fire Management

DNR is required to protect both state and private lands from wildfire (RCW 76.04.016). Fire suppression in the Chehalis River Surge Plain focuses on protecting life, resources, and property. Contrary to the guiding principle of allowing natural processes to happen, management objectives in this plan must focus on fire suppression.

Little information is available on the fire history of the Chehalis River Surge Plain Area. The near coastal zone climatic conditions of the preserve and primarily wetland habitat limit the frequency and intensity of naturally occurring fires. Forests in this area can burn, but fire-return intervals are long (hundreds of years) (Agee, 1993).

The most probable source of wildfire ignition within the preserve or preserve vicinity would be human-related, primarily due to recreational use. Although it is rarely a cause of fire in the CRSP vicinity, lightning is also a potential ignition source.

Due to the wetland conditions prevalent throughout most of the preserve, a fire that did start would probably spread slowly, if at all. The patchy distribution of the forest canopy also makes it unlikely that a crown fire would establish or spread.

Management actions:

See Appendix E for management actions.

M. Introduced Weed Species

For the purposes of this plan, an introduced weed species is a plant species that is not native to the State of Washington, and has the potential to become invasive, thereby posing a threat to site management goals. Invasive introduced species can repress or exclude native species, and are widely viewed as one of the greatest threats to ecosystem health and biodiversity worldwide. Population inventory, assessment and control of invasive weed species are top priorities in the management of the CRSP preserve.

Upland weed species of concern include:

- English ivy (*Hedera helix*)
- Scot's broom (*Cytisus scoparius*)
- Holly (*Ilex aquifolium*)
- Himalayan blackberry (*Rubus discolor*)

Wetland plant communities dominate the surge plain, so species that threaten the quality of wetlands are of primary importance. Five introduced aquatic and riparian weed species are currently of concern at the CRSP NAP:

- Purple loosestrife (*Lythrum salicaria*)
- Yellow Iris (*Iris pseudacorus*)
- Reed canarygrass (*Phalaris arundinacea*)
- Bohemian knotweed (*Polygonum bohemicum*)
- Parrotfeather (*Myriophyllum aquaticum*)

Detailed information about weed management strategies and action can be found in Appendix H.



The Lady Washington sails upriver through the preserve

N. Aquatic Lands

DNR is responsible for managing approximately 2.6 million acres of state-owned aquatic lands. These aquatic lands include tidelands, shorelands of navigable rivers and lakes, beds of marine and fresh waters, lands in harbor areas and waterways, and even some filled aquatic lands, which now look like uplands. The CRSP contains a significant aquatic lands component and these bedlands are a critical habitat of the Chehalis River. Therefore, the Aquatic Resources program has an important role in management of aquatic related issues such as public use and access, pilings, leases, invasive species, restoration, shoreline development and commercial use of the beds and shore of the Chehalis River. http://www.wadnr.gov/aqr/manuals/pdfs/8_3recode.pdf

Management Actions

The natural area manager will consult with Aquatic Resources land managers regarding bedland, shoreline, slough and river restoration and management needs. The programs should collaborate and seek partnerships in the following areas:

- Protection through acquisition of additional bedlands and shorelines within the CRSP boundary.
- Education and outreach to the public, including information about aquatic lands through signs located on the preserve near aquatic land use areas.
- Improve appropriate public access to water, minimizing project impacts and using quality designs.
- Assess pilings and other water or shoreline based structures for potential contamination issues.
- Aquatic invasive species control.
- Project coordination.

VI. Monitoring of Natural Features

The list below contains the important monitoring needs identified by the Natural Areas Ecologist and other contributors to the plan. These are considered priorities for the Chehalis River Surge Plain NAP because they focus on the site's primary natural features. Invasive species distribution will be the primary focus of monitoring, while the remaining monitoring will be conducted as funding and staffing allow, or through partnerships:

- Invasive species distribution
- Shoreline conditions
- Olympic mudminnow population status
- Surge plain wetland plant community condition
- Climate change effects

Invasive species are of primary concern because they are a direct threat to most of the preserve's features and they require frequent monitoring to assess distribution and trends. Periodic inventory and mapping will provide feedback on the extent and distribution of invasives, their impact on the site's natural features, and on the level of success of control efforts.

Shoreline conditions are an important factor to monitor because these are sensitive locations that are easily impacted and they have direct effects on water quality in the sloughs and river. Methods for monitoring shorelines could include measurements of vegetation cover and of exposed soils within particular stretches of the river and sloughs.

Monitoring the status of the Olympic mudminnow population would provide direct feedback on this primary feature of the site, as well as on the conditions of the surge plain wetland community which is an important component of its habitat. Methods for monitoring this species could include periodic capture and release sampling, and body measurements to assess condition of individuals. Olympic mudminnow monitoring should be coordinated with WDFW, which has conducted assessments and monitoring of some populations within the state.

Surge plain wetland plant communities would be monitored to assess their species composition and structure, and to assess long-term changes in these variables. Methods could include standard forest vegetation plots, as well as periodic assessment of aerial photography. Effects of climate change on the site could be assessed by a variety of measures, including recording water levels at the site, establishing and monitoring trends in shoreline location, and tracking shifts in plant community composition and distribution over time via vegetation plots or transects, and/or aerial photography.

REFERENCES

- Agee, James K. 1993. Fire Ecology of Pacific Northwest Forests. Island Press, Washington, D.C.
- Chehalis Basin Partnership. 2004. Chehalis Basin Watershed Management Plan.
- Chehalis Basin Partnership, Habitat Work Group. 2008. The Chehalis Basin Salmon Habitat Restoration and Preservation Work Plan for WRIA 22 and 23.
- Davenport, Roberta. 2006. Control of knotweed and other invasive species. In Native Plants Journal Vol.7/No.1, pp 20-26.
- Envirovision Corporation. 2000. Chehalis Basin Level 1 Assessment, December 2000. Prepared for the Chehalis Basin Partnership, Grays Harbor County, WA. http://www.co.grays-harbor.wa.us/info/pub_svcs/ChehalisBasin/PhaseII/Index.html#Assessment
- NatureServe. 2003. A working classification of Terrestrial Ecological Systems in the Conterminous United States. International Terrestrial Ecological Systems Classification. NatureServe, Arlington, VA.
- WDNR, 2001. Aquatic Resources Policy Implementation Manual. Washington Department of Natural Resources, Aquatic Resources Division, Olympia, WA
- WDNR. 2007. State of Washington Natural Heritage Plan 2007. Washington Department of Natural Resources, Olympia, WA. http://www.dnr.wa.gov/ResearchScience/Topics/NaturalHeritage/Pages/amp_nh.aspx
- WNHP. 2008. Draft Field Guide to Washington's Ecological Systems. Compiled by Joe Rocchio and Rex Crawford. Washington Natural Heritage Program, Washington Department of Natural Resources, Olympia, WA. 240pp.

APPENDIX A. CRSP NAP WORKSHOP PARTICIPANTS

Name	Affiliation
H. Max Zahn	WDFW
Brian Blake	State Representative
Tony Wells	Eyes in the Woods
Ken Guza	Volunteer canoe steward
Reed Waite	WETA
Andy Mesojednik	Local businessman; Ducks Unlimited
Lonnie Crumley	Streamworks LLC
Pete Holm	ICG
Sarah Krueger	WETA
Lee Napier	Grays Harbor County
Phil Cook	Weyerhaeuser
Rob Radford	Local volunteer
Anne Radford	Local volunteer
Janet Strong	Chehalis River Land Trust, Audubon
Linda Kunze	Former Heritage scientist who proposed CRSP Natural Area; Currently with Nisqually Land Trust
Carol Seaman	Nearby landowner
Joann Yost	
Doug Fricke	
Lori Lennox	
Wally Vincent	
Steve Robecker	
Jay Sterling	
Dan Boeholt	
Jack Smith	WDFW
Casey Black	Port Blakely
Ron Schillinger	Mayor of Montesano
Dean Schwickerath	Gray's Harbor Audubon
Diane Schwickerath	Gray's Harbor Audubon

APPENDIX B. PARTIAL PLANT LIST

Common Name	Scientific Name
Trees and Shrubs	
Red alder	<i>Alnus rubra</i>
Red-osier dogwood	<i>Cornus sericea</i>
Scot's broom*	<i>Cytisus scoparius</i>
English ivy*	<i>Hedera helix</i>
English holly*	<i>Ilex aquifolium</i>
Indian plum	<i>Oemleria cerasiformis</i>
Sitka spruce	<i>Picea sitchensis</i>
Black cottonwood	<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>
Himalayan blackberry*	<i>Rubus discolor</i>
Salmonberry	<i>Rubus spectabilis</i>
Willow	<i>Salix</i> spp.
Red elderberry	<i>Sambucus racemosa</i>
Douglas' spirea	<i>Spirea douglasii</i>
Western red-cedar	<i>Thuja plicata</i>
Western hemlock	<i>Tsuga heterophylla</i>
Herbs	
Pacific silverweed	<i>Argentina egedii</i> ssp. <i>egedii</i>
Goatbeard	<i>Aruncus sylvestris</i>
Lady fern	<i>Athyrium filix-femina</i>
Deer fern	<i>Blechnum spicant</i>
Angled bittercress	<i>Cardamine angulata</i>
Lyngby's sedge	<i>Carex lyngbyei</i>
Slough sedge	<i>Carex obnupta</i>
Siberian miner's lettuce	<i>Claytonia sibirica</i>
Scouler's corydalis	<i>Corydalis scouleri</i>
Bed straw	<i>Galium</i> sp.
Cow parsnip	<i>Heracleum maximum</i>
Pacific waterleaf	<i>Hydrophyllum tenuipes</i>
Jewelweed	<i>Impatiens</i> sp.
Yellow iris*	<i>Iris pseudacorus</i>
Skunk cabbage	<i>Lysichiton americanum</i>
Purple loosestrife*	<i>Lythrum salicaria</i>
Mitrewort	<i>Mitella</i> sp.
Parrotfeather*	<i>Myriophyllum aquaticum</i>
Pacific water-parsley	<i>Oenanthe sarmentosa</i>
Sweet coltsfoot	<i>Petasites frigidus</i>
Reed canarygrass	<i>Phalaris arundinacea</i>
Bohemian knotweed*	<i>Polygonum bohemicum</i>
Sword fern	<i>Polystichum munitum</i>
Softstem bulrush	<i>Schoenoplectus tabernaemontani</i>
Small-fruited bulrush	<i>Scirpus microcarpus</i>
Piggyback plant	<i>Tolmiea menziesii</i>
Cattail	<i>Typha latifolia</i>
Stream violet	<i>Viola glabella</i>
* = Introduced	

APPENDIX C. BIRD SPECIES LIST

Preliminary Bird List for Chehalis River Surge Plain Natural Area Preserve

Birds seen at the CRSP August 8, 2000 (Pearson), on Blue Slough canoe loop and Preachers Slough Road walk on June 2, 1998, and brief visit April 25, 1998 (Chris Chappell and Amy Stock).

Probable Breeding Species
American Robin - many, singing
American/Northwestern Crow – many
Bald Eagle - 2, known to nest
Bank Swallow
Band-tailed Pigeon - several seen flying low in a number of locations, one seen foraging on fruiting shrubs
Belted Kingfisher – 2
Bewick's Wren - many, singing
Black-capped Chickadee – many
Black-headed Grosbeak - many, singing
Black-throated Gray Warbler - many, singing
Brown Creeper - few, singing, fledglings seen
Brown-headed Cowbird - few, singing
Bushtit – few
Caspian Tern
Cedar Waxwing – many
Chestnut-backed Chickadee – many
Common Nighthawk - 2 together, courtship displays
Common Yellowthroat - many, singing
Downy Woodpecker
European Starling - many, nest seen
Glaucous-winged Gull and Wester & Glaucous-winged Gull Hybrid
Golden-crowned Kinglet - several, singing
Hairy Woodpecker - 4, drumming heard
Hutton's Vireo - 2 singing
Killdeer
Mallard - 2
Marsh Wren - several, singing
Northern Flicker – several
Northern Rough-winged Swallow - few, nesting on adjacent bluffs, foraging over NAP
Orange-crowned Warbler - many, singing
Osprey - 1, known to nest
Pacific-slope Flycatcher - several singing
Pileated Woodpecker - heard calling and drumming on 25 Apr
Pine Siskin
Purple Finch - many, singing
Rufous Hummingbird - several, courtship displays
Song Sparrow - many, abundant
Spotted Sandpiper - 3, calling
Steller's Jay – many
Swainson's Thrush - many, abundant
Tree Swallow - several, nest seen
Warbling Vireo - few, singing

Western Gull
Western Sandpiper
Western Wood-Pewee - 7, more than I expected, in spruce swamp with open canopy
Willow Flycatcher - several, singing
Wilson's Warbler - many, singing
Winter Wren - many, singing
Wood Duck - few, one seen perched in spruce tree
Yellow Warbler - 4, 2 singing, 2 females, surprisingly few

Possible Breeding Species
American Goldfinch - few, flyovers
Common Merganser - 2 females seen
Common Snipe - 2 seen during May (date?) in potential breeding habitat, A. Stock
Dark-eyed Junco - 1 singing
Downy Woodpecker - 1 each on 25 Apr and 2 June
Great Blue Heron - few, flyovers
Red Crossbill - flock of several in spruce woodland
Red-breasted Nuthatch – 2 seen
Red-breasted Sapsucker - 1 seen
Red-tailed Hawk - one seen
Red-winged Blackbird - few singing 25 Apr, none in June!! surprising its not more common
Sharp-shinned Hawk - 1 adult seen
Vaux's Swift - 4, flying over short ways above treetops in spruce woodland, courtship call heard
Virginia Rail - 1, territorial calling on 25 Apr, just outside NAP boundary
Western Tanager - 2 singing
White-crowned Sparrow - 1 singing

Visitors or Migrants
Barn Swallow - 2 flyovers, perhaps foraging
Canada Goose - heard June
Common Raven - 1 flyover
Evening Grosbeak - several flyovers
Ruby-crowned Kinglet - few on 25 Apr
Townsend's Warbler - few on 25 April
Turkey Vulture - 2 flyovers
Varied Thrush - few on 25 Apr
Yellow-rumped Warbler - several on 25 April

Additional Notes:

We played a tape of Yellow-billed Cuckoo many times and had no responses, though it was effective in exciting *other* bird species.

Band-tailed Pigeons are probably most attracted to this site by the great abundance of fruiting shrubs, especially salmonberry, red-osier dogwood, black twinberry, to a lesser degree, cascara. Of these only cascara has been reported in the literature as a major food, but this could be due to a lack of adequate sampling.

The paucity of Yellow Warblers was amazing considering the willow thicket habitats (both tall and short) that we surveyed. Perhaps they are naturally low in abundance in the Sitka spruce zone even in apparently suitable habitat. The breeding bird atlas shows them as absent from large areas of that zone, including the CRSP NAP.

Also saw 4 river otter, saw and heard several Douglas squirrels, saw a lone varying hare, saw 2 harbor seals.

APPENDIX D. POLICY MANUAL

Department of Natural Resources

Cancels: PO13 - 001 Natural Area Preserve Public Use dated April 28, 1997

PO13-002 NATURAL AREA PRESERVE PUBLIC ACCESS

Discussion

The Washington State Legislature established a system of natural area preserves (NAPs) to preserve and protect the natural heritage of the state.

“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....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.” (RCW 79.70.010)

Preserves are identified through an organized scientific inventory process that is guided by the State of Washington Natural Heritage Plan. The purpose of NAPs is:

- 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 preserving natural features of scientific or educational value.

NAPs, due to their statewide ecological significance and rarity, are a very select subset of all the lands managed by the department and have high value for scientific and educational purposes. These lands are not easily replaceable with other lands if damaged.

Some NAPs are not appropriate for public access due to highly sensitive natural features or limited opportunities for locating public use that would not degrade the ecological values or features of the site. However, on a case-by-case basis, low levels of public access outside of environmentally sensitive areas may be approved on some NAPs when consistent with the conservation, research, and education goals of those NAPs.

While the purposes of NAPs require public use to be strictly managed, other public lands of the state, such as state parks or wildlife areas, have been established for broader public and recreational uses. Department-managed trust lands also provide for multiple uses.

Natural Resources Conservation Areas managed by the department provide additional opportunities for low-impact public use, while also protecting outstanding ecological and scenic values.

The department manages NAPs through the Natural Areas Program, in coordination with the Natural Heritage Program and the Washington State Natural Heritage Advisory Council.

Policy

It is the policy of the department to prepare a site-specific management plan for each NAP. Such plans will be developed utilizing the best available science and will give top priority to protecting the natural features that led to the designation of each site as an NAP and to maintaining natural processes.

Management plans will be developed in consultation with other appropriate Department of Natural Resources divisions and programs, state and federal agencies, area local governments, interested local tribes, and the public.

Among other issues, the management plans will specify what public access is allowed, where access will occur, and how it will be managed and monitored, using the following guidelines⁵.

Public use on NAPs will be limited to:

- Authorized non-consumptive uses that focus on scientific study or educational purposes,
- Appropriate location, intensity, timing, and type of low-impact access outside of environmentally sensitive areas, when determined by the department through case-by-case analysis of each NAP to be consistent with conservation management and the primary purposes of research and education, or
- Traditional established aboriginal rights, or rights recognized by treaties or applicable court rulings.

Determination of public access and uses generally will occur within the management planning process. Baseline ecological data will be required to make a determination about public access opportunities. Efforts will be made to monitor the effects of any approved public access and practice adaptive management to eliminate unacceptable impacts.

Recognizing that resource limitations may not allow management planning to occur soon for each NAP, the department retains the authority to manage NAPs

5 RCW 79.70.030(1)(b): "The plan must identify the significant resources to be conserved consistent with the purposes of this chapter and identify the areas with potential for low-impact public and environmental educational uses. The plan must specify the types of management activities and public uses that are permitted, consistent with the purposes of this chapter. The department must make the plans available for review and comment by the public, and state, tribal, and local agencies, prior to final approval."

outside of the management planning process. As needed, the department may analyze and address specific management issues to assure protection of the natural features for which an NAP was designated until such time as resources are available to develop and properly implement a management plan.

The department may authorize land access for consumptive uses (such as hunting, fishing, trapping, or plant harvesting) only when:

- Determined by the department to be the most appropriate management tool to protect the natural features for which a preserve was designated, or
- Determined by the department, in consultation with the Washington Department of Fish and Wildlife, to be the most appropriate fish or wildlife management tool, or
- Determined by the department to increase an NAP's scientific or educational value when consistent with conservation management and non-degrading to the natural features for which the NAP was designated, or
- Determined by the department, for a specific circumstance, to be consistent with conservation management and the primary purposes of research and education, occurring outside of environmentally sensitive areas, and of appropriate location, intensity, and timing.

Where management actions impact fish or wildlife resources, or existing access for fishing or hunting, the department will consult with the Washington Department of Fish and Wildlife prior to determining a course of action in recognition of overlapping administrative authorities for conservation, habitat, and species management. The department may limit access to a preserve until resources are available to develop and properly implement a management plan or to analyze specific access requests. The department will seek resources to accomplish these tasks and provide access to NAPs for scientific and educational purposes, and for low-impact public uses outside of environmentally sensitive areas as determined on a case-by-case basis per Chapter 79.70 RCW and this policy. Completion of management planning and other site-specific analyses will be prioritized to address NAPs within each department region that have a high need for resource protection, ecological restoration, or public use management.

Implementation

The division responsible for NAPs will provide program guidance to the regions to implement this policy. The division will also provide scientific assistance for ecological inventories, data and trend analysis, and management activities. The regions will develop site management plans using the guidelines developed by the division. If the region lacks staff or expertise to develop site plans assistance will be provided by the division. Management plans, public access issues analyzed and addressed outside of the management planning process, and consumptive uses on NAPs, other than emergency measures necessary to

protect public resources, will be approved by the Natural Heritage Advisory Council and the region and division managers responsible for the NAP.

Policy and Administration

SEE ALSO

Chapter 79.70 RCW - Natural Area Preserves Act

Chapter 79.71 RCW - Natural Resources Conservation Areas Act

State of Washington Natural Heritage Plan

APPENDIX E. FIRE MANAGEMENT STRATEGY

Management Jurisdiction

Fire suppression on the NAP 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 Grays Harbor Counties where the NAP is located.

Ignition Sources

Potential ignition sources include: cigarettes thrown from vehicles or by site visitors, parked vehicles, fireworks and lightning.

Preferred Suppression Tactics

"Light on the Land" fire techniques should be employed whenever possible, with specific guidelines listed below. Sensitive areas identified on maps should be avoided whenever possible, particularly for use of retardants or heavy equipment. These sensitive areas are primarily located along the shoreline of the river and sloughs. The following are preferred fire suppression tactics:

When safe and reasonable, use natural fuel breaks or control lines outside the NAP 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.

Helicopter landing areas and fire camps should not be established within the NAP.

Under extreme conditions or when an improved structure is threatened, foam or retardants are preferable to bulldozers. It is preferable not to use foam or retardants on the salt marsh because of negative effects to the aquatic community and fertilizing effects to the plant community.

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 and extent of mop-up, and type of mop up activity will be determined by the Incident Commander in consultation with Natural Areas staff. Mop-up activities should be minimized in the sensitive areas identified on maps and soil disturbance minimized by using water as much as possible.

After fires have been suppressed, site restoration will be supervised by the region Natural Areas Manager in consultation with the west side Natural Areas Ecologist.

Site Representatives

If wildfire involves or threatens the NAP, one of the following DNR personnel shall be contacted and placed as a consultant to the Fire Incident, using the closest available person first:

Natural Areas Manager
Pacific Cascade Region
360-577-2025 work center 360-596-5144

Natural Areas Ecologist
Asset Management and Protection Division
(360) 902-1600

If the incident occurs after normal working hours, contact emergency services #911. Emergency services will contact the DNR Pacific Cascade Region standby staff, who will then contact a Natural Areas representative from the above list at home.

The representative will inform the Incident Commander of:

1. The purpose of the NAP;
2. The management objectives for the primary features of the NAP; and
3. The need to employ "Light on the Land" fire suppression techniques when possible. The Incident Commander should contact the Region representative or the Division before beginning mop-up activities within the NAP.

Post-Fire Rehabilitation

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 species native to the site) 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. (See restoration guidelines in Appendix F.) If revegetation is deemed necessary, the Natural Areas Ecologist will develop a plan, and any restoration costs above and beyond erosion control measures typically implemented by Fire Control will be the responsibility of the Natural Areas Program.

APPENDIX F. PLANT SPECIES RESTORATION AND INTRODUCTION / REINTRODUCTION

Restoration activities are carried out to implement site recovery where no action would threaten the continued existence or condition of the primary features that the conservation area was intended to protect.

Several restoration projects have been completed on the CRSP NAP. The most significant project is the restoration of a large area along Preachers Slough dominated by Bohemian knotweed, reed canary grass, blackberry, and scotch broom. These species were controlled and a full complement of native species replanted in a phased project lasting seven years. A paper reporting the project was published in the Native Plant Journal. Funding for this work was provided by The Nature Conservancy and the US Fish and Wildlife Service - Chehalis Fisheries Restoration Program.

Any ecological restoration activity should consider the following:

- When possible, use plants and seeds from adjacent sites.
- Plant species selected should mimic natural plant communities, or at least an appropriate seral stage of these communities.
- When purchasing “native” species, attempt to locate material originating from local stock (within approx. 30 miles), from similar climate and topographic conditions. If such stock cannot be located, use material that originated from the same ecoregion and is the same variety as that found on the site.
- Do not use invasive native species that are likely to have a negative impact on adjacent native vegetation.
- Do not use “native species” that are not native to the site.
- Use soils from adjacent sites. When soils are imported, it is critical that they are sterilized to minimize the potential import of exotic weed species.

For larger restoration projects, a detailed restoration plan should be developed identifying the purpose and objectives, methods, and monitoring.

APPENDIX G: PUBLIC PARTICIPATION MEETING NOTES

PUBLIC MEETING NOVEMBER 15, 2007, and Feb 20, 2008, Summary

The group discussed a need to maintain the current and historic access of the Chehalis River Surge Plain. Many participants focused on hunting and fishing access; some for and others against.

Stakeholders would like to see the Chehalis River Surge Plain NAP continue its efforts of protecting fish, wildlife and plants in conjunction with removal of noxious weeds and invasive species. They see the value in maintaining and restoring the ecosystem of the area. Pollution and littering problems on Preachers Slough Road and other areas on the preserve are major concerns. Areas of possible conflict exist. Hunting, which is historic to the area, is a concern to walkers. Land acquisition will prevent new construction in and near the preserve and allow for a more extensive trail system.

Floodplain Values:

The meetings, held shortly after the flooding to nearby areas, contributed to community awareness that the Chehalis River Surge Plain helps to protect the area from severe flooding. They discussed the benefit the preserve offers for flood control and that in order for the surge plain to work the way it does, the area must remain natural.

Volunteers:

The Department of Natural Resources should establish a volunteer group to help them with management tasks. Volunteers can help clean up and remove trash, remove invasive species, and report inappropriate usage, among other tasks. The volunteers can include people who regularly use the walking trails, nearby neighbors, hunters, fishers, and bird watchers. Essentially, stakeholders would like to form a CRSP NAP Support Group.

The group addressed their concern about the lack of long term funding. They are concerned that DNR won't be able to maintain existing structures and keep up with other maintenance.

Preachers Slough Road:

Stakeholders want to see Preachers Slough Road improved for vehicle access. They would like to replace or repair the culvert for water-flow and fish passage. DNR should remove the blocking fill and put in a bridge. A gate would allow for day use only. Several stakeholders want an improved gravel parking lot in the area near the river. Alternatively, stakeholders suggested replacing the road with a path. This would provide for walk-in access only with parking above, eliminating vehicle access altogether.

DNR and Grays Harbor County currently own separate sections of Preachers Slough Road. Ideally, one of the two will vacate the road allowing the other to take full management responsibilities.

Hunting & Fishing:

A strong percentage of stakeholders want to maintain the historic hunting access; an equally strong percentage want to prohibit hunting. Some compromises discussed were: Allow upland hunting; create firearms restriction zones; restrict hunting near areas of high use; encourage self management and education for hunters; designate hunting to species hunted with seasonal firearm restrictions (*i.e.*, deer hunting allowed for a shorter season.)

Derelict gear in and around the preserve should be removed. There is a need for improved parking, and more access points for fishers. Stakeholders want to discourage trampling of natural vegetation. They suggested putting in pathways for fishers. Hunting and fishing groups should volunteer to maintain the areas they use.

Trails & Water Access:

Major requests for access include: extend the trails (purchase land where necessary); improve canoe and kayak access; improve parking and create more access points.

The group made specific trail requests, including a small trail along the riverbank from Preachers Slough parking to the bank fishing areas and riverbank, the replacement of Preachers Slough Road with a trail, a trailhead and parking at Blue Slough Road, trails connecting lands to the east and west, trails on Katon Road and Central Park Drive, and interpretive trails with signage.

With creating better access, the hope is that pedestrians will use trails and stay off vegetation. DNR, with the help of volunteers, should continue its efforts to remove invasive species.

Education / Public Information:

The community sees real value in educational opportunities at the preserve. It would be beneficial to increase the educational opportunities, particularly addressing the function of a surge plain. The educational opportunities at the preserve would be not only for local school environmental education, but also for preserve users. DNR should integrate with Grays Harbor Seaport Tall Ships and use that forum to talk to the public about the surge plain.

DNR can develop a CRSP NAP website, which would include information about the preserve, ecological values of the surge plain and its value to fish and wildlife, stewardship possibilities, and conservation efforts. Teachers around the state could incorporate the surge plain into lesson plans using both handouts and information from the website.

Stakeholders came up with an idea for an annual tour or Appreciation Day. The appreciation day would be an event that spotlights volunteer projects, raises public awareness, involves press and offers an ecological tour with bird watching.

Signage within the preserve can be used for many purposes. For instance, a bulletin board could provide a map with information on water trails and access points. The bulletin board could be useful in educating the public about proper use of the site in an effort to promote ethical behavior such as removing trash and gear. Stakeholders suggested that signage be bilingual.

Safety:

The group discussed the major safety issues at the CRSP NAP such as dumping, illicit drug use and manufacture, tidal awareness, and people driving off-road. Stakeholders want more enforcement in the area. They suggested that DNR partner with local law enforcement and WDFW. Local citizens and users should be encouraged to report illicit activity. DNR or stewards should gate and close the road at night.

Warn users about hunting activity as well as tides, currents, and winds. There should also be information about large woody debris in the water and muddy beaches at low tide. Post notices on a bulletin board along with a list of emergency contact numbers. A rescue / response action plan should be in place. Improve parking areas with good signage and shoulder turn-offs.

Stakeholders would like to see the creosote covered pilings and other hazardous materials removed.

PUBLIC MEETING TO REVIEW PLAN, DECEMBER 1, 2008

Seven members of the public attended; all have previously come to a planning workshop and are included in the prior attendee list. E-mailed and verbal comments were also received. Summarized comments on the draft management plan follow.

Access:

Public access to the northern areas of the CRSP preserve – north of the river – is desirable. A bicycle path is possible on the old highway on the north side; there is a remnant of a historic highway within the NW part of the site that could be used. Propose an ADA accessible trailhead to the old homestead area (Preachers Slough Road / Pinnick's Bar.) Make sure to address ADA access. Support opportunities and activities to get people active and outdoors.

Keep boat launch areas non-motorized within NAP. Friends Landing is available, close by, for motorized boats. Consider offering tour boats as opportunity for public to appreciate area

Site and Wildlife Protection:

Be careful with the approach of inviting public to access area – concern for area being “loved to death.” There are potential impacts to wildlife from too much use.

Wildlife can be enjoyed from the NAP perimeter. Garbage dumping along the old highway on the north side is an issue; when water levels rise, trash floats away and into the river and the surge plain.

Planning and partnerships:

Need Grays Harbor County plan that meshes with DNR/NAP plan for the area between Montesano and Aberdeen. Clarify current status and long-term plan for Preachers Slough Road. Partnerships are needed with State / County / Agencies. Is there a Growth Management Plan? Conflict is apparent between the goal of ecological protection and encouraging public use. Are priorities (for management actions) identified in the plan? Identify benefits for landowners to keep their ownership within the NAP boundary.

Education and Outreach:

The NAP is an opportunity to partner with Tribes to interpret Native American culture and for outreach and education related to this. The site is also an opportunity to provide information on Montesano / Grays Harbor heritage to inform and educate young people.

Hunting Related Issues:

It was pointed out that navigable waters are not part of the preserve and thus hunting waterfowl using boats must still be allowed, according to WDFW hunting rules. There is no reason to allow hunting on the lands and small watercourses within the preserve. Bears and other species native to the lands in the preserve serve functions in protecting the natural values, features and integrity of the preserve. If we are determined to protect the native plants, then why does the plan not protect the native wildlife?

Hunting is NOT a low-impact form of recreation and should not be allowed in the plan. Some hunters are quite disruptive of the areas in which they hunt.

There are careful hunters respectful of the environment, but they still may wound or kill large animals that have a large role in the character of the preserve. Keeping access points by land limited to those existing currently does somewhat limit hunting, as does disallowing hunting anywhere near trails, parking spots and overlooks. These restrictions don't protect wildlife in the majority of the preserve.

The vast majority of private and public lands in Washington are open to hunting. Wildlife, especially bears, need somewhere where they will not be harassed, wounded or killed. Hunting should not be permitted on Natural Area Preserves, while hunting should be allowed in other more suitable areas.

Statewide NAP public access policy should be clear regarding hunting, as it appears that recreational hunting is not allowed.

APPENDIX H: WEED MANAGEMENT PLAN

WEED MANAGEMENT PLAN

FOR

**Chehalis River Surge Plain Natural Area Preserve
Grays Harbor County, Washington**

2008-2010

Prepared By: Natural Areas Program
Washington Department of Natural Resources

Plan template developed by The Nature Conservancy

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1. INTRODUCTION

A. Preserve description

Chehalis River Surge Plain (CRSP) Natural Area Preserve (NAP) is located on the Chehalis River between Montesano and Cosmopolis in Grays Harbor County, Washington. The site is part of the statewide system of natural areas established and maintained by the Department of Natural Resources (DNR).

DNR's Natural Area Preserves are managed to protect the ecological features for which the site was designated, to restore native ecosystems, and for scientific and educational use. The primary management objective for the Chehalis River Surge Plain NAP is to protect this high-quality surge plain wetland by promoting structural and wildlife diversity within the wetland forest and other wetland communities. This goal is achieved through protection and preservation of natural ecological and physical processes, while controlling factors that directly or indirectly modify them.

B. Weed species descriptions and impacts

For the purposes of this plan, weeds include plant species that are not native to the site or local area and that are considered to be a threat to site management goals. Weeds are one of the greatest threats to the quality and diversity of the surge plain wetland. They can displace the native plants that provide food and shelter for native animals, and can also alter the character of habitats by changing important processes like nutrient flow, flooding, etc. For these reasons, weed control is a very high priority for management of the Chehalis River Surge Plain NAP.

Because of their impact on the surge plain wetland, which is the primary ecological feature of the site, aquatic and riparian weeds are a top priority for control. Aquatic species of concern include: Bohemian Knotweed (*Polygonum x. bohemicum*), Purple loosestrife (*Lythrum salicaria*), Yellow Iris (*Iris Pseudacorus*), and Parrotfeather (*Myriophyllum aquaticum*). Upland invasive species found on the preserve include English ivy (*Hedera helix*), and Himalayan blackberry (*Rubus discolor*).

Wetland species

Bohemian knotweed (*Polygonum x. bohemicum*) Class B Noxious Weed

Bohemian knotweed, a hybrid of Giant knotweed and Japanese knotweed, was originally introduced from Asia as an ornamental. It has escaped to roadsides, waste areas, ditch banks, and pastures throughout western Washington.

This species is a very aggressive invader. Knotweed can spread rapidly due to its ability to reproduce vegetatively. Root and stem fragments, as small as 1/2" (1 cm) can form new plant colonies. Seasonal high water events and floods sweep plants into rivers and creeks, then fragment and disperse knotweed plant parts throughout the floodplains and cobble bars. The fast growing knotweed then takes advantage of the freshly disturbed soil to become established. Because it grows faster than most other plant species (including native species and most other weeds) it quickly outgrows and suppresses or kills them.

Other knotweeds are also present in the Chehalis River Basin: Himalayan, giant and Japanese. These species have the potential to colonize the NAP, especially given reoccurring flood events.

Purple loosestrife (*Lythrum salicaria*) Class B Designate Noxious Weed

Purple loosestrife is native to Eurasia, and is found in wetlands such as cattail marshes, sedge meadows, and open bogs. It also occurs along stream and river banks, lake shores, ditches and other disturbed wet soil areas. Expansion in a wetland can be extensive and sudden due to the abundance of seeds produced and the rapid growth of seedlings. High seed viability and prolific seed production can build up a seed bank of massive proportions.

Purple loosestrife seed germinates in such high densities that it outcompetes native seedlings. The buildup of debris around the roots enable loosestrife to invade deeper water and to form dense stands that shade out other emergents and push out floating vegetation by closing open water spaces. Wetland communities can be transformed to a loosestrife dominated monoculture over a short period of time. Habitat loss occurs when native and beneficial plants that provide food, nesting material and shelter for local wildlife and water fowl are replaced by non-native plants that do not provide these essential functions.

Purple loosestrife poses a significant threat to the Chehalis River riparian communities, and has spread prolifically in recent years in the Chehalis River Basin. Loosestrife appears to be tolerant of some salinity and grows in a wide range of inundation regimes, making the lower Chehalis River and Chehalis River surge plain especially vulnerable to invasion and establishment by this species. Large established populations of purple loosestrife already exist in the lower Chehalis River. At Friends Landing, near Montesano, purple loosestrife choked off waterways, resulting in a loss of recreational opportunities.

Yellow Iris (*Iris pseudacorus*) Class C Noxious Weed

Yellow iris is a hardy, herbaceous perennial wetland plant that has been widely planted around the world as a showy garden or pond ornamental plant (Ramey 2001). Yellow iris is native to the British Isles and Europe, and was brought to the US in the early 1900's. It is found in marshy wet areas, such as wetlands, streambanks, and salt marshes, where it can colonize large areas, forming very dense, thick mats of rhizomes in monotypic stands, outcompeting native vegetation.

In natural wetland areas such as the CRSP, these colonies can invade and dominate a variety of vegetation types, displacing native plant and animal diversity, and altering successional trajectories. Once established, its thick tuberous rhizomes can tolerate both prolonged anoxic and/or drought conditions, and its rhizomes and floating seeds can be transported downstream for further spread. The rhizome mat can prevent the germination and seedling growth of other plant species. The mat also creates improved habitat for *I. pseudacorus* by compacting soil and elevating the topography, therefore creating a habitat that is drier and with increased rates of siltation and sedimentation.

Parrotfeather (*Myriophyllum aquaticum*) Class B Designate Noxious Weed

Parrotfeather is a milfoil species native to the Amazon River in South America. This attractive plant is easy to cultivate, and it has been introduced worldwide for use in indoor and outdoor aquaria. It is a popular aquatic garden plant. Parrotfeather is found in freshwater lakes, ponds, streams and canals, and appears to be adapted to high nutrient environments. It tends to colonize slow moving or still water. While it grows best when rooted in shallow water, it has been known to occur as a floating plant in the deep water of nutrient-enriched

lakes. The emergent stems can survive on wet bank of rivers and lakes shores, so it is well adapted to moderate water level fluctuations.

Parrotfeather threatens the emergent and aquatic ecosystems of the Chehalis River. It threatens habitat for fish and other aquatic organisms because it changes the physical and chemical characteristics of lakes and streams. It lowers pH and decreases available oxygen, which limits many species. Parrotfeather provides mosquito larvae habitat. It forms floating mats that transform mudflats, sloughs and bars into shallow, weed-choked areas. These mats choke sloughs and backwaters, reducing fish passage and water movement. Plant fragments are easily spread and could colonize the majority of this river system if action is not taken.

Parrotfeather is a State Department of Agriculture (WSDA) quarantine species, and it is illegal to buy, sell or offer this plant for sale in Washington.

Upland Species

English Ivy (*Hedera helix*) Class C Noxious Weed

English ivy belongs to the family Araliaceae (ginseng) and is a native of Europe. Brought to North America by colonial settlers, it has become naturalized in the US. English ivy is cultivated in Europe and North America in gardens, landscapes and as house plants. This plant grows easily in many types of soil and in sun or shade, and is fairly drought tolerant once it is established. English ivy outcompetes both grasses, herbs and trees, often reducing animal feeding habitats. It frequently climbs into the tree canopy, smothering the tree's leaves and eventually causing its death. In warmer areas such as southwest Washington, ivy can grow throughout the year and out-compete native vegetation that is dormant during the winter. Seeds are often spread into undisturbed areas by birds or other animals. Four ivy cultivars are designated as Class C noxious weeds in Grays Harbor County.

Himalayan blackberry (*Rubus discolor*) Proposed Class C Noxious Weed for 2009

Himalayan blackberry is a native of western Europe, and was probably first introduced to North America in 1885 as a cultivated crop. By 1945, Himalayan blackberry had become naturalized along the West Coast. It occurs mainly in areas with an average annual rainfall greater than 76 cm, at altitudes up to 1800 m, and on both acidic and alkaline soils. It forms impenetrable thickets in wastelands, pastures, and forest plantations and grows along roadsides, creek gullies, river flats, fence lines, and right-of-way corridors. Himalayan blackberry tends to prefer wet sites even in relatively wet climates, and thus is of special concern in the CRSP.

Himalayan blackberry colonizes areas initially disturbed and then neglected by humans. It is a perennial weed which is difficult to control due to its ability to regenerate from sections of root stock. The production of dense thickets, especially in wet areas, may hinder medium- to large-sized mammals in gaining access to water. Himalayan blackberry is very widespread in our area, and can displace native plant species. Its seeds are widely dispersed by berry-eating birds.

Other Weeds of Concern

Scot's broom (*Cytisus scoparius*) Class B Noxious Weed

Native to Britain and central & northern Europe, Scot's Broom became naturalized by the early 1900's due to mild climate, lack of invertebrate predators, production of long lasting seeds, and ability to fix nitrogen, and tolerance of many soil conditions. It is widespread throughout the western portion of the Pacific Northwest from British Columbia to California. In the Pacific Northwest, broom has been widely used for landscaping, and has been planted along roads and waterways to help prevent erosion. Broom's ability to fix nitrogen alters soil chemistry and effectively displaces native species. Basal resprouting can reduce the effectiveness of both mechanical and prescribed fire control treatments. Resprouting is most pronounced in young plants and in spring. Its aggressive spread and establishment away from planted areas into stands of native vegetation causes it to be of serious concern.

Reed canary grass (*Phalaris arundinacea*) Class C Noxious Weed

Reed canarygrass (RCG) is an exotic species introduced throughout western Washington for soil stabilization purposes. Reed canarygrass aggressively invades riparian and wetland areas, including roadside ditches, overtaking native vegetation and creating monotypic stands from dense mats of rhizomes.

RCG prefers seasonally or continually wet habitats and does not survive in dry uplands, but can tolerate prolonged periods of drought. RCG can reproduce vegetatively by its rhizomes and rhizome fragments, as well as sexually by its abundantly produced seed. RCG rhizomes and dead stems and leaves can form a sod layer measuring over 0.5 meters thick. A few native plants may be able to survive within RCG infestations, but wetlands without RCG tend to have a much higher diversity of native species. These large plants can effectively compete and exclude almost all native plant species, provide little food for desirable wildlife, and will perpetuate themselves for many years.

English Holly (*Ilex aquifolium*)

Holly is a robust evergreen shrub to small tree. This European native is shade-tolerant and invades woodlands in our area. Holly trees prefer moist, nutrient-rich soil, and can be found in plains, mountain areas, and temperate forests. Once pollinated, bright red berries appear during the winter. These berries contain seeds which are spread by birds. Holly can dominate the tall native shrub layers in the forest, creating a deep shade which prevents native species from growing and germinating. Holly not only grows from seed, but also by suckering and layering. Dense thickets can also form, creating a barrier and hazard for animals.

Brazilian elodea (*Egeria densa*) Class B Noxious Weed

Brazilian elodea is a submersed, freshwater perennial herb, generally rooted on the bottom in depths of up to 20 feet. This species is native to South America and was first reported in the United States in New York, in 1893. It is found in both still and flowing waters, in lakes, ponds, pools, ditches, and quiet streams. It tends to form dense monospecific stands that can cover hundreds of acres and can persist until senescence in the fall.

Brazilian elodea can restrict water movement, trap sediment, and cause fluctuations in water quality. In its home range, Brazilian elodea prefers cool (16-18°C), slow moving, shallow waters that are somewhat acidic and enriched. These conditions are very similar to those found in the Chehalis River.

C. Weed species distribution within the NAP

1. Bohemian knotweed

In the preserve vicinity, knotweed occurs in roadside ditches along Highway 107 and Blue Slough roads, and on adjacent private lands. Before restoration, it occurred along the banks of Preacher Slough on the edges of abandoned pastureland within the preserve boundary. Isolated patches remain in this area, as well as along the interpretive trail. All patches found in 2008 were treated with herbicide. Since it occurs in the Chehalis River basin upstream from the preserve, there is a strong likelihood that it will be brought into the preserve by floodwaters, necessitating careful monitoring.

2. Purple loosestrife

Purple loosestrife within and near the preserve has been surveyed annually since 1997. Loosestrife occurs along the waterways of Preacher and Blue Sloughs, as well as the Chehalis River in isolated patches. Many individual plants have been pulled from the major sloughs and small channels. The only large patches found within the preserve have been along the mainstem of the Chehalis River, and near the mouth of the Wynoochee River. Large infestations were also found along Highway 12 adjacent to the northern border of the preserve.

3. Yellow Iris

Yellow Iris grows in isolated clumps along the banks of Preachers, Blue and Peels Sloughs, as well as on the Chehalis River. Most of these patches are less than a square meter in size.

4. Parrotfeather

Parrotfeather has been found growing in two adjacent locations in Preacher Slough; the location is under the surface of the water at high tide. This very small patch has been found and controlled (pulled) in the past.

5. English Ivy

Ivy is found in large patches in the understory and climbing into the tree canopy along the banks of the Chehalis River, Preachers and Blue Sloughs in the NAP. It also occurs along Blue Slough road, where it is climbing into the tree canopy after being cut back.

6. Himalayan Blackberry

Blackberry can be found in many medium-sized patches along the length of the interpretive trail, and in other disturbed sites in the NAP.

7. Scot's Broom

Scot's broom was present in the old restoration area, and is present in the vicinity.

8. Reed Canary Grass

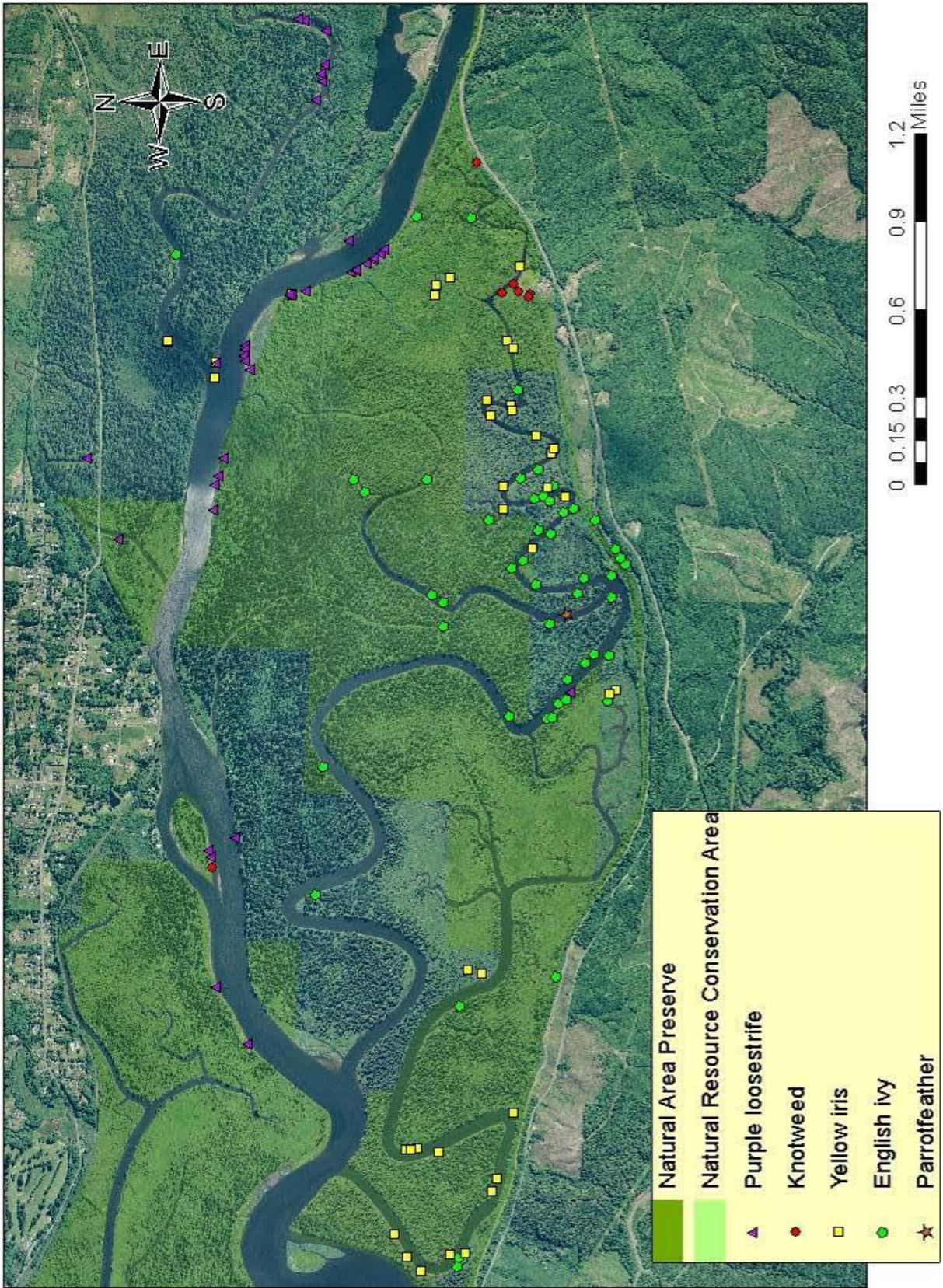
Extremely widespread in monotypic stands in the preserve, RCG is often the dominant species in emergent wetland areas.

9. English holly

Scattered in forested areas of the preserve.

10. Brazilian Elodea

Not currently present in NAP, however, it occurs upstream in the Wynoochee River and would be a concern if it appears in the preserve.



Map: Weed species distribution with the CRSP NAP

2. WEED MANAGEMENT PLANNING

A. General Management Philosophy

Weed control is part of the overall site management and restoration program. We focus on the species and communities we want in place of the weed species, rather than on simply eliminating weeds. We will implement preventative programs to keep the site free of species that are not yet established there but which are known to be pests elsewhere in the region. We will set priorities for the control or elimination of weeds that have already established on the site, according to their actual and potential impacts on native species and communities, particularly on our conservation targets. We will take action only when careful consideration indicates leaving the weed unchecked will result in more damage than controlling it with available methods.

We use an adaptive management strategy: first, we develop management goals for the site. Second, we identify weed species that inhibit us from reaching these goals and assign them priorities based on the severity of their impacts to conservation targets. Third, we consider methods for controlling them or otherwise diminishing their impacts and, if necessary, re-order priorities based on likely impacts of these control methods on target and non-target species. Fourth, we develop weed control plans based on this information. Fifth, the plan is implemented, and results of our management actions monitored. Sixth, we evaluate the effectiveness of our methods in light of the site goals, and use this information to modify and improve the goals, control priorities, methods and plans.

B. Management Priorities

We set priorities within the Natural Areas program in order to focus our statewide weed control efforts on those species that present the most significant threat to our conservation targets and to most efficiently use time and resources in the long-term. Therefore, we attempt to prevent new infestations and assign highest priority to existing infestations that are the fastest growing, most disruptive, and affect the most highly valued area(s) of the site. We also consider the difficulty of control, giving higher priority to infestations we think we are most likely to control with available technology and resources. Management priorities for weeds are based on the following factors:

- Current extent of the population in relation to its potential extent (recent small invasions are generally higher priority than more widespread invasions)
- Invasiveness (species most capable of invading undisturbed habitats are highest priority)
- Value of habitats invaded (weeds that invade habitats that support the NAP's primary features are highest priority)
- Predicted impact to the habitat (weeds that dramatically alter structure, composition, or function of the habitat are highest priority)
- Feasibility of control (all other things being equal, weeds that are

relatively easy to control are higher priority than species that will require major amounts of resources to control).

- Status of the species according to the state and county noxious weed control boards (control is required for A-listed and B-designate species)

1. Bohemian knotweed

Knotweed populations in the NAP have been largely brought under control in the past. However, the potential of this species to reestablish by sprouting from old roots, spreading from adjacent private property, or from fragments of upstream populations is very high. As such, current patches of knotweed should be aggressively treated within the preserve, and these and other potential infestation areas carefully monitored to prevent re-establishment. This species has a high priority for control due to its highly invasive nature and its great effects on the wetland and riparian features at the CRSP.

2. Purple loosestrife

Compared to other riparian ecosystems, current populations of loosestrife on the NAP are small. Because both the invasiveness of this species and effects on the primary ecological feature at CRSP are high, controlling purple loosestrife on the preserve is a high priority. Due to the small size of the population, eradication from the NAP is possible and should be pursued.

3. Yellow Iris

Iris is a high-priority species for control due to its high invasiveness and its ability to drastically alter the wetland habitat of the NAP. Treatment methods will be determined by information gathered from other land managers and from the results of trials conducted in the preserve this past season. If herbicide treatments prove effective, current populations should be treated intensively with the goal of eradicating iris from the NAP. Currently, the infested area in the preserve is very small, and, if herbicide treatments prove effective, a high level of control will be attainable.

4. Parrotfeather

Only one occurrence has been documented within the NAP, and it has likely been eradicated. However, due to its highly invasive nature, ability to alter the sloughs and other waterways in the preserve, and the large infestations present in nearby waterways, parrotfeather is a looming threat to the NAP. Monitoring of the preserve, especially the former infestation site should continue, and if found, the plants should be pulled, along with as much root material as possible.

5. English Ivy

More aggressive treatment of English Ivy is necessary in the NAP. Because of ivy's ability to kill trees by overtopping and shading them out, it presents a looming threat to the spruce wetland ecosystem. It cannot be removed completely from the preserve, but it can be controlled by preventing fruit production, which mainly occurs when it reaches the upper levels of the canopy. This species is a

medium-level priority for treatment, due to the difficulty of monitoring and treating populations.

6. Himalayan Blackberry

Blackberry occurs in sporadic patches within the NAP, mostly in disturbed areas such as the sides of roads and trails. As such, it does not pose a high threat to the preserves ecological function or native species populations. However, it does occur in some past and proposed restoration areas where it poses a threat to native plant establishment; in these areas, control is a high priority.

7. Scot's Broom

This species does not typically invade in wet or shaded areas, therefore it does not pose a threat to the primary ecological features of the preserve. It should be monitored to prevent major infestations, especially in restoration areas.

8. Reed Canarygrass

Due to its aggressive nature and its ability to form dense monocultures, Reed canarygrass poses a threat to the native wetland species of the surge plain. However, it is so widespread in the preserve that it is not practical to attempt a control program. This gives it a low priority for treatment. In areas where it has formed a monoculture, it is possible to plan localized control treatments and follow with restoration with native species that will competitively shade it out. In these restoration areas, it should therefore receive a higher priority for treatment than elsewhere on the preserve.

C. Objectives

1. Eradicate Bohemian knotweed from the preserve within five years
2. Reduce purple loosestrife by 80 percent within five years
3. Assuming yellow iris treatment is effective; reduce it by 80 percent within five years
3. Eradicate known parrotfeather population if it reappears
4. Control ivy, blackberry and Scot's broom where feasible, especially where they are impacting sensitive ecological features and restoration sites.

D. Past control efforts

The size of the Bohemian knotweed population has been seriously diminished by past control efforts; focusing mainly on restoration sites. Over six acres of knotweed were treated using herbicides (glyphosate and imazapyr); these areas were then replanted to native species. While the bulk of the infestation was removed, isolated re-sprouting is occurring in some of these areas.

The one observed location of parrotfeather that was inventoried was hand-pulled in 2007. It was not observed to reappear in this location in 2008, but viable fragments may still be present at the site.

Purple loosestrife has been treated with herbicide, pulled and cut during past inventories. This has reduced the population of mature plants, and prevented many

plants from setting seed, but has not significantly reduced the soil seed bank and continuing germination of new plants.. Due to a lack of available funding and staff, herbicide treatments have not occurred in recent years.

3. WEED CONTROL PLAN

A. Priority Species

Purple loosestrife, yellow iris, and Bohemian knotweed populations have been mapped and inventoried in the preserve since 1997. This annual inventory will be expanded to include all weed species of concern, and, where possible, their treatment using the methods outlined in this plan. Surveys and treatments should be done simultaneously to maximize efficient use of time and resources, as well as to more effectively track populations and treatments. Treatments will be monitored to assess effectiveness, using an adaptive management strategy to continue to control and eradicate problem weeds.

1. Bohemian knotweed

Continue to use imazapyr at 1% concentration (Habitat) in foliar spray as main management tool, with 100% concentrated glyphosate (Rodeo) injection as necessary. Continue to treat re-growth in restoration areas (highest priority), and monitor large patch on property line for encroachment into NAP. Continue to treat large patch on interpretive trail, bagging any remaining cut stems, and removing off-site.

2. Purple loosestrife

Continue annual monitoring and add a treatment component (preferably simultaneous) of existing and new patches and plants. Surveying and treatment should occur during the growing season, ideally during peak bloom. Smaller plants whose roots and stems can be removed completely should be pulled, and larger ones treated using a cut-stem application of aquatic labeled glyphosate (Rodeo) to avoid off-target effects.

3. Yellow Iris

Other land managers have found that a cut-stem and injection treatments with Rodeo or other aquatic labeled glyphosate products to be effective in controlling yellow iris. This method of treatment was done in a few small trials in 2008. Another potential method for treatment is foliar application of a glyphosate and imazapyr mixture, applied during flowering. Results of 2008 trials will be monitored to determine effectiveness and both methods assessed for feasibility in a larger-scale eradication effort. Treatment of existing populations and surveying for new patches of this plant can be done in combination with annual monitoring.

4. Parrotfeather

Monitoring should continue of the only known occurrence of this species, and when found, the plants should be pulled, along with as much root material as possible.

5. English Ivy

Surveying and treating this plant has proven very difficult due to the inaccessible terrain of the spruce wetland. Therefore, it is impossible to know how much area ivy has colonized within the preserve. However, what can be identified and reached from trails, roads and waterways should be treated by cut-stem or foliar application of triclopyr or glyphosate, especially where it is climbing into the tree canopy. These surveys and treatments can be done in conjunction with annual monitoring.

6. Himalayan Blackberry

Where practical, blackberry should be controlled with a combination of mowing and foliar spray or cut-stem of triclopyr. This technique will reduce biomass and vigor of blackberry patches, making treatment of regrowth easier, and avoid damage to nearby native species. It is important to keep blackberry out of restoration areas and away from shorelines; in these high-priority areas, blackberry should be kept from overtaking native plants.

B. PLANNED TREATMENTS

Spring 2009:

English ivy: follow up on past treatments of ivy along Blue Slough Road, especially where it is re-growing into the tree canopy. Treatment method is cut stem using 50% solution of triclopyr. If feasible, expand treatments to other infested areas accessible by road or trail, focusing on where ivy is climbing into trees.

Summer 2009:

Canoe Inventory and Treatments:

Beginning in mid-July, conduct canoe inventory and treatment of water-accessible weed species. Efforts should be made to survey entire preserve, but focus should be on Blue and Preachers Sloughs, as well as the main stem of the Chehalis River. Include all high-priority species in survey and control efforts.

Bohemian Knotweed: Map and treat all remaining patches with foliar imazapyr at 1% concentration, using aquatic-rated glyphosate injection at 100% concentration where necessary to prevent off-target impacts.

Purple loosestrife: Map and treat by hand-pulling small plants. Care must be taken to remove entire root system, as plants can re-sprout from fragments. For plants too large to pull, foliar spot-spray with aquatic-rated glyphosate at 1-2% concentration on larger plants, or use cut-stem method with 30% concentration. If possible, time treatments for after peak bloom (late August), and conduct follow-up at end of season to catch any missed plants or re-sprouting stems.

Yellow iris: Map and treat with stem injections and cut-stem application of 3mL of glyphosate at 100% concentration per square foot of infestation (use other methods if proven more effective). Spot spraying with a mix of surfactant, 1% glyphosate and 1% imazapyr should also work, and should be tested in selected

areas and monitored for success. Treatment after flowering (late July) will be most effective.

Parrotfeather: Monitor known location of parrotfeather (must be surveyed at lower tide), and pull any re-growth if found. Map and pull any other infestations if found during course of canoe surveys.

Ivy: Map and treat where climbing into tree canopy using cut-stem methods with 50% concentrations of triclopyr. Cut and treat all accessible stems that are climbing into the canopy. Use binoculars to survey for less accessible vines, and mark approximate locations on aerial photo.

Other treatments:

Bohemian Knotweed: Treat any remaining or newly sprouting knotweed patches with foliar spot-spray of imazapyr at 1% concentration, injecting with 100% glyphosate where necessary to prevent off-target effects. Focus on restoration areas as the highest priority, but treat all knotweeds found to be growing within preserve boundaries. Closely monitor large infestation on private property adjacent to old Preachers Slough restoration area and treat any sprouts occurring inside the NAP.

Ivy: Continue to conduct follow-up on past treatments of ivy growing along Blue Slough Road: stems that are climbing up into tree canopy must be cut and a 50% concentration of triclopyr applied.

Himalayan blackberry: in early to mid-summer, mow any patches occurring within or threatening restoration areas. Treat these sites as the highest priority. If feasible, mow patches occurring along shorelines, focusing on potential future restoration sites, smaller infestations and most accessible areas as higher priority.

Fall 2009:

Himalayan blackberry: using foliar spray of triclopyr at 1.5-2% concentration, treat all re-growth of patches that were mowed in summer. Spray after fruiting but before senescence for highest efficacy.

Winter 2009:

English Ivy: if time and funding allow, areas of dense ivy infestation can be treated with a foliar application between January and February, ideally before native bud break. Ivy can be spot-sprayed with a mixture of 4% triclopyr and surfactant, focusing on the highest priority areas: bases of trees, restoration areas, and shorelines. Note: when spraying along shorelines, aquatic-labeled herbicides must be used

2010 to 2015: The above schedule should be followed for the next five years; adjusting as necessary to accommodate changes in population and available treatment methods. For example, if iris treatment methods prove ineffective, new methods should be explored, implemented and monitored for efficacy. If goals for reduction of loosestrife and iris populations are met within the five year period, a new objective of eradication of these species should be pursued. After

the five year period, if weed populations are significantly reduced, inventory and treatment schedule may be adjusted to a biennial basis to continue monitoring and treat new and resurgent invasions where necessary.

Note: All herbicide applications should be done on a spot-treatment basis, using the minimum amount necessary to be effective and avoiding contact with any native plant species. Any treatments located near water sources must use aquatic-labeled herbicides and surfactants. Herbicides must be applied by, or under supervision of, someone with a current Washington State pesticide applicator's license and must follow label directions.

C. MONITORING

Annual inventory and mapping of invasive species distribution will continue, providing feedback on the extent and distribution of invasive plant species, their impact on the site's natural features, and on the level of success of control efforts. This weed management plan should be reviewed periodically to assess the effectiveness of treatments, and a strategy of adaptive management should be implemented based on the results of these reviews.

During each summer weed inventory and treatment, every effort should be made to relocate the previous year's weed populations, in order to track success of treatments. The current weed map should be maintained and updated annually with weed locations, patch size and notes on previous year's treatment effectiveness. This data should be stored in the CRSP file on the DNR's GIS database ("snarf") drive.

Continued monitoring of yellow iris herbicide trial locations is necessary, beginning in spring of 2009. In 2008, eight locations were marked with ribbon flagging and recorded with GPS. Size of patch and number of stems injected were recorded for each location, and the information was entered into GIS and a weed logbook for the CRSP. These eight trial sites will be examined as a part of the annual inventory to determine the efficacy of the stem injection treatment, and data will continue to be recorded into the CRSP weed database.

Appendix 1. HERBICIDE APPLICATION TABLE

Species code	Best timing	Herbicide and Rate	Recommended surfactants
HEHE (foliar)	winter	Garlon 4%, 5 oz./gallon	Hasten (.5-1%) with addition of Scythe (.5%)
HEHE (cut stem)	summer	Garlon 50%, 16oz/quart	---
IRPS (foliar)	after peak bloom	Rodeo 1%, plus Habitat 1%, 2 oz each/gallon	Agridex 1%
IRPS (injection)	after peak bloom	Rodeo 100%, 3 mL per sq. foot of patch	--
LYSE	after peak bloom	Rodeo 1-2%,	Ortho X-78, Li-100 1%
POxBO	summer	Habitat 1%, 2 oz/gallon	R-11 1%
RUDI	fall	Garlon 1.5%, 2 oz/gallon	Herbimax 1%

