

## II-E. STEWARDSHIP PLAN

### Introduction

The Nisqually-Mashel State Park Site is located in the heart of the Nisqually River watershed near Eatonville, Washington, in the Cascade foothills of southern Pierce County and northern Thurston County (see *Figure B- 2: Regional Area Map*). The park lies midway along the Nisqually River between the river's delta at Puget Sound and its headwaters on Mount Rainier. It is situated on the boundary between the Southwest Cascades and the Puget Lowland ecoregions (Pater et al. 1998). Three significant water bodies are located within the park: the Nisqually River, Ohop Creek, and the Mashel River. Those streams bring together important ecological processes and areas rich in cultural history. The landscape of the park is highly variable, with dense, mature forested river valleys and terraced floodplains; steep slopes and bluff faces; complex stream corridors; South Puget prairie; and rolling plateaus and ridges characterized by forests of various ages that reflect a history of logging activity.

This stewardship plan for the Nisqually-Mashel State Park Site provides strategies for effectively managing the natural and cultural resources of the park. This plan is intended to protect the park's diverse system of recreational, cultural, historic, and natural sites. The geographic scope of this plan was limited to the existing Nisqually-Mashel State Park Site boundary; however, stewardship guidance is also provided for areas within the proposed long-term boundary to the extent possible based on available data for the area. This plan describes current resource conditions within the park; provides stewardship prescriptions that are specific to the important resources within the park; and discusses regulations, park safety, climate change, and stakeholder coordination.

The vision for the Nisqually-Mashel State Park Site is to create a multi-use park while preserving the site's natural and cultural resources for future generations and providing for exceptional visitor experiences. The vision will bring challenges in terms of balancing recreational use with resource protection. For example, the park is adjacent to one of the most important steelhead and Chinook salmon spawning reaches in the Nisqually River watershed. Although recreation within the riparian corridors of the Nisqually River and the Mashel River is a desired element of the park, preservation of critical species and critical habitat is also a driver of park objectives. In addition, access to the Nisqually and Mashel rivers is predominantly on steep slopes and, in some areas; the banks are eroding, limiting safe public access. This plan provides stewardship strategies that are essential for successfully balancing difficult issues such as these.

Park stewardship includes both short-term and long-term challenges. Short-term challenges include managing the introduction and spread of invasive species and implementing forest thinning (as prescribed by the *Nisqually-Mashel State Park Forest Health Plan*) to reduce fuel loading and accelerate the development of old-growth stand characteristics. Long-term stewardship challenges include protecting unique and high-quality habitats such as the park's wetlands and the Mashel Prairie, maintaining wildlife



use by limiting public access to valuable wildlife habitats, protecting the rich cultural resources within the park, and protecting park infrastructure.

In general, actions necessary for stewardship of the park's resources will include the following:

- Seasonal or permanent closures of park trails, camping areas, or other use areas for restoration or protection of park resources.
- Exclusion of the public from sensitive areas, such as wildlife corridors; migration corridors; spawning reaches of the Nisqually River, Mashel River, and Ohop Creek; nest sites; fragile vegetation communities; and sensitive cultural resources.
- Active restoration to retain or improve ecological functions and protect cultural resources.
- Adaptive management to address issues before they become problems and to ensure a high level of protection for park resources, including existing high-quality habitats, habitat used by wildlife, places of cultural significance, and park infrastructure.

The stewardship program for the Nisqually-Mashel State Park Site will use Washington State Parks' team of resource specialists to work with park staff, park users, and other interested parties to balance the complex and often conflicting demands of environmental protection, cultural preservation, and outdoor recreation. Conservation activities at the park will include an inventory and assessment of natural and cultural resources, management planning, applied research, stewardship training, and activities related to special topics of statewide significance such as salmon recovery and preservation of wildlife corridors.

### Stewardship Plan Development

This stewardship plan was developed using a number of existing resources for reference and guidance, by synthesizing stakeholder priorities gleaned from discussions and workshops, and by conferring with Washington State Parks staff. Observations during two site visits in early 2008 helped in the preparation of site descriptions and provided a context for the stewardship prescriptions. Site visits and the documents developed to support park site planning covered areas within the existing park site boundary. Much less information was available on the additional properties included within the proposed long-term boundary. As a consequence, some areas of this plan have more detail than others.

The documents consulted during the development of the plan range from regional planning documents to park-specific assessments. They are described in the following subsections and included as appendices to this Master Plan.

#### Nisqually-Mashel State Park Rare Plant and Vegetation Survey

In 2006, LYRA Biological conducted an assessment of vegetation within the existing park site boundary and prepared a report documenting onsite plant communities and



observations while surveying for rare plant species (LYRA Biological 2006) (see Appendix K). Although no rare plants were observed within the existing park site boundary, the report provides a list of rare plants that would be expected to be found based on site conditions. The report also includes detailed observations of plant community associations and their distribution, and identifies several rare plant associations found in the park area including lodgepole pine - Douglas-fir / salal forest, Douglas-fir - Pacific madrone / salal forest, and Douglas-fir / beaked hazelnut / sword fern – threeleaf foamflower forest.

#### Nisqually-Mashel State Park Forest Health Plan

In 2008, the Center for Sustainable Forestry at Pack Forest, University of Washington (UW), completed the *Nisqually-Mashel State Park Forest Health Plan*, which includes a forest health assessment and a forest management plan for the park (Ettl and Emmons 2008) (see Appendix F). The forest health plan includes prescriptions for forest management within the existing park site boundary park based on field surveys of plantation-dominated stands, an examination of corresponding forest modeling results, and an assessment of existing data from LYRA Biological (2006). The plan also includes prescriptions for improving the quality of wildlife habitat in the park. The prescriptions seek to accomplish this goal mainly through forest practices that promote old-growth forest conditions. Forest management prescriptions are designed to strategically accelerate stand development in previously logged areas through a series of silvicultural thinnings, and to increase forest species diversity by planting a greater diversity of tree species.

#### Cultural Resources Survey of Proposed Nisqually-Mashel State Park

Eastern Washington University conducted a cultural resources survey of the area within the existing park site boundary in 2008 and documented the results of research and onsite investigations (Emerson and Ives 2008) (see Appendix G). The survey investigated ten 10-acre cultural resources survey parcels distributed through the site in areas with potential for park development. The survey included a thorough analysis of historical records and discussions with people with local knowledge of the property and its history. Although no cultural resource sites were previously recorded at the site, the survey identified and recorded three prehistoric archaeological sites within the proposed Nisqually-Mashel State Park Site (Emerson and Ives 2008.) An additional prehistoric site and numerous historic cultural resources were identified within 1 mile of the existing park site boundary. The report concluded that most of the park site appears to have a low to medium probability to contain unrecorded cultural resources; however, riverine settings and the Mashel Prairie are considered high probability areas.

#### Nisqually River Management Plan and Nisqually Watershed Stewardship Plan

The *Nisqually River Management Plan* and the *Nisqually Watershed Stewardship Plan* were developed through a state-level effort to preserve the Nisqually River. The effort



was motivated by evidence that the river's integrity was being threatened by human activity.

Washington's 1971 Shoreline Management Act designated the Nisqually as a "river of statewide significance." In 1985, the Washington State Legislature approved Substitute House Bill 323, directing the Washington State Department of Ecology to prepare an overall management plan for the Nisqually River. In response to the legislature's direction, the Department of Ecology established the Nisqually River Task Force in 1985 to develop a management plan. The task force comprised a wide range of stakeholders in the river basin, including timber, agriculture, and hydropower interests; conservation and environmental organizations; private landowners; resource management agencies; and the Nisqually Indian Tribe. In 1987, the final recommendations of the task force were published as the Nisqually River Management Plan and adopted by the legislature (Nisqually River Task Force 1987).

The Nisqually River Management Plan focused only on the riparian corridor of the Nisqually River and the lower 3 miles of the Mashel River. Subsequently, it was decided that the management zone should be expanded to encompass the entire Nisqually River watershed, which prompted the development of the Nisqually Watershed Stewardship Plan. That plan provides recommendations and implementation guidelines for stewardship of the economic, cultural, and natural resources of the entire river basin (Nisqually River Council undated).

#### Other Plans and Documents

Also consulted for the development of this stewardship plan were the following:

- *Nisqually Chinook Recovery Plan and Updates* (Nisqually Chinook Recovery Team 2001 and 2008).
- *Nisqually Watershed Chinook Salmon Recovery Plan – 3 Year Work Program 2008-2010* (Nisqually Chinook Recovery Team 2008).
- *Environmental Constraints Report: Nisqually-Mashel Property* (Herrera 2008).

#### Land Use History

The land constituting the Nisqually-Mashel State Park Site has supported a wide variety of human uses. User groups have included Native Americans (predominantly the Nisqually Indian Tribe), early European pioneers and settlers, logging operations, and now Washington State Parks and associated entities. Currently, the park's neighbors are the UW Center for Sustainable Forestry to the east, a mixture of private timberlands to the south and west, low-density rural housing to the north, and agricultural land (i.e., Ohop Valley) and land owned by the Nisqually Land Trust to the west.



### Native American Use

The Nisqually River watershed is home to the Nisqually Indian Tribe, and one of the tribe's important winter village sites was located near the mouth of the Mashel River. Nisqually tribal history has played a significant role in shaping the landscape and rich cultural resources of the park.

The state park is the site of the 1856 Mashel Massacre, which was part of the Indian Wars of Western Washington. There is a privately owned cemetery in the Mashel Prairie area that is thought to include the grave of Indian Henry, believed to be a Klickitat or Yakama who crossed the Cascade Mountains to live with the Mashel bands. Indian Henry was widely known as an excellent woodsman and guide and the subject of many tales passed down over the years.

Human-made fire most likely played an important role in shaping the landscape in the Mashel Prairie and near the Mashel River (Emerson and Ives 2008). Gathering of traditionally used plant species likely helped to disperse some plant species and to influence the growth of plant populations and the development of plant community composition.

### European Settlement and Development

In the last 200 years, life in the Nisqually watershed has undergone many of the same changes that have taken place throughout America during that time period. The Ohop Valley was settled by Europeans in the 1800s, after which European settlement increased and produced changes in historical land use. European influence, agriculture, industrial practices, and religious beliefs characterized the dominant culture.

By 1915 the Weyerhaeuser Company had purchased much of the land within the existing park site boundary, although most of the virgin timber had already been harvested (Emerson and Ives 2008). The Weyerhaeuser Company continued to conduct logging operations on the property until the property was purchased by Washington State Parks.

### Park Establishment

Washington State Parks began studying this site based on recommendations in the *Nisqually River Management Plan* (Nisqually River Task Force 1987), which was approved by the Washington State Legislature in 1987. That plan identified the need for a "major destination area/put-in site at the confluence of the Nisqually and Mashel rivers together with trails up the Mashel River." Washington State Parks began working with the newly formed Washington Wildlife and Recreation Coalition in 1989 to establish a statewide program for acquisition and development of habitat and recreation sites. The Nisqually-Mashel site was identified as a funding opportunity for this program, and, since 1990, State Parks has received funding from the Washington Wildlife and Recreation Program to facilitate the accumulation of 1,230 acres.



In 2005, the Washington State Parks Commission formally identified a Centennial Plan goal to develop the new Nisqually-Mashel State Park Site. The agency received a capital appropriation for the 2005–2007 biennium to prepare a master plan for the park, including the development of a classification and management plan (CAMP) as a first step. Since spring 2006, a number of public meetings and workshops have been held to provide forums for public interest in the development of the park.

The majority of public comments addressed protecting and interpreting the park's natural and cultural resources, including low-impact development methods, acquiring the adjacent Manke Timber property, and providing a variety of recreational experiences, particularly hiking, equestrian, and biking trails. An exploratory committee comprising key stakeholders (including Washington State Parks, the Nisqually Indian Tribe, the Nisqually River Council, the Nisqually Land Trust, local government agencies, special interest groups, and members of the community) was also formed in June 2006 to provide guidance on park planning issues and the CAMP process. By October 2008, after a thorough analysis and public review of various conceptual design alternatives, the conceptual plan for the park began to materialize.

Currently, the park site encompasses 1,230 acres. Park planning efforts have identified expansion opportunities that would result in an eventual park area of 3,434 acres. The boundary of this extended area is referred to as the *Long-Term Park Boundary* (see *Figure B-4: Major Property Ownership within the Long-Term Park Boundary*). The Long-Term Park Boundary was determined through stakeholder meetings and the CAMP process to promote the acquisition of lands that would best facilitate: the development of a sustainable park framework, provision for short-term and long-term access (for all forms of transportation), and optimization of the park's scenic attributes. The Long-Term Park Boundary is delineated on the east by State Route (SR) 7 (extending the current park site boundary eastward to annex portions of Pack Forest and some property owned by Tacoma Power); on the south by an east-west line extending from the southwest corner of the existing park site (with a 600-foot buffer southward to encompass an upland terrace/bluff and forest road); on the west by the westernmost extent of the Ohop valley; and on the north by SR 7 (buffered 300 feet north of its right-of-way).

The total area of planned development within the park is 525 acres, which is 15 percent of the area within the Long-Term Park Boundary. The remaining 85 percent of the park area (2,909 acres) consists of preserved natural areas, including forests, meadows, wetlands, and riparian zones. The projected total length of roads (paved and unpaved) in the park is 7.65 miles. The projected total length of trails (pedestrian, bike, and equestrian) is approximately 25.25 miles. Eight bridges are planned within the park, in addition to eight scenic overlooks.



## Natural Resources

This section generally describes the existing conditions of natural resources within the Nisqually-Mashel State Park Site. Additional details can be found within studies prepared on behalf of the Nisqually-Mashel State Park Site and cited within each section.

The variety of natural resources located within the Nisqually-Mashel State Park Site is truly compelling and includes: forests of varying age; rare plant associations; rivers, creeks and their riparian areas; wetlands; prairies; and habitat for many aquatic and terrestrial wildlife species including several listed species. These important natural resources are described in more detail in the following subsections.

### Geology and Soils

When glaciers extended into the Puget Sound basin, including the park vicinity, they carried material that had been scoured from the surrounding landscape and more distant regions in northern Washington and Canada and deposited it under the glaciers. The deposited material formed dense basal till and moraines. During periods of glacial retreat, rivers flowing out of the base of melting glaciers deposited material called *glacial outwash*, which is similar in character to river gravel bars, sand shoals, and other sorted and mixed material deposits. The landscape character of the park was probably affected by the Nisqually Glacier as alpine glaciers extended to the park vicinity.

The park is located predominantly on glacial outwash terraces that have been incised by the erosive action of the rivers and streams in the area. Along the riparian corridors, river terraces of the Nisqually River, Ohop Creek, and Mashel River are the dominant landforms.

The soils in the park were derived from glacial outwash and, in places, are characterized by a volcanic ash component that was deposited during the cycles of eruptions of Mount Rainier, Mount Saint Helens, and other volcanoes. The rivers redistributed soils deposited by glaciation, volcanic activity, sediment and bedrock erosion, and other sources along the river valleys and terraces. The poorly developed glacial soils are classified as Aquic Xerofluvents (SCS 1955). The Kapowsin, Barneston, and Everett soil series found within the park are included in this classification, and all of the soils are coarse and well-drained, enhancing the effects of summer droughts (SCS 1955). Canyons and other steep-bank areas are dominated by the Kapowsin gravelly loams. Upland sites in the park form the Mashel Plateau that consists of a combination of Kapowsin gravelly loams and Barneston gravelly coarse sandy loams. The Spana series is present in the Mashel Flats just outside the park boundary, and those soils may be coincident with the Mashel Prairie. The Barneston and Everett series are generally poor soils that are associated with lower densities of forest stands and slower stand development. Moister soils are often associated with the clayey loam Bellingham series (NRCS 2008).



## Plants and Wildlife

Plant associations found in the park site, although primarily dominated by Douglas-fir, exhibit significant variety and have been identified using categories defined by species composition, landscape position and ecology, and land use history. Secondary plant assemblages are present as inclusions (small, unique community patches) or as mosaics (complex interlocking or interspersed patches) within the landscape matrix of the identified primary vegetation type.

During a vegetation survey in 2006, LYRA Biological identified a total of 283 vascular plant taxa on the Nisqually-Mashel State Park Site (280 species, with 3 of these species represented by 2 subspecies) (LYRA Biological 2006). Of those, 89 species were nonnative, accounting for 32 percent of the total. Although no rare or protected plants were observed on the park site during the surveys, several unique plant associations were observed.

LYRA Biological conducted a search of the Washington Natural Heritage Program (WNHP) geographic information system (GIS) database (which tracks rare plant taxa in the state, including endangered and threatened species) and a thorough review of WNHP's other off-line maps and habitat descriptions (WDNR 2008). The investigators identified 16 WNHP species with a moderate to high likelihood of occurring in the park but found only one "watch" (not formally tracked) species (Sierra marsh fern (*Thelypteris nevadensis*) occurring on ravine slopes adjacent to the Mashel River (LYRA Biological 2006).

The vegetation survey documented a considerable amount of potential habitat within the park for several listed plant species (LYRA Biological 2006). Historical occurrences of tall bugbane (*Acaea elata*, formerly *Cimicifuga elata*), a state and federally listed rare plant, have been recorded at several locations in Pierce County, one within 3 miles of the existing park site boundary. Western burning bush (*Euonymus occidentalis*) may also occur at the Nisqually-Mashel State Park Site. Western burning bush is a threatened species and is typically found in forests within shaded draws and ravines.

Many wetlands within the park are open-canopied and suitable habitat for a variety of sedge species. Two listed sedges were identified in the pre-field review, Buxbaum's sedge (*Carex buxbaumii*) and bristly sedge (*C. comosa*), with a known occurrence less than 5 miles from the park). Several other rare species that may inhabit the park include northern bog aster (*Aster borealis*), bulb-bearing water-hemlock (*Cicuta bulbifera*), water howellia (*Howellia aquatilis*), floating water pennywort (*Hydrocotyle ranunculoides*), and Nuttall's quillwort (*Isoetes nuttallii*). All of these species have been observed in similar wetland habitats, within 3 to 7 miles of the existing park site boundary.

Forest plant community associations were surveyed and are documented in the *Nisqually-Mashel State Park Forest Health Plan* (Ettl and Emmons 2008). The largest sections of mature forested habitat within the park site occur in the riparian areas of the Nisqually





and Mashel rivers. These areas of mature riparian forest are unique and increasingly rare in the Puget Sound area.

Other unique plant associations observed in the rare plant survey (LYRA Biological 2006) are shown in Table 1 along with their LYRA polygon locations shown on Figure E-1: Map of Nisqually-Mashel Park Site Lyra Biological Polygons.

Wildlife habitats in the park vary dramatically, and this variation is highly correlated with the variation in the park's land use history. The unlogged floodplain terraces and steep slopes in the river canyon are characterized by mature, coniferous, riparian forests (dominated by Douglas-fir, western hemlock, and western red cedar) and immature floodplain communities (dominated by red alder). The upland plateau areas exhibit a legacy of logging and represent varying stages of plantation forest regeneration. Wetland areas are characterized by flood-tolerant deciduous species (including Oregon ash and red alder) and emergent plants (sedges and rushes) and are typically found associated with drainages, stream corridors, depressions, and/or hydric soils. The Mashel Prairie is identified as a unique and important habitat, and its creation and persistence was most likely supported by traditional burning practices.

State priority wildlife species occur in all major riparian corridors within and adjacent to the park, including the Nisqually River, the Mashel River, and Ohop Creek. These species include the bald eagle, osprey, turkey vulture, and Pacific Townsend's big-eared bat (WDFW 2008). In addition, there are waterfowl concentrations in wetlands and riparian zones within and adjacent to the park. Other park site terrestrial residents include cougar, beaver, black bear, deer, and elk.

According to the results of the Pierce County Biodiversity Assessment and GAP Analysis (Brooks et al. 2004) and site-specific assessments of the habitat types in the Nisqually-Mashel State Park Site, the greatest potential contribution of the area to regional wildlife conservation, locally and across the Puget Lowland ecoregion, would result from: (1) protection of the prairie habitat in the Mashel Prairie, (2) maintenance of relatively undeveloped riparian corridors, and (3) conservation of large (more than 150 acres) tracts of relatively contiguous evergreen forests (Brooks et al. 2004). Although encountering increasing pressures from agricultural and residential development downstream, the park site can be viewed as part of a larger corridor that provides near continuous forest cover from the Cascade Mountains to the South Puget Sound (Ettl and Emmons 2008).

Three major rivers and streams define the park boundaries: the Nisqually River, the Mashel River, and Ohop Creek. In addition, numerous seasonal and intermittent streams flow from the high terraces down into the canyon and ravine areas of the major drainages. The rivers and streams support a wide variety of fish species, several of them federally and state protected. The Nisqually River provides important breeding, feeding and migrating habitat for five species of Pacific salmon—Chinook, coho, pink, chum, and steelhead—as well as sea-run cutthroat trout.



**Table 1. List of rare plant associations observed at the Nisqually-Mashel State Park Site (LYRA Biological 2006).**

Abbreviation	Association Name	Common Name	LYRA Polygon Location(s)	Status <sup>1,2</sup>
PICOC2-PSME/GASH	<i>Pinus contorta</i> var. <i>contorta</i> – <i>Pseudotsuga menziesii</i> / <i>Gaultheria shallon</i> forest	lodgepole pine - Douglas-fir / salal forest	23	G1G2S1
PSME-ARME/GASH	<i>Pseudotsuga menziesii</i> – <i>Arbutus menziesii</i> / <i>Gaultheria shallon</i> forest	Douglas-fir - Pacific madrone / salal forest	35, 39	G3S2
PSME/COCO6/POMU-TITR	<i>Pseudotsuga menziesii</i> / <i>Corylus cornuta</i> / <i>Polystichum munitum</i> – <i>Tiarella trifoliata</i> forest	Douglas-fir / beaked hazelnut / sword fern – threelobed foamflower forest	36, 37	GNRS2?
PSME/GASH-HODI	<i>Pseudotsuga menziesii</i> / <i>Gaultheria shallon</i> – <i>Holodiscus discolor</i> forest	Douglas-fir / salal – oceanspray forest	4, 7, 8, 20, 21, 22	G2G3S2
PSME/GASH/POMU	<i>Pseudotsuga menziesii</i> / <i>Gaultheria shallon</i> / <i>Polystichum munitum</i> forest	Douglas-fir / salal / sword fern forest	4, 5, 6, 14, 16, 17, 19, 20, 21, 23, 25, 26, 27, 28, 29, 32, 34, 35, 37, 43, 44, 45	GNRS3S5Q
PSME-THPL/OXOR	<i>Pseudotsuga menziesii</i> – <i>Thuja plicata</i> / <i>Oxalis oregana</i> forest	Douglas-fir – western redcedar / Oregon oxalis forest	18, 30, 32, 33, 40, 42, 46	G3G4S2
PSME-TSHE/VAOV2/POMU	<i>Pseudotsuga menziesii</i> – <i>Tsuga heterophylla</i> / <i>Vaccinium ovatum</i> / <i>Polystichum munitum</i> forest	Douglas-fir – western redcedar / evergreen huckleberry / sword fern forest	3, 38	G3S1

Abbreviation	Association Name	Common Name	LYRA Polygon Location(s)	Status <sup>1,2</sup>
TSHE-PSME/POMU-DREX2	<i>Tsuga heterophylla</i> – <i>Pseudotsuga menziesii</i> / <i>Polystichum munitum</i> – <i>Dryopteris expansa</i> forest	western hemlock – Douglas-fir / sword fern – spreading woodfern forest	2, 10, 11, 18, 30, 32, 36, 39, 40, 42	G3G4S3
CAVE6	<i>Carex vesicaria</i> herbaceous vegetation	blister sedge herbaceous vegetation	4	G4QS?

<sup>1</sup>Status Codes (See <http://www1.dnr.wa.gov/nhp/refdesk/communities/index.html> for detailed descriptions):

Global:

G1 = Critically imperiled

G2 = Imperiled

G3 = Very rare and local throughout its range, found locally in a restricted range, or otherwise vulnerable to extinction

G4 = Widespread, abundant, and apparently secure

G5 = Demonstrably widespread, abundant, and secure

GNR = Globally not rated

Washington State:

S1 = Critically imperiled

S2 = Imperiled

S3 = Rare or uncommon

S4 = Widespread, abundant, and apparently secure

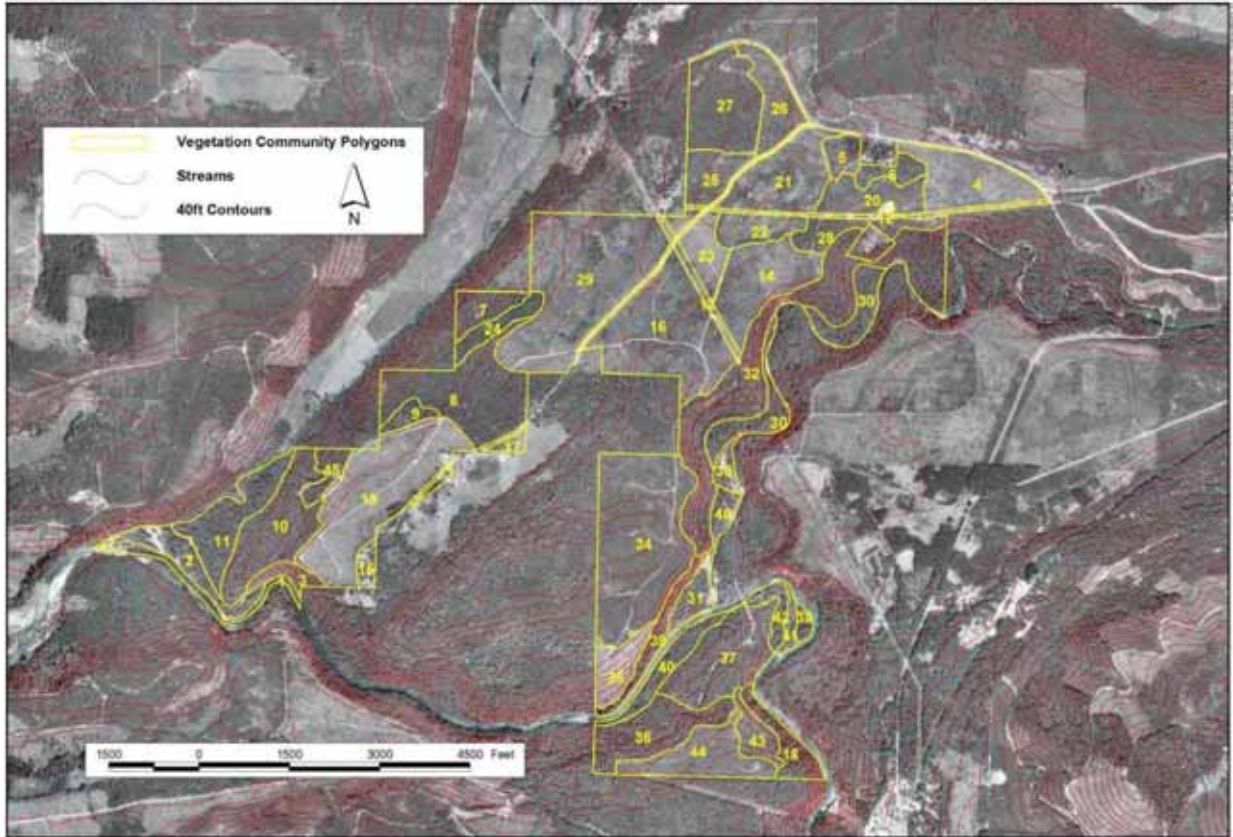
S5 = Demonstrably widespread, abundant, and secure

Q = Taxonomic status is questionable/numeric rank may change

? = Unknown/unclassified

<sup>2</sup>Where there is more than one numeric range rank (e.g., G2G3), it is used to indicate the range of uncertainty in the status of a species or community.

**Figure E-1.** Map of Nisqually-Mashel Park Site polygons surveyed by LYRA within the existing boundary (Lyra Biological 2006).



*Figure E-1. Map of Nisqually-Mashel State Park Site polygons surveyed by LYRA (LYRA Biological 2006).*

The systems of the Nisqually River, the Mashel River, and Ohop Creek are dynamic and depend on natural hydrologic and geomorphic disturbances to maintain their functions. Flood events sometimes cause rivers and streams to abandon old channels and carve new ones through riverside brush and forests. Floods deposit logs and sediments, which support soil development and vegetation growth and influence the distribution of stream gravels, which support aquatic species. Young willows and alder aggressively colonize freshly scoured sites, and resist the sun and rain until other species can become established. Such processes can be observed in the riparian corridors of the Nisqually-Mashel State Park Site. The patterns of channel formation and vegetation communities seen in the riparian areas tell the story of numerous past floods and forests that grew and fell and now provide the backbone of the park site's riparian systems.

The riparian areas are also significant in that they provide vital wildlife movement corridors and connect habitats from Mount Rainier to Puget Sound.

### Wetlands

Wetlands are a common feature in the park, the largest density and extent being associated with the main river corridors. Other wetlands are associated with drainage systems, topographic depressions, and/or specific soil types.

Wetland areas were mapped based on the National Wetlands Inventory (USFWS 2008), county wetland inventories (Pierce County 2006; TRPC 2002), and hydric soil information from the Natural Resources Conservation Service (NRCS 2008). Those data sources provide coverage of predominantly larger wetland areas in the park and are documented in the environmental constraints report (Herrera 2008). The wetlands shown in the report are not based on comprehensive field surveys or wetland delineations; therefore, the coverage is not complete or exhaustive, but the report provides an estimate of the overall pattern of the larger wetlands systems in the park and should be used as a basis for field verifying the actual presence of wetlands and adding newly observed wetland areas.

Numerous springs flow out of the upper terraces of the park, providing unique habitats and contributing water to streams and wetlands. Some, such as Medicine Springs, also have a long history of human use.

The wetlands in the park provide unique plant and animal habitats, store and filter stormwater runoff, provide base flows to streams and rivers during summer droughts, impound floodwaters, and provide nutrients and other food sources to downstream aquatic resources.

### Upland Forests

The mature, primary forests of the canyon slopes and river terraces are almost exclusively the Douglas-fir-western hemlock-western red cedar forest type. In contrast, the young plantation forests of the upland flats are largely the Douglas-fir forest type, though there



are also several notable, large wetland communities and one rather sizable plantation of the lodgepole pine–Douglas-fir forest type (a rare forest community and unusual in this part of the Puget Trough) (LYRA Biological 2006).

A very small amount of the Douglas-fir–Pacific madrone forest type occurs at the boundary of the upland flats and canyon slopes, just north of the Nisqually River, where it occupies a very narrow (50 to 100 feet), intermittent strip along the uppermost slopes and canyon rim (Herrera 2008).

Both the red alder–bigleaf maple forest type and the wetland community type are under-represented in the forest community associations identified (Herrera 2008), because many of the patches of these forest types are less than 2 hectares in size; therefore, they are recorded as minor components of the more extensive Douglas-fir and Douglas-fir–western hemlock–western red cedar–dominated forest types throughout the park.

The upland forests provide habitats for many wildlife species, and they support and protect adjacent riparian and wetland areas by providing shade and organic materials such as detritus and woody debris. A wide variety of wildlife species, including black bears, elk, deer, coyotes, bobcats, raptors, song birds, woodpeckers, owls, and other animals, use habitats within the park.

Mature forests, as well as younger forests with less common species assemblages, are becoming increasingly rare. The presence of these habitats within the Nisqually-Mashel State Park Site provides a unique opportunity to preserve some of Washington’s least common natural landscapes for future generations.

#### Bluffs, Mashel Prairie, and Power Line Corridors

The bluffs above the river corridors in the park provide unique habitats in terms of both structure and vegetation communities. Included are the bluff forests dominated by Pacific madrone and the bluffs above the confluence of the Nisqually and Mashel rivers, which are inhabited by nesting colonies of cliff swallows. The prairies and bluffs are rare ecological systems. The bluffs show the processes of glaciation, erosion, and deposition and have developed unique vegetation communities and animal inhabitants.

The Mashel Prairie is unique in that it is an emergent wetland area that has been maintained by a long history of human use and active management. It provides a rare example of South Puget prairie habitat that once was more widespread and supported human populations with food and fiber for many thousands of years. Moderately to poorly drained Spana loam and Dupont muck soils associated with the Mashel Prairie indicate poor drainage as opposed to excessive drainage conditions typical of many Puget Lowland prairies. In response, wetland plant species constitute a significant portion of the vegetation found within the Mashel Prairie. The prairies were formed by glacial processes that created the soils and landform conditions to support them.

Although not naturally derived, the power line corridors within the existing park site boundary provide views that provide a landscape context for the park. Along some

corridors, the glaciers of Mount Rainer (the source of the Nisqually River) are visible high above. Other corridors provide views of hydroelectric facilities and the river systems that frame the park. The views allow visitors to experience the surrounding natural beauty as well as the park's unique natural history.

Power line corridors are subject to frequent disturbance from vegetation maintenance activities and represent a stark contrast to the park's natural landscape. The corridors provide linear routes for movement and edge habitat that is preferred by many species. They often serve as vectors for noxious weeds and other invasive species.

### Cultural Resources

Culturally, the park represents a rich convergence of people, traditions, events, and values. For 10,000 years, native peoples, ancestors of the Nisqually Indian Tribe—Squali Absch or people of the grass—people of the river—have hunted, fished, and gathered in the Nisqually River watershed from the Whulge (Puget Sound) to Tacobet (Mount Rainier). The Nisqually River served as a meeting and trading hub for the Nisqually people and their interactions with other Salish Tribes. The park site provided both permanent and seasonal village sites for the Nisqually. Members of the Nisqually Tribe Parks Committee provided this description: “The Nisqually and their relatives, the Salish Tribes of the Pacific Northwest, were unique in what is now the continental United States. We did not practice any agriculture. The abundance of cedar (with its endless uses) and salmon (which could be preserved through smoking) gave us the resources needed for trading, accumulating wealth, and developing a sophisticated society.”

European settlement in the late 1800s resulted in many changes, including the establishment of agricultural homesteads in the Ohop Valley, an increase in land clearing, and widespread logging of forested land across the upland plateau areas in the Nisqually-Mashel State Park Site.

The many culturally significant resources within the park vary from prehistoric village sites to structures associated with early European agricultural settlements. Native American tribes that have ties with park land include the Nisqually Indian Tribe, Yakama Nation, Puyallup Tribe, Muckleshoot Tribe, Chehalis Tribe, and Squaxin Island Tribe. Native American tribes may have ties to several land areas within or adjacent to the Park including:

- Mashel Prairie area
  - Indian Henry Cemetery and Shaker Church site
  - Medicine Springs
  - Chief Leschi's Village (potentially)
- Mashel Massacre site (confluence of the Mashel River and the Nisqually River)
- Mashel River and Ohop Creek confluences with the Nisqually River
- Ohop Creek, Mashel River and Nisqually River Valleys



The Mashel Prairie is located in the west-central portion of the park site, and it represents one of the most culturally significant sites within the park's proposed Long-Term Park Boundary. The Nisqually Indian Tribe's famous leader, Chief Leschi, lived in a village in the area in the early- to mid-nineteenth century. Indian Henry (Soo-Too Let), another famous Native American, lived in the Mashel Prairie from approximately 1864 to 1895. His grave is still well maintained and frequently visited at the site where the Shaker Church (built in 1913) and cemetery used to be located. Prairies were so important to these native residents that the local people were ethnographically known as "prairie people" (Emerson and Ives 2008). Medicine Springs, which is located near the southern end of the Mashel Prairie, represents an area of immense spiritual significance to the Nisqually people.

Areas within the park site were the scene of events associated with the Puget Sound Indian War of 1855–1856. One such event was the Mashel Massacre, which occurred near the confluence of the Nisqually River and the Mashel River. That area represents a significant cultural landscape feature within the park. Although different accounts exist for the massacre, it is known that Governor Stevens ordered the stealth attack on a Nisqually encampment here in 1856, resulting in the deaths of a group of Nisqually men, women, and children.

The Ohop Valley cultural landscape, including the Old Milk Barn, represents historically significant areas from the perspective of late 1800s European settlement in the Nisqually-Mashel area.

## Resource Stewardship

This section describes overall prescriptions for park stewardship specific to the park site's resources and anticipated uses.

Resource stewardship activities at the Nisqually-Mashel State Park Site will include protection of natural and cultural resources, scenic resources, management of public access and education opportunities, and management of trail and campsite use to prevent resource and infrastructure degradation. To conserve the park's valuable natural and cultural resources, the following general management strategies will guide stewardship activities:

- Preserve existing high-quality resources, including mature forests, rivers and riparian areas, wetlands, bluffs, the Mashel Prairie, and other unique features.
- Conduct thorough plant inventories to verify the absence of sensitive and rare plant species in areas planned for development. It is recommended that all high-quality habitats be managed as if sensitive plants are present until their absence has been confirmed through inventories.
- Enhance degraded resources, including removing invasive species. Prevent invasive species from displacing native communities of plants and animals.





- Manage young forests to provide diverse habitats in the future, and improve ecological functions in riparian areas consistent with the park site's forest health plan.
- Protect water quality and natural flow regimes critical to long-term viability of aquatic biodiversity.
- Prevent fragmentation of riparian corridors, floodplains, and contiguous upland habitat blocks.
- Protect existing cultural resources.
- Inform and inspire visitors by providing access to and information about natural and cultural resource features. Increase public awareness of the biological diversity and intact ecology of the park's ecosystem.

The following subsections describe stewardship for the park site's natural, cultural, and scenic resources; public access and education; and management of trail and campground use to prevent resource and infrastructure degradation.

#### Endangered, Threatened and Listed Species

Washington State Parks is required by the Endangered Species Act (ESA) to protect endangered and threatened species, and to avoid any actions that might jeopardize their survival or adversely modify their critical habitats. In addition, stewardship of the Nisqually-Mashel State Park Site will actively promote the conservation of state-listed as well as federal candidate species.

The currently known listed species of plants and animals that occur near or at the Nisqually-Mashel State Park Site are provided in Tables 2 and 3. Recovery plans approved by the U.S. Fish and Wildlife Service and National Marine Fisheries Service provide recommendations for some listed species recovery should the park choose to participate in recovery plans. However implementation of recovery measures can pose enormous technical and fiscal challenges which need to be addressed by park planners before such action is taken.

Nevertheless, Nisqually-Mashel State Park Site staff will be responsible conserving the park site's rare animals and plants and enforcing the laws protecting endangered, threatened and candidate species.

#### *Stewardship Prescriptions:*

1. Manage the Nisqually-Mashel State Park Site to protect existing occurrences of state or federally listed or candidate species to the approval of jurisdictional agencies.
2. Manage the Nisqually-Mashel State Park Site in consultation with natural resource regulatory agencies to determine how best to manage habitat for protected species recovery.



**Table 2. State and federal threatened or endangered plant species documented in or near Nisqually-Mashel State Park Site.**

Species	Federal and State Status*
<i>Arenaria paludicola</i> (marsh sandwort)	Federally Endangered; State Potentially Extirpated
<i>Aster borealis</i> (northern bog aster)	State Threatened
<i>Euonymus occidentalis</i> (western burning bush)	State Threatened
<i>Isoetes nuttallii</i> (Nuttall's quillwort)	State Sensitive
<i>Lathyrus torreyi</i> (Torrey's peavine)	Federal Species of Concern; State Threatened
<i>Polystichum californicum</i> (California swordfern)	State Threatened

\*Status information was gathered on November 25, 2008, from the Washington Department of Natural Resources Washington Natural Heritage Program (WNHP) website:  
<http://www1.dnr.wa.gov/nhp/refdesk/lists/plantrnk.html>.

**Table 3. State and federal threatened or endangered animal species documented in or near the Nisqually-Mashel State Park Site.**

Species	Scientific Name	Federal and State Status
Bull Trout	<i>Salvelinus confluentus</i>	Federal Threatened, State Candidate
Canada Lynx	<i>Lynx canadensis</i>	Federal Threatened, State Threatened
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	Federal Threatened, State Candidate
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	Federal Threatened, State Threatened
Mazama (Western/Roy), Pocket Gopher	<i>Thomomys mazama</i>	Federal Candidate, State Threatened
Steelhead	<i>Oncorhynchus mykiss</i>	Federal Threatened, State Candidate

Source: WDFW 2008.

### Riparian Areas and Wetlands

The riparian corridors and their adjacent wetlands within the park site are generally highly functional and well-developed systems with minimal intervening management required. The primary focus of management in those areas will be to preserve and maintain the existing high-quality habitats by limiting infrastructure development and use of the area to a level that will not adversely affect riparian processes and by removing invasive species to prevent habitat degradation.

Wetlands within the park site that are not adjacent to a riparian area have been affected by previous timber harvesting. To promote wetland recovery, future management will require stewardship that protects existing processes in the wetlands by allowing them to



recover. In addition, forest practices will be used to encourage development of the structure, characteristics, and species composition of mature wetland systems.

*Stewardship Prescriptions:*

1. Ensure all park activities occurring in or near riparian areas, wetlands, and shoreline zones are consistent with local, state, and federal regulations protecting such areas.
2. Designate and protect vegetated buffer areas along all riparian corridors and wetlands consistent with local, state, and federal regulations.
3. Restore buffer areas disturbed by past activities or future park construction or maintenance activities to an equal or better condition than prior to disturbance.
4. Coordinate riparian stewardship with the Nisqually Indian Tribe, adjacent landowners, and other stakeholders within the watersheds of the Nisqually River, Mashel River, and Ohop Creek. In this way the park will leverage the effectiveness of local initiatives by applying them at the park site's landscape scale.
5. There are small pockets of invasive plant species, such as Scotch broom (*Cytisus scoparius*) and butterfly bush (*Buddleja davidii*), along riparian corridors, often associated with areas having current or past road access and extensive unregulated day use. Prompt removal of these pockets will reduce the opportunity for these species to spread into other areas of the park. The known locations of invasive species are provided in the section on invasive species and pest management found later in this plan.
6. Within the park's rivers and creeks, woody material will generally be allowed to remain. If trees fall into the creek they will improve fish and other animal habitat and will be left unless they are causing flooding in developed park areas. Trees may be placed in the creeks if and where needed to enhance fish habitat, as recommended by a qualified fisheries biologist.
7. Allow no timber harvesting in forested wetlands for at least 5 years. At the end of 5 years, have a qualified forester evaluate the condition of previously harvested forested wetlands to determine whether prescribed thinning or other forest practice would assist in improving stand structure for the purpose of accelerating mature wetland forest character.
8. Where present, remove or improve hydrologic barriers that are adversely affecting wetland hydrologic flows such as roads with no, plugged or undersized culverts; fill, dams or other water control structures; and filled or plugged ditches or drains.
9. Install typical structures such as nest boxes or platforms, perch logs, or brush piles to improve wildlife use of wetlands with seasonal or perennial open water.



### Forest Lands

Stewardship of forest land within the Nisqually-Mashel State Park Site will implement the management recommendations found in the Nisqually Mashel State Park Forest Health Plan (Ettl and Emmons 2008) (Appendix F). The 2008 forest health plan provides a comprehensive analysis of the management actions that will support the long-term health and integrity of the forested areas in the park. Well-planned thinning and re-establishing species diversity in plantation forests, preservation of contiguous tracts of forest, and sighting high-intensity visitor use and development in the youngest and most degraded forests will enhance and protect forest land resources and minimize impacts from park development and visitor use.

The forest health plan recommends no treatments for most stands dominated by hardwood species, and for those stands with trees too small for thinning at this time. For other stands the plan provides specific thinning recommendations and time frames, as well as recommendations for planting species to increase forest species diversity.

The Nisqually-Mashel State Park Site will pursue certification under the Forest Stewardship Council's (FSC) Pacific Coast Standard. The 2008 forest health plan will provide the required planning to obtain this certification. The benefit of forest certification is that it assures the prescribed forestry practices are sustainable, as the FSC standard is broadly accepted as a means of demonstrating sustainable forestry. The forest health plan will be consulted for the specific steps needed to achieve this certification.

#### *Stewardship Prescriptions:*

1. Implement the management recommendations found in the Nisqually Mashel State Park Forest Health Plan (Ettl and Emmons 2008).
2. Implement the management recommendations found in the Nisqually Mashel State Park Forest Health Plan (Ettl and Emmons 2008).
3. Update the forest health plan at least every 5 years with the intention of accelerating the development of older stage forest systems where appropriate, and to maintain or restore healthy, diverse, and sustainable native forest systems today and in the future.
4. During forest harvest entries, implement best management practices that conserve and protect soil productivity, reduce soil compaction, reduce rutting that would impede water flow, maintain water quality, and minimally impact fish and wildlife habitat, and air quality.
5. Actively manage fuels and vegetation, where appropriate, to minimize risk of loss due to wildfire.
6. Act in a timely manner to restore and recover forest land burned by wildfire.
7. Monitor forest conditions to study the effectiveness of management strategies and share the knowledge gained.



8. Promote cooperative forest management strategies with adjacent landowners as needed to achieve forest health objectives.
9. Provide leadership in the management and stewardship of public forestlands in Washington.
10. Maintain and improve the contribution of the Nisqually-Mashel State Park Site forests to global carbon cycles.

#### Power Line Corridors

Power line corridors are very susceptible to colonization by invasive plant species due to repeated soil and vegetation disturbance that occurs from vegetation management, maintenance practices, and corridor use by visitors. Traditional power line corridor management focuses on keeping vegetation in an early-succession stage to minimize the risk of damage to the structural towers and overhead lines. As a consequence, power line corridors through forested ecosystems are thought to fragment the landscape and facilitate the intrusion of undesirable species into natural areas. However, power line corridors also have the potential to create a mixture of different succession stages, enhancing habitat availability for many species that prefer forest edges, and grassland and shrub habitat.

#### *Stewardship Prescriptions:*

1. Facilitate the removal of invasive species by coordinating with Tacoma Power and Bonneville Power Administration (BPA) on management of their easements within the park site. Report as needed to the Pierce and Thurston County noxious weed boards to ensure completion of this task by Tacoma Power and BPA within the next 5 years.
2. Coordinate vegetation management within the power line corridors with Tacoma Power and BPA to create succession variation through corridors that includes a mix of areas dominated by grasses, herbs, shrubs, and small tree species.
3. Where planned, develop clearly signed formal trails allowing only designated uses through power line corridors. This prescription is directed at eliminating informal trails and unauthorized uses, particularly ATV and other vehicle use.
4. Manage vegetation in the power line corridors to retain views of the surrounding mountain ranges.

#### Mashel Prairie

The Mashel Prairie represents one of the last remaining tracts of the South Puget Prairie ecosystem and is unique in that it is an emergent wetland prairie where most remaining prairie habitats are dry land systems. It is the easternmost documented occurrence of emergent wetland prairie habitat. In addition, as mentioned previously, the Mashel Prairie has high cultural significance. Therefore its preservation and restoration is one of the park's top priorities.



The Mashel Prairie is not within the existing park site boundary and remains private property as this plan is published. As a consequence, it was not possible to evaluate the specific condition of the Mashel Prairie. However, general guidance is provided based on limited roadside observations and on the condition of similar habitats in the South Puget Sound region.

The specialized soil conditions of the Mashel Prairie are probably primarily responsible for its maintenance, although fires set by native people have contributed to its character in past centuries, and grazing has also contributed to its condition in more recent history. Construction and improvements to Mashel Prairie Road East have altered the prairie's historic hydrologic regime. Today the Mashel Prairie exhibits growing encroachment of pasture grasses and invasive species, and forest is likely regenerating in its drier areas.

*Stewardship Prescriptions:*

1. Once lands containing the Mashel Prairie are acquired, a thorough inventory will be conducted to identify the extent of the prairie, native, and invasive species present, the existing hydrologic regime, and wildlife use of the area. The inventory data will be used to identify areas in need of rehabilitation. Then interventions will be explored to evaluate their effectiveness in rehabilitating a wetland prairie system such as the Mashel Prairie.
2. Prairie restoration is an ongoing area of study by a number of researchers. A recommended local clearing house for current science-based information on the efficacy of interventions for rehabilitating and retaining prairie habitats is the South Puget Sound Prairie Landscape Working Group ([http://www.southsoundprairies.org/.](http://www.southsoundprairies.org/))
3. Once a baseline inventory is completed along with research on the best rehabilitation methods for the specific site conditions, a rehabilitation and stewardship plan specific to the Mashel Prairie will be developed. Interventions to rehabilitate and retain wetland prairie habitat to be considered will include hydrologic alterations, non-native invasive species removal, use of fire by controlled burns, removal of encroaching forest and shrub species, replanting of native wetland prairie species typical of those found in the area, and traditional plant harvesting.

The Mashel Prairie is of great significance in terms of its place in Native American history in the area and its preservation is of utmost concern. In addition, interpretation of the prairie and its use is a core component of the park's public educational programs.

Cultural Resources

The range of cultural resources in the park connects it to the Salish/Nisqually peoples, early European settlement, agriculture, logging, power generation, and recreational and leisure attractions. Cultural resource management issues include preservation of existing cultural landscapes, historic structures, historic sites, and prehistoric resources to ensure



their integrity for future generations. Restoration of degraded resources may be an option in some cases.

The *Cultural Resources Survey of the Proposed Nisqually-Mashel State Park, Pierce and Thurston Counties, Washington* (Emerson and Ives 2008) provides details of the history of human settlement in the park and vicinity and describes locations of important cultural features within the existing park site that will be protected.

The majority of the park site appears to have a low to medium probability to contain unrecorded cultural resources. However, riverine settings and the Mashel Prairie are considered high probability areas for cultural resources presence (Emerson and Ives 2008.).

*Stewardship Prescriptions:*

1. All Park developments will comply with either section 106 or Governor's Office Executive Order 05-05.
2. Before selecting a site for new park development, a site-specific archaeological survey that includes shovel testing will be completed for the area that will be disturbed.
3. In the event that cultural resources are identified during any construction activities, work will be halted in the immediate vicinity of the find and a professional archeologist will be notified to assess the resource.
4. All identified archeological findings will be reported to Washington State Parks and the Washington State Department of Archaeology and Historic Preservation.
5. A detailed cultural resources protection and preservation plan will be prepared to steward cultural resources.
6. To ensure impacts to cultural resources are avoided, results of any surveys are to be recorded with the Department of Archaeology and Historic Preservation.
7. As property is acquired with historic structures present, such as the Old Milk Barn, an Historic Structures Report will be prepared to make recommendations for rehabilitation and reuse prior to any modification of any historic structures. All rehabilitation of historic structures will adhere to the Secretary of the Interior's Standards for the Treatment of Historic Properties.
8. Those sites that are culturally significant and have been identified by the Master Plan as places to protect, educate, and provide interpretation, (such as Leschi's village, the Shaker Cemetery, and Medicine Springs), and natural resources associated with the cultural resource areas will be managed to support cultural resource interpretation and protection, unless that would result in unacceptable conflicts with protected species or areas of special natural resource concern.



### Scenic Resources

Whenever possible, screening vegetation will be retained and, where needed, will be planted to limit views of developed areas seen from park roads and trails. Overall, the intent is to minimize visitor awareness of service facilities and maximize visitor perception of the forest and river valley setting. However, occasional views of park development are needed to help orient visitors to the facilities of the park.

#### *Stewardship Prescriptions:*

1. Only native tree and shrub species appropriate to the Nisqually-Mashel State Park Site will be planted for screening.
2. In general, where public access is not desired, manage vegetation to increase density and remove openings.
3. Trees and brush will be selectively pruned or removed to retain desired views.
4. Trees may be removed and native grasses and herbaceous species planted in areas near roads, trails, and scenic and interpretive overlooks, where views are needed to help the public recognize access points to park facilities, and where views of natural park features, such as river valleys or cultural sites, need to be retained.
5. Specific areas where views will be retained include:
  - Views of Mount Rainier and other landscape features from the four camp area meadows
  - Views from trails and scenic and interpretative overlooks of the Cascades, Mount Rainier, the bluffs, and rivers below
  - Views from the Observatory
  - Views from the high canopy bridge.

### Trails and Campgrounds

Stewardship of trails and campgrounds begins with good design and layout for the site conditions and expected use levels in different seasons. Good design will minimize the need for ongoing trail maintenance by using construction techniques and materials designed for long term self-sustaining use, and by using on-site materials as much as possible that can simplify needed repairs.

Trails and campgrounds will have surfaces and features that will support planned uses with minimal impact to park infrastructure and to natural systems in the area. Trails will show negligible evidence of soil loss or movement on or adjacent to the trail, and will not impede water flow. Similarly campgrounds will have little or no evidence of soil loss or movement and be surrounded by live, healthy vegetation. Trail and campground design and placement will accommodate naturally occurring plants in the area, recognizing there will be required pruning and potential removal of certain plants over time. Properly designed trails and campgrounds will not adversely affect the naturally occurring flora



and fauna and will require less maintenance and, in the case of trails, minimal rerouting over time by park staff.

There are many trails within the Nisqually-Mashel State Park Site that are leftover routes from timber extraction activities and as such were not really intended for long-term recreational use. Existing trails intended for continued use by park users will be rehabilitated where needed to remove obstructions, improve drainage, and to improve surfaces to accommodate allowed uses. Existing trails not intended for long-term use will be abandoned and the entries closed off from view with berms, rocks, or brush, and screened with vegetation.

Park staff's ability to maintain trails and campgrounds on public lands is limited. Even with good design, trails and campgrounds may become over used as evidenced by trampled and dying vegetation, soil rutting, soil loss, other signs of erosion, trail or camp site widening, and excessive wear on camp facilities. Sometimes even well-designed trails and campgrounds may need to be closed to provide recovery time for surrounding vegetation and needed maintenance.

*Stewardship Prescriptions:*

1. Trail designs will:
  - Allow water to readily sheet off the trail by designing with a 2 percent cross slope, avoiding erosion and rutting.
  - Align trails using the natural topography of the land.
  - Use rolling dips, not waterbars as a water drainage feature.
  - Have a trail grade that does not exceed 5 percent. Exception is existing trail that descends Mashel River Bluff.
2. Where public access is not desired, vegetation will be managed to increase density and remove openings.
3. All trails and campgrounds will be monitored on at least an annual basis to look for signs of overuse and degradation, and the conditions will be documented and kept as a monitoring record. Indications of overuse and degradation include trampled and dying vegetation, soil rutting, soil loss, other signs of erosion, trail or camp site widening, and excessive wear on camp facilities.
4. Informal trails created by users, trails with poor designs, and trails that threaten sensitive resources will generally be closed or relocated and the area rehabilitated or allowed to naturally revegetate.<sup>1</sup>

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<sup>1</sup> There are numerous options for closing undesirable or overused trails; often an incremental approach is warranted. The entrance to a trail to be closed can be roped off, or it may be hidden by raking organic debris such as leaves onto its tread, along with placement of rocks and dead branches. These actions also lesson soil erosion and speed natural recovery. If these actions are ineffective, large rocks can be "ice-berged" (planted deep) at the entrance to informal trails to discourage their use. Logs large enough to deter their removal by visitors can also be placed along the first 10 or more feet of a closed trail.

5. When trails show signs of overuse and degradation, steps will be taken immediately to improve the situation. If the trail can be improved sufficient to remedy the symptoms of overuse and degradation with available resources (funding and staff), the trail will be improved and its condition monitored. Improvements to consider include vegetation trimming, improving tread drainage, or graveling to create a more usable or visually obvious route. However, if improvements cannot be made within a reasonable timeframe, the trail will be closed for a period sufficient to allow for recovery and needed improvements.
6. As a general practice to prevent overuse and degradation of campgrounds, 25 percent of the park's camping areas will be closed to public use each year. In addition some camp sites may be opened to the public later in the year than others (beginning in June after the early growing season) to allow vegetation to better establish prior to use. The need for campground closures will be evaluated by park staff on an annual basis based on the monitored conditions report for each campground. Seasonal or annual closures will be used to prevent habitat loss and infrastructure degradation before costly repairs and improvements are required.
7. Campgrounds and trails will be signed as appropriate to inform users on park stewardship including the protection of campsite and trailside vegetation, proper recycling of waste, efficient water use, and protection of wildlife.

#### Tree Risk Management<sup>2</sup>

Stewardship will include implementing an active hazard tree management program, which ensures a safe recreational experience for park visitors. The Washington State Parks and Recreation Commission (WSPRC) policy on tree risk management is to plant tree species suitable for park use; prune young trees to improve structure and health; and sustain mature trees by minimizing physical and environmental impacts to them and by pruning structural defects to increase integrity and longevity, and to minimize risk<sup>3</sup>.

It is WSPRC policy to proactively identify and mitigate high-risk trees to protect staff, visitors, and park resources in developed areas of the park system. It is a goal of WSPRC to reduce the risks trees pose to public and staff safety to a level that meets professionally recognized standards and demonstrates reasonable care.

#### *Stewardship Prescriptions:*

1. Trees in landscapes classified Recreation or Heritage, and in other select high-use areas of the park system, will be assessed on an annual basis by a professional forester, certified arborist, or agency staff trained in agency-approved tree risk rating and abatement techniques, for their risk of injury to persons or property.

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<sup>2</sup> This section is based on DRAFT policy language slated for incorporation into the Washington State Parks and Recreation Commission policy 73-04-1 PROTECTING WASHINGTON STATE PARKS NATURAL RESOURCES.

<sup>3</sup> The approaches outlined in this sentence pertain, in most instances, to developed areas of the park site.



2. For trees identified as emergency trees<sup>4</sup>, the park manager or designee trained in tree risk rating and abatement techniques as prescribed by the WSPRC Arboriculture-Forestry Manager is authorized to immediately close the target area and, where the target cannot be relocated, to cut or remove the emergency tree.
3. For non-emergency trees, the findings of these assessments will be recorded on a tree risk evaluation form and submitted to the WSPRC Arboriculture-Forestry Manager on or before year-end.
4. Trees requiring maintenance activities will be identified and prioritized by the WSPRC Arboriculture-Forestry Manager or designee, based on the annual assessments produced by the park staff, and treated to the capacity of the WSPRC Natural Resource Specialists crews and/or other existing funding sources.

### Park Use Areas

The Nisqually-Mashel State Park Site has four use areas called: Central Plateau, East Mashel Plateau, South Bank of the Nisqually River, and the River and Creek Valleys.

Each park site use area is characterized by a distinct set of desired conditions, uses, and goals, requiring specific stewardship prescriptions. The conditions in each area and the prescriptions for stewardship are described in the following subsections.

#### ***Central Plateau***

The Central Plateau is the primary and central park land use and development area. It is a key area for park activities and programs. The Central Plateau includes the Park Entry and Welcome Center, the Village Center, a Day Use and Group Picnic Area, Camping Areas, Maintenance and Infrastructure Facilities, the Ohop Equestrian Center, and the People's Center.

The Central Plateau exhibits various stages of forest succession and regeneration. Some areas reflect a plantation-style forest management strategy and consist of extremely dense young forest. Other areas are newly cut, characterized by only small trees and shrubs, and allow views of the surrounding landscape, including Mount Rainier. Stewardship in the Central Plateau will focus on protecting visitor's experience and accommodation, preventing degradation and overuse of park resources, and preventing the introduction and spread of invasive species.

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<sup>4</sup> From 235-28-010 WAC: Emergency trees means any tree that has already failed (cracked, tipped, diseased, failed or standing dead) or in the judgment of a professional forester, certified arborist, or park staff member trained in tree risk rating and abatement techniques approved by the agency, and which due to its location, poses an imminent threat to a target. Imminent means likely to occur at any moment, and target means a structure, facility, or person that has the potential to be hit or impacted by a falling tree or tree part.



*Stewardship Prescriptions:*

1. For all areas within the Central Plateau, implement the forest management recommendations found in the Nisqually Mashel State Park Forest Health Plan for the area (Ettl and Emmons 2008).
2. Stewardship in all areas of the Central Plateau will protect the visitor's experience and accommodation, but park resources will be managed to prevent overuse.
3. The Central Plateau will experience the highest level of use of all the areas in the park and, as a result, the proliferation, spread, and translocation of invasive species will likely be a serious issue. A noxious weed survey will be completed annually to detect and map and update locations of invasive and noxious weed species. A plan for control and removal of infestations will be prepared and implemented.
4. Meadow areas such as the Great Meadow will be maintained as meadow and the forest edge thinned as needed to allow views into the surrounding forest and to Mount Rainier.
5. In areas where retaining or facilitating views is a priority, such as near the summit of the plateau, the Observatory, and the camping meadows, open-canopy forest or shrub-dominated conditions will be maintained by selective removal of vegetation.

***East Mashel Plateau***

The East Mashel Plateau is currently owned by the UW Center for Sustainable Forestry and is located between the east bank of the Mashel River and SR 7. The East Mashel Plateau supports three primary land use areas: a backcountry horse camp, camping areas for recreational vehicles (RVs) and tents, and a backcountry bike challenge course. These areas are accessed from an entry off SR 7 and managed through the Welcome Center and vehicle control nodes. Trails and access roadways connect eastside park users to the Mashel River bluff, bridges, and confluence areas. This area provides immediate access to the nearby UW Center for Sustainable Forestry conference facilities, forested areas, and regional trails.

Focus for park stewardship in this area will be on forest management, and on preventing degradation and overuse of the campgrounds and multi-use trail network that allows for hiking and biking.

*Stewardship Prescriptions:*

1. Once the East Mashel Plateau is acquired, a forest health plan will be prepared to provide guidance on sustainable forestry practices to improve forest health and biodiversity.
2. Trails and campgrounds will be monitored on at least an annual basis to look for signs of overuse and degradation and the condition documented and kept as a monitoring record. Remedial actions will implement the prescriptions provided in the Trails and Campgrounds section of this plan.



### ***South Bank of the Nisqually River***

The South Bank of the Nisqually River Area supports the Nisqually Tribe Management Area and Traditional Knowledge Camp. This area is accessed by the pedestrian trail network, including two bridges, one high bridge above the confluence of Ohop Creek and the Nisqually River, and one low bridge over the Nisqually River near the Mashel River confluence. Connections to future Thurston County regional trails and forest lands are planned.

This area is characterized by generally young forest (ranging up to 90 years) and some mature forest located on a terrace on the south side of the Nisqually River. Although the forest is generally young, the area has a number of plant associations that are rare or uncommon in Washington State (LYRA Biological 2006). Management measures will need to ensure that impacts on those areas are minimized.

#### ***Stewardship Prescriptions:***

1. Upland forests located within the South Bank of the Nisqually River area that are included in the 2008 forest health plan (Ettl and Emmons 2008) will be managed consistent with its recommendations.
2. As additional areas of the South Bank of the Nisqually River are acquired, a forest health plan will be prepared to provide guidance on sustainable forestry practices to improve forest health and biodiversity for those areas.
3. Only trails will be allowed within the mature, high-quality forest in the vicinity of the Traditional Knowledge Camp.
4. Camping areas and trails will be signed to inform users that activities are to conform to Leave No Trace principles.<sup>5</sup>

### ***River and Creek Valleys***

The River and Creek Valleys consists of the riparian areas and steep bluffs associated with the Nisqually River, the Mashel River, and Ohop Creek. The area is dominated by sensitive or important habitat types and their buffers, as well as scenic areas that are crucial to preserving the desired visual landscape of the park. Emphasis for stewardship of the River and Creek Valleys will be fisheries protection, removal of invasive plant species, protection of existing resources, protection of the important role the areas play in providing wildlife corridors and resource linkages, and retention of the aesthetics of a natural landscape. Preserving the integrity of these areas is crucial to the park site's ability to maintain exceptional wildlife habitat, therefore public access will be controlled to prevent disturbance to fish and wildlife use of the area.

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<sup>5</sup> Leave No Trace is a national program that promotes responsible outdoor recreation. The curriculum and wilderness skills training courses are taught through a partnership with the National Outdoor Leadership School. For more information, visit the program website at [www.lnt.org](http://www.lnt.org) or call 1-800-332-4100.



The River and Creek Valleys provide high-quality habitat for a variety of wildlife species, such as state and federally listed fish, elk, deer, bear, cougar, and a wide variety of bird species. To prevent adverse impacts on wildlife, use of these areas will be highly controlled, both in terms of access locations and timing (season). For example, access to the Mashel River near its confluence with the Nisqually River via the restored trail will be seasonally restricted to prevent impacts on steelhead trout and Chinook salmon spawning areas.

*Stewardship Prescriptions:*

1. The bluffs above the Nisqually and Mashel rivers, although quite scenic, pose a public safety concern due to their extremely steep slopes and high erodibility. Consequently, access to these areas will be controlled, with only three points of access via the proposed elevated “high” bridges over the Mashel River (two) and Nisqually River (one), five Mashel River overlooks and two Nisqually River overlooks. Otherwise, trail placement and design will prevent the use of the bluff areas by visitors, ensuring public safety and preservation of those unique landforms and the wildlife that use them.
2. The area includes highly valued and critical spawning habitat for Chinook salmon and steelhead trout, and is considered to be one of the most important areas for salmon recovery in the Nisqually River Watershed. Therefore any activities planned for this use area will be consistent with local planning for salmon recovery in the Nisqually and Mashel rivers and Ohop Creek.
3. Public access to river shorelines of the park site will be controlled to prevent disturbance of spawning Chinook salmon and steelhead trout during their respective spawning periods. Spawning locations and periods for these species will be obtained from the Nisqually Indian Tribe Natural Resources Department Salmon Recovery Program (web site: <http://www.nisqually-nsn.gov/salmonrecovery.html>.)
4. The existing Mashel River bridge is likely an obstruction to river geomorphic processes as it lies within the river’s channel migration zone. The obstruction may be affecting fish habitat. When improvements are made to the Mashel River Bridge, this issue will be evaluated and steps taken to mitigate the obstruction to the extent feasible.
5. The road leading to the lower bridge contributes sediment to the river in periods of heavy rainfall. Steps will be taken to evaluate the situation, and short-term and long-term remedial plans for stopping the sediment flow will be developed and implemented.
6. Because of the critical functions of riparian and other wetlands within this water-dominated landscape, wetland preservation is required for the maintenance of a healthy ecosystem in the park. Wetlands are sensitive to trampling and other physical perturbations, and soils and plants in wetland habitats often cannot recover from



disturbance impacts. To minimize the disturbance of wetlands, park infrastructure and trails will be located outside of wetland areas.

7. When access to wetlands is considered necessary, it will be facilitated using boardwalk trails. For example, this approach may be implemented on the proposed trails paralleling the Ohop Valley on the west side of the park and in other areas where trails may encroach on wetland areas.
8. The condition of riparian and wetland habitats and their buffers will be monitored each year to look for disturbances such as trampled vegetation and informal trails. If disturbances are observed, corrective steps will be taken to prevent further access to the area. Habitat restoration will be implemented where needed to restore ecological functions and prevent the spread of invasive species.
9. Tree fall material will remain where it falls in the River and Creek Valleys use area. Trees may be placed in the use area if and where needed to enhance fish habitat, as recommended by a qualified fisheries biologist.
10. No timber harvesting will be allowed in riparian wetlands located in the floodplain and channel migration zones of the Nisqually River, Mashel River or Ohop Creek.
11. Interpretive signage will be used when possible to inform visitors about the benefits the varied and important habitats provide in this use area and the role they play in the park's landscape.
12. Upland forests located within this area will be managed consistent with the recommendations in the Nisqually-Mashel forest health plan (Ettl and Emmons 2008).
13. In the River and Creek Valleys area, as well as other areas of the park site, invasive species pose a threat to native plant communities and may prevent habitats from achieving their full ecological potential. An invasive species management plan will be implemented as part of park operations. In this area, removal of the Scotch broom (*Cytisus scoparius*) population at the confluence of the Nisqually River and Ohop Creek and removal of purple loosestrife (*Lythrum salicaria*) and butterfly bush (*Buddleja davidii*) from the Nisqually and Mashel River floodplains will be prioritized for weed removal and plant community restoration.
14. Trails will be signed to inform users that activities are to conform to Leave No Trace principles.

### Invasive Species and Pest Management

Control of invasive species and pests will be one of the most significant land management responsibilities at the Nisqually-Mashel State Park Site in order to establish and maintain high-quality habitat in the park. Natural areas are dynamic ecosystems that respond to processes of disturbance and succession, including fluctuating insect and plant



populations. In general, such processes will be allowed to occur with minimal intervention. However, strategies to suppress or remove the threat of invasive and noxious weed species or insect pests will be a part of routine maintenance.

The findings of LYRA Biological (2006), corroborated by observations of Herrera during a site visit in 2008, indicate that invasive plant species are common in the park in disturbed areas, especially in previously logged areas.

Given the extent of observed invasive species infestations, park site areas will be inventoried specifically for invasive species populations and an Integrated Pest Management (IPM) strategy (as required by the Washington State Park Sustainability Plan) will be adopted to address the most pressing weed issues (Revised Code of Washington, Section 17.15.030). IPM is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. That information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment. IPM programs work to monitor for pests and identify them accurately, so that appropriate control decisions can be made in conjunction with action thresholds.

The IPM approach embodies effective planning, monitoring, and prioritization of adaptive management techniques, with a level of effort dictated by the species present and the severity of the infestation.

Table 4 shows weed and pest action thresholds that apply to weeds or pests that may be found in the Nisqually-Mashel State Park Site. Noxious weeds are plant species that have been designated for removal or control by Pierce or Thurston counties, or Washington State because they have been identified as injurious to agricultural and/or horticultural crops, native plant communities, humans and/or livestock. Invasive plants are non-native or exotic species that are aggressive colonizers and tend to become monocultures if not managed. Exotic species are non-native species that are not expected to be aggressive colonizers but should be monitored and removed if problems arise.





**Table 4. Weed and pest action thresholds.**

Weed or Pest	Action Threshold
Class A noxious weeds	Will not be tolerated and will be removed when found.
Class B and C noxious weeds	Will not be tolerated and will be controlled or removed when found.
Invasive plants	These species represent a threat to biodiversity and will be controlled in conjunction with ecosystem restoration efforts in these environments.
Exotics	Exotics (non-native species) will be considered habitat and as such will be tolerated except where their presence presents a threat to a particularly valuable landscape asset such as a riparian area or floodplain, a rare plant community or a heritage tree.
Insects	<p>Insects that pose a risk to landscape health (such as tent caterpillars), may be tolerated or controlled based on the degree of damage and level of long-term risk to ecosystem health.</p> <p>Insects that pose a risk to public health and safety (such as hornets) may be controlled or suppressed only in circumstances where they are located in close proximity to human activity. Mosquito management will be performed according to Pierce County’s West Nile Virus Response Plan (<a href="https://wastefreegifts.org/pc/services/home/environ/water/wq/main.htm">https://wastefreegifts.org/pc/services/home/environ/water/wq/main.htm</a>)</p>

Annual monitoring of park use areas and areas formerly and currently infested by weeds will occur to detect any new introductions and to document the status of existing populations. The initial inventory and monitoring efforts are to be followed by development and implementation of treatment prescriptions based on the most effective eradication techniques for the particular invasive species present, the severity of the infestation, and the site conditions. Treatment methods will likely evolve over time with changes in invasive species population characteristics and weed control technologies.

Noxious weeds and invasive plant species known to be present in the Nisqually-Mashel State Park Site are listed in Table 5 along with known locations and removal priorities.

*Stewardship Prescriptions:*

1. Park site areas scheduled for development will be inventoried specifically for invasive species and their removal and control included in an IPM plan.
2. An invasive species monitoring program will be included in the IPM plan.
3. All park use areas will be monitored annually for the presence of invasive species. The highest priority areas for monitoring will be areas adjacent to trails, roads, and campgrounds. Other areas to be monitored include all high use areas, and known infestations.
4. Treatments to eliminate invasive species will be intensive and provide for removal of all individuals in as large an area as funding will allow.



5. Intensive, repeated treatments to smaller areas are preferred over low-level treatments across large areas to bring problem species under control.
6. Invasive species located within park site areas scheduled for development will be removed prior to site development. Measures preventing further spread will be taken, such as requiring that operators maintain clean equipment throughout the process with certain areas dedicated for removing material (i.e., areas to wash tires before entry).
7. Current recommended removal and control methods for each species will be obtained from the Pierce County Noxious Weed Program (web site: <http://piercecountywweedboard.wsu.edu/>) and an implementation plan prepared for each removal and control area.
8. Forest practices operations will be designed to minimize the entry and spread of invasive species. Operators will maintain clean equipment throughout the process with certain areas dedicated for removing material.
9. Forest thinning activities will proceed in concert with efforts to remove and control invasive species on these sites.



**Table 5. Noxious and weed plant species known to be present on the Nisqually-Mashel State Park Site**

Plant Name	Scientific Name	Washington State Class or Type	Known Locations	Removal Priority <sup>1</sup>
Brownray knapweed	<i>Centaurea jacea</i>	Class B	Floodplains of Nisqually and Mashel rivers	High
Bull thistle	<i>Cirsium vulgare</i>	Class C	Agricultural and disturbed areas	Medium
Butterfly bush	<i>Buddleja davidii</i>	Class B	Banks of Nisqually and Mashel Rivers	High
Canada thistle	<i>Cirsium arvense</i>	Class C	Very young forest plantations between Mashel Prairie Road and the Northwest park boundary (LYRA polygons 7 and 8)	Medium
Common tansy	<i>Tanacetum vulgare</i>	Class C	Agricultural and disturbed areas	Medium
Curly dock	<i>Rumex crispus</i>	Exotic	Banks of Nisqually and Mashel Rivers	Low
English ivy	<i>Hedera helix</i>	Class C	Near Nisqually River (LYRA polygon 18)	High
Evergreen blackberry	<i>Rubus laciniatus</i>	Invasive plant	River edges, power line corridors (LYRA polygons 12 and 13), northwest of Nisqually-Mashel confluence, disturbed areas and pastures (LYRA polygons 15, 17, and 46)	High
Flat pea	<i>Lathyrus sylvestris</i>	Exotic	Dominating herb layer in area near Nisqually River (LYRA Polygon 42)	Low
Hairy catsear	<i>Hypochaeris radicata</i>	Class C	Young forests, agricultural and disturbed areas	Medium
Herb Robert	<i>Geranium robertianum</i>	Class B	Widespread in understory of some mature canyon forest habitat and river benches; also along roads	Medium

Plant Name	Scientific Name	Washington State Class or Type	Known Locations	Removal Priority <sup>1</sup>
Himalayan blackberry	<i>Rubus discolor</i>	Invasive plant	River edges, power line corridors (LYRA polygons 12 and 13), northwest of Nisqually-Mashel confluence, disturbed areas and pastures (LYRA polygons 15, 17, and 46)	High
Old-man-in-the-spring	<i>Scenecio vulgaris</i>	Class C	Agricultural and disturbed areas	Medium
Orchardgrass	<i>Dactylis glomerata</i>	Exotic	Banks of Nisqually and Mashel rivers	Low
Oxeye daisy	<i>Leucanthemum vulgare</i>	Class B	Young forests, agricultural and disturbed areas	Medium
Purple loosestrife	<i>Lythrum salicaria</i>	Class B	Floodplains of Nisqually and Mashel Rivers	High
Queen Anne's lace	<i>Daucus carota</i>	Class B	Young forests, agricultural and disturbed areas	Medium
Reed canarygrass	<i>Phalaris arundinacea</i>	Class C	Banks of Nisqually and Mashel Rivers and wetlands, northwest of Nisqually-Mashel confluence	High
Scotch broom	<i>Cytisus scoparius</i>	Class B	Along road corridors and very young forest plantations between Mashel Prairie Road and the Northwest park boundary (LYRA polygons 7 and 8), also found at confluence of Nisqually and Mashel Rivers.	High
St. John's wort	<i>Hypericum perforatum</i>	Class C	Upland flats between Nisqually River and Ohop Creek drainages	Medium

<sup>1</sup> Removal priority is based on the Action Thresholds provided in Table 4 and the risk to the known resource(s) affected. Removal priorities will change over time as existing infestations are removed, and new species or locations identified. This table will be updated as appropriate.

10. Park staff will coordinate with the Nisqually River Cooperative Agreement to control invasive species in the Nisqually River Basin. Sean MacDougal<sup>6</sup> is heading up this effort and coordination has begun around the invasive knotweeds (*Polygonum* spp.) that have been found along the Nisqually River above Alder Dam.
11. If knotweeds are observed within the park site, they will be removed as part of an IPM plan at the earliest opportunity.

### Adaptive Management

Stewardship will be based on the principles of adaptive management. Adaptive management occurs when management actions are quantified and the conditions are evaluated both before and after the management action is implemented; the results of the evaluation are then used to refine the next round of management actions. Adaptive management actively incorporates feedback and learning into park management in order to improve park stewardship.

Another way to view adaptive management is that it will be a process of informed trial and error, where remedial tactics are tried, the degree of success or failure recorded, and the information is used to better prescribe future remedial actions.

There are three fundamental components required for adaptive management: (1) baseline measure of condition, (2) monitoring and evaluation of the condition, and (3) selection of the next step (no action or remedial).

Information on the baseline measure of conditions found at the Nisqually-Mashel State Park Site is available from a number of studies completed for the park site Master Plan including a cultural resources survey (Emerson and Ives 2008), forest health plan (Ettl and Emmons 2008), rare plant survey (LYRA Biological 2006), and environmental constraints report (Herrera 2008). Those existing studies will be used to the extent of their coverage and augmented as needed where information is lacking.

Monitoring and evaluation of park conditions will be a fundamental task assigned to stewardship activities. The conditions of natural resources and park infrastructure will be monitored on at least an annual basis and a record kept that will allow for an assessment of whether conditions are stable, worsening, or improving.

Depending on the outcome of monitoring and evaluation, selection of the next step will be a choice to take no action, continue current actions, or to take remedial actions. In general, monitoring of resources that indicates conditions are stable or improving will warrant a response that is either to take no action or continue current actions. Monitoring indicating a degrading condition will trigger the implementation of remedial actions intended to stop degradation and improve long-term resource conditions. Some remedial actions have been anticipated and are prescribed in this plan; however, other

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<sup>6</sup> Pierce County Noxious Weed Control Program 1420 East 112th Street Tacoma, WA 98445  
(253) 798-6802

unanticipated issues will require park staff to research and evaluate remedial alternatives, select the best indicated actions, and follow up with appropriate monitoring for remedial action evaluation.

*Stewardship Prescriptions:*

1. Adaptive management will be used to ensure the protection of park resources, including existing high-quality habitats, wildlife use of the park, places of cultural significance, and park infrastructure.
2. A monitoring program will build on surveys of existing conditions to document a baseline from which to measure change and be augmented by other studies as needed.
3. Indicators will be selected for each resource area (habitat condition, trail condition, invasive species presence) to effectively measure changes in the resource.
4. The monitoring program will consider the costs and logistics of monitoring protocols in order to implement a program that can be repeated with a frequency that provides a sufficient gauge of resource condition.
5. Indications of degraded resources will trigger the identification of remedial actions that will be taken in response, such as decreasing visitor use to reduce impacts and rehabilitating the degraded resource.

General guidelines for monitoring ecological and cultural resources, as well as the impacts due to public access and use, are provided in the following subsections. These will provide a starting point for developing a monitoring plan and will be revised and expanded as needed to improve park monitoring.

***Monitoring for Ecological Resources***

High-priority ecological features in the park will be monitored to evaluate stewardship policies and resource health. The following methods are recommended and will be augmented as necessary:

- Photo-monitoring locations (permanent locations in the park from which repeated photographs of the landscape can be taken) will be established in priority areas to provide a visual record of trends and changes over time. Photo-monitoring can be used to document important views and landscape characteristics.
- Vegetation condition will be monitored in areas of concern such as areas adjacent to trails or campsites, rare plant associations, disturbed areas, areas with known noxious weed infestations, and high use areas.
- Wildlife use will be monitored to the extent necessary to ensure protection of migration corridors, and specialized breeding and feeding areas such as nesting trees or open water wetlands.
- Fish use will be monitored to the extent necessary to ensure protection of spawning times and areas.



### ***Monitoring for Cultural Resources***

High-priority cultural resources are monitored to help evaluate the effectiveness of stewardship policies. An archaeological and cultural resources inventory of the park has been conducted (Emerson and Ives 2008). It provides some baseline information about conditions against which to measure impacts on these features.

- Monitoring of cultural resources will consist of annual staff inspections which will include photo-monitoring of cultural resource areas.

### ***Monitoring for Trails and Campgrounds***

Monitoring the level of public use and the impact of public uses on the park's resources is a critical element of park stewardship. To help determine appropriate use levels, the park will monitor the condition of public use areas annually and also rely on feedback from volunteer stewards, interested citizens, and neighbors.

- Trails and campgrounds will be visited and indications of overuse and degradation documented. Indicators include trampled and dying vegetation, soil rutting, soil loss, other signs of erosion, trail or camp site widening, and excessive wear on camp facilities.
- Car counters and trail monitors will be used to track the number of people using portions of the park over time in areas where overuse is anticipated or observed. This information would be used to anticipate resource impacts in advance of problem situations.
- A permit system will be used to track or limit use levels in areas where public access is severely affecting park resources.
- Photo-monitoring will be used to assist in the evaluation of public use impacts at locations selected to be permanent photo monitoring stations.

### **Regulatory Context**

Stewardship of the Nisqually-Mashel State Park Site will comply with all federal, state, and county regulations. Activities within the park are subject to a number of federal, state, and county regulations. Rivers, streams, and wetlands are regulated under the jurisdiction of the U.S. Army Corps of Engineers, the Washington State Department of Ecology, and Pierce and Thurston counties. The counties also prescribe the preservation of upland buffers around these features.

Activities that affect protected species and habitats within the park site will require approval from one or more of the following agencies: the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Nisqually Indian Tribe, the Washington State Department of Fish and Wildlife, and the Washington State Department of Natural Resources. Forestry activities are regulated under the Washington Forest Practices Act as administered by the Washington State Department of Natural Resources. All land



clearing and development activities are regulated by the county permitting and planning processes.

Most of the Nisqually-Mashel State Park Site, encompassing all land north of the Nisqually River, is in Pierce County and is subject to Pierce County regulations. Park land south of the Nisqually River is in Thurston County and subject to Thurston County regulations. Both Pierce and Thurston counties regulate specific environmental features that are classified as critical areas. Critical areas in both counties include wetlands, streams, fish and wildlife habitat conservation areas, and geologic/landslide hazards, which include steep slopes and lahars. The locations and regulatory requirements related to these areas are detailed in the environmental constraints report for the Nisqually-Mashel State Park Site (Herrera 2008).

### Park and Visitor Safety

An emergency fire plan will be developed in coordination with local fire districts and other knowledgeable parties. The plan will consider likely scenarios in the event of a fire, identify environmental and public safety goals, and outline protective strategies. The plan will discuss fire hazards, describe fuel sources in different parts of the park, identify access and base locations for emergency vehicles and aircraft and water sources for firefighting, and provide protocols for communication and emergency notification.

Portions of the Nisqually-Mashel State Park Site are within the potential lahar inundation zone of Mount Rainier.<sup>7</sup> Areas within the park that are at risk in the event of a lahar include the Nisqually River valley; the lower reaches of Ohop Creek and the Mashel River, near their confluence with the Nisqually River; and the adjacent river valleys. A plan to safely and quickly evacuate park users will be developed and implemented to reduce the risk of injury and death from a lahar. Successful evacuation will depend on early detection of an approaching lahar, a clear warning system, and public understanding of the hazard and how to respond. Efforts of public agencies are ongoing along major river valleys, including the Nisqually River valley, with headwaters on Mt. Rainier to develop and implement effective lahar warning.

Careful study of the deposits in the large valleys that drain Mount Rainier shows that, over the past 10,000 years, Mount Rainier has been the source of numerous lahars (volcanic debris flows) that buried now densely populated areas as far as 60 miles from the volcano (USGS 2000). Lahars originating on the steep flanks of Mount Rainier are expected to flow into the park's river channels and valleys. Evidence from historical deposits combined with observations of modern debris flows suggest that past lahars traveled at speeds as great as 40 to 50 miles per hour at depths of 100 feet or more in the confined parts of the valleys but slowed and thinned in the more distant, wider parts.

<sup>7</sup> A *lahar* is a flowing mixture of water and sediment that contains such a high concentration of rock debris that it looks and behaves like flowing wet concrete. Lahars are capable of destroying buildings, bridges, and other man-made structures by battering, dislodgement, and burial.



During the past few thousand years, lahars that spanned valley floors down into the now densely populated Puget lowland have recurred, on average, at least once every 500 to 1,000 years. There is every reason to expect that future lahars from Mount Rainier will be similar to those of past lahars in terms of their behavior and frequency (USGS 2000).

Lahars seek valley bottoms; therefore, in many cases, it's possible to escape a lahar by quickly climbing or driving upward from the valley. Pierce County has estimated the travel time for a large lahar from Mount Rainier to reach the river valleys of Nisqually-Mashel State Park Site to be approximately 1.5 hours from detection.

### Park Stewardship and Climate Change

Estimates of the magnitude of climate change that has occurred in recent years and is projected for the future remain uncertain. However, there is ample scientific evidence that climate change is currently affecting and will have significant future impacts on terrestrial and aquatic ecosystems throughout the Pacific Northwest. Key climate factors that will affect stewardship of the Nisqually-Mashel State Park Site are increasing average annual temperatures, seasonal and annual changes in precipitation patterns, and increasing frequency of extreme weather events.

Stewardship planning for climate change is needed if the park is to successfully adapt to future environmental conditions. The following are general recommendations that are suggested on which to base stewardship planning in the face of climate change:

- Recognize that past ecosystem conditions in the park may no longer be a dependable guide to future conditions in the park.
- Take actions to increase the ability of the park's infrastructure and ecosystems to adapt to the effects of climate change.
- Expect the unexpected and be ready and able to adapt to changing conditions.

During the twentieth century, the Pacific Northwest experienced a climatic temperature increase of 0.8 degrees Celsius (°C). Using results from eight climate models, a further increase of 0.5 to 2.5°C (median 1.5°C) by the 2020s is projected, with another 1.5 to 3.2°C (median 2.3°C) by the 2040s. The models also project that the increase in temperature would result in an increase in precipitation, except in the summer. The foremost impact of a warming climate on the Nisqually-Mashel State Park Site will be a reduction in the regional snowpack, which currently supplies the park with water for ecosystem processes and human uses, especially during the dry summers (Mote et al. 2003).

With decreased snowpack and earlier snowmelt, the summer low flows in the park site's rivers and streams are likely to be further reduced, while winter stream flows would likely rise, altering the timing of freshwater discharges to wetlands and ultimately Puget Sound. If winter precipitation increases, as the models suggest, the risk of flooding in the park site's watersheds would be compounded (Mote et al. 2003).



Lower summer flows and warming waters may put further negative pressures on salmon and other fish that use the park site's rivers and streams in the summer.

Warmer water temperature would potentially put many species at risk. Algae and plankton, the foundation of the food web within the park's wetlands, rivers, and streams, are sensitive to temperature change. Temperature-driven shifts in plankton could ripple through the food web, changing the composition of the invertebrate, fish, and mammal communities inhabiting the park site.

The park site's ecosystems are also sensitive to temperature variations between day and night and between seasons. The frequency and severity of extreme cold conditions, which serve to control certain pests but also can damage certain plants, can also be important. Changes in all of these parameters have been observed in the Pacific Northwest (Easterling et al. 2000).

Tree mortality may already be increasing in the Nisqually-Mashel State Park Site. The rate of tree death in older coniferous forests in western Washington has doubled over the last 17 years. Continued reductions in snowpack and prolonged drought help many insects and tree diseases to flourish, which can contribute to increased tree mortality (van Mantgem et al. 2009). That trend could fundamentally restructure the forests within the Nisqually-Mashel State Park Site, leading to increased forest fragmentation and increased fire danger from fuel-loaded dead trees and overcrowded immature tree species that would colonize disturbed forests and valleys.

Based on such documented trends, climate change will affect ecosystem processes within the Nisqually-Mashel State Park Site by affecting forest development, wetland functions and values, river and stream hydrogeomorphic processes, and the composition of flora and fauna communities. Forest development will be affected by increased mortality of tree species that are more sensitive to temperature changes and drought. Freshwater wetlands will be affected principally by increased water temperatures, increased evaporation, and seasonal and annual changes in precipitation patterns. Rivers, creeks, and river valleys will be subject to increased flooding and more frequent and extreme storm events. Northerly shifts in flora and fauna communities are expected to continue, along with the associated concerns about the increased presence of non-native, invasive species.

Based on these expected future ecosystem trends due to climate change, the following guidance for park stewardship is provided:

- Monitor park site ecosystems for ongoing and long-term change.
- Site park development outside of river channel migration zones and outside of aquatic resources and their regulated buffers.
- Where park development is planned for areas that may be vulnerable to unpredicted weather events, include emergency procedures and facility life cycle planning into the planning process.

- To the extent possible, provide ample room for rivers, creeks, and wetlands to migrate.
- Prevent fragmentation of forested areas and wetland, stream, and river systems.
- Protect wildlife corridors.
- Implement the management recommendations found in the Nisqually Mashel State Park Forest Health Plan (Ettl and Emmons 2008).
- Consider the impact of proposed park activities on carbon stores to minimize the park's carbon footprint and assist in minimizing the effects of climate change.

By including climate change in park stewardship planning, Washington State Parks can build the capacity required to prepare for and cope with both expected and unexpected climate-induced impacts.

### Stewardship Coordination

The Nisqually-Mashel State Park Site is a product of the collaboration of a suite of stakeholders, including interested community groups and public agencies. The engagement of these groups in park site development and operation, as exemplified by the park planning process, will be critical to the long-term success of the Nisqually-Mashel State Park.

### Stakeholder Participation

Many of the stakeholders that have been involved in the formation of the Nisqually-Mashel State Park Site may play an important role in the stewardship of this area. Their contributions may result from passive participation (i.e., land contributions through donation or sales), active participation such as assisting with resource management, or both.

In order to achieve the goals and objectives for the park, Washington State Parks has proposed a long-term park boundary that includes many of the surrounding properties that are not currently owned by Washington State Parks. Therefore, coordination with some of the stakeholders will focus on approaches to land acquisition, while coordination with others will focus on ongoing collaboration and involvement.

Some of the most active stakeholder groups currently identified to play a significant role in park development is described in the following subsections. It is recommended that Washington State Parks pursue formalizing agreements with these potential partner organizations such as memoranda of understanding.

### *Nisqually River Council*

The Nisqually River Council consists of governmental and nongovernmental stakeholders and represents a wide variety of public and private interests. The council plays a coordination role in watershed planning and is in charge of implementing the



*Nisqually Watershed Stewardship Plan.* Washington State Parks will coordinate closely with the council to make sure that the park site management and proposed activities align with watershed-level goals and objectives, and State Parks representatives will participate in the Nisqually River Council advisory committees.

### ***Nisqually Indian Tribe***

The Nisqually Indian Tribe has played an essential role in planning efforts for the Nisqually-Mashel State Park Site, and it will continue to play a crucial role through management and stewardship participation after the state park is established. A significant portion of the main park area (Central Plateau) will likely be owned and operated by the Tribe for the development of the People's Center. A portion of the park south of the Nisqually River will also likely be managed by the Tribe as a Traditional Knowledge Camp. The development of a strong volunteer program through the Tribe will provide critical contributions to park stewardship, such as trail maintenance, invasive species management, and cultural resource interpretation. In short, ongoing participation in and guidance from the Nisqually Indian Tribe related to park development, interpretive activities, and stewardship of cultural and natural resources are imperative to achieving the objectives for the park.

### ***Nisqually Land Trust***

The Nisqually Land Trust has been instrumental in the Nisqually-Mashel State Park Site's successful property acquisitions to date. The trust, which also owns property north and west of the park, has expressed a willingness to enter into an agreement that would allow that land to be managed as part of the park within its Long-Term Park Boundary. Additionally, the Nisqually Land Trust could potentially purchase a portion of the land between the current park site boundary and Ohop Creek.

### ***Manke Timber***

The park site's Long-Term Park Boundary and a significant portion of its goals and objectives hinge on the acquisition of the Manke Timber property that occupies a significant portion of the park site's Central Plateau just north of the Nisqually River.

### ***University of Washington Center for Sustainable Forestry at Pack Forest***

The UW Center for Sustainable Forestry has played an important role in the acquisitions of property and logging rights, and it has also been generous in allowing the use of its facilities for meetings and workshops during the park planning process. It has also expressed interest in partnering on forest management within the park site, and the site's long-term park boundary includes portions of the Center's forest (located on the east side of the Mashel River). There is potential for staff to live in a leased house at the UW Center for Sustainable Forestry at Pack Forest until housing is developed within the park.



### ***Private Landowners near Mashel Prairie***

Coordination with property owners residing on and near the Mashel Prairie will be required to achieve the long-term goals of restoring and showcasing the Mashel Prairie. Approaches to the prairie area may involve property donations, voluntary sales (as property becomes available), and conservation easement donations or sales. Washington State Parks may seek private landowners to become stewardship partnerships.

### ***Town of Eatonville***

The Eatonville Chamber of Commerce and the Town of Eatonville have both been very involved in park planning, including serving on the exploratory committee and helping with public meetings. They are also interested in developing a trail between Eatonville and Nisqually-Mashel State Park Site. Coordination with Eatonville would help to establish an effective volunteer stewardship program, facilitating a strong sense of community involvement at Nisqually-Mashel State Park Site.

### ***Mount Rainier National Park***

The proximity of Mount Rainier National Park to Nisqually-Mashel State Park Site provides the opportunity for an ongoing collaborative effort to showcase the Nisqually watershed. A representative from Mount Rainier National Park who is on the exploratory committee for park development has invited Washington State Parks staff to participate in a feasibility study the national park is undertaking to create a Nisqually rural transportation system. This system would provide transportation between Tacoma and the two parks, including stops at local attractions and facilities located near the Nisqually entrance to Mount Rainier National Park.

### ***Others***

Other partners and collaborators may include the Pioneer Farm and Ohop Indian Village, Pierce and Thurston county parks and recreation departments, Tacoma Power, Ohop Power, the Backcountry Horsemen of Washington, the Evergreen Mountain Bike Alliance, and local river rafting companies or other recreational businesses.

### **Opportunities for Volunteer Involvement**

Development of the Nisqually-Mashel State Park Site represents an opportunity to establish a volunteer coordination program that will engage the community while building awareness and stewardship of local natural and cultural resources. A volunteer coordination program will provide essential support to park staff for resource stewardship activities.

In terms of park land management, using volunteers can extend stewardship capacity while contributing significantly to the development of local community connections with the Nisqually-Mashel State Park Site. The activities in which volunteers will likely provide and receive the greatest benefit include the following:

- Invasive plant species control and monitoring assistance.



- Critical species and critical habitat monitoring assistance.
- Trail construction, maintenance, and repair.
- Park operations assistance (e.g., campground hosts).

As mentioned, the park site contains significant invasive species populations. While observations by park staff and the use of IPM techniques will identify and prioritize sites and species for treatment, it may be suitable in many cases to use volunteers for weed removal, control, and monitoring activities. For example, treatment of invasive species populations that require hand removal techniques (such as Scotch broom near the confluence of the Nisqually River and the Mashel River, or Himalayan blackberry at the site of the restoration project near the mouth of Mashel River) may most effectively be accomplished by volunteers. Although a formal inventory and monitoring program following IPM principles will be adopted for the park site, it may also be beneficial to establish a Weed Watchers program. In such a program, volunteers can be trained to identify the park site's most problematic weeds. Participants can informally or formally monitor the status of existing weed populations and help to identify new infestations, providing assistance to park staff tasked with managing invasive species over such a large area.

A similar approach may be applied for monitoring critical species and critical habitat. Volunteers may be trained to identify critical wildlife species, and their assistance can be used during monitoring efforts. It may be beneficial to tie into the UW's NatureMapping Program, which conducted a focused, "bioblitz" effort at Ohop Creek in 2008.<sup>8</sup> That program has developed effective protocols for training volunteers in data collection and data reporting (<http://depts.washington.edu/natmap/>). Although not a replacement for formal monitoring efforts, volunteers can notify park staff of important events discoveries, such as migratory wildlife passing through the park site or the locations of newly established nesting sites.

During trail establishment and maintenance within the park site, volunteers can assist in construction (e.g., performing light vegetation clearing or assisting in rolling dip construction), placement of interpretive signs, and provision of guidance to visitors during trail closures.

Volunteers can also assist with many elements of park operations. For example, volunteers may be selected to serve as "campground hosts," whereby they receive free camping for a given period of time in exchange for overseeing campground activities (e.g., reserving campsites, selling firewood, addressing camper concerns, and assisting with fireside programs). They may also staff information kiosks or fill certain roles at the Welcome Center. Volunteers may also serve as mobile information and safety units,

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<sup>8</sup> A bioblitz is a 24-hour inventory of all living organisms in a given area. A full bioblitz must take place over a 24-hour period because different organisms are likely to be found at different times of day.

hiking throughout the park equipped with radios, first aid supplies, and maps and providing assistance to visitors in need.



