

Mount Si NRCA Management Plan

June 1997



WASHINGTON STATE DEPARTMENT OF
Natural Resources
Jennifer M. Belcher - Commissioner of Public Lands

Acknowledgments

Mount Si NRCA Advisory Committee

Barry Hankins, *Local Resident*
Ruth Ittner, *The Mountaineers*
Gordon Lowe, *Local Resident*
Frances North, *Local Resident*
Joan Simpson, *City of North Bend*
Mark Sollitto, *King County Parks Division*
Rocky Spencer, *Department of Wildlife*
C.J. Sturtevant, *Local Resident, Hang glider pilot*

Washington State Department of Natural Resources

Jennifer Belcher, *Commissioner of Public Lands*
Kaleen Cottingham, *Supervisor*
Stan Biles, *Deputy Supervisor*
Art Stearns, *Deputy Supervisor (retired)*

Forest Resources Division

Michael Perez-Gibson, *Division Manager*
Janice Friebaum, *Assistant Manager*
Mark Sheehan, *Natural Heritage Manager*
Pene Speaks, *Natural Areas Program Manager*
Marsha Hixson, *Environmentalist*
Gina Wendler, *Publication Support*

Media Productions

Blanche Sobottke, *Editor*

South Puget Sound Region

Bonnie Bunning, *Region Manager*
Clay Sprague, *Assistant Region Manager*
Robert Larson, *Assistant Region Manager (retired)*
Dave Kiehle, *Public Use Coordinator*
Doug McClelland, *King District Manager*
Darcy McNamara, *NRCA Conservation Planner*
Margaret Macleod, *Interagency Coordinator*
Rex Thompson, *Duvall Unit Forester*
Susan Combs-Bauer, *Recreation Planner*
Carol Thayer, *Geographic Information Specialist*

University of Washington

Gordon Bradley, *Professor, College of Forestry*
Jennifer Powers, *Research Assistant*
David Wortman, *Research Assistant*
Frank Westerlund, *Assoc. Professor, Urban Design & Planning*



Jennifer M. Belcher
COMMISSIONER OF PUBLIC LANDS

June 1997

Dear Friend:

The Mount Si Natural Resources Conservation Area (NRCA) Management Plan and Public Use Plan were prepared to provide direction for the protection and management of the natural ecological systems of Mount Si. Completion and approval of these plans is the culmination of many years of work by the Citizens Advisory Committee, the public, the University of Washington, and the Department of Natural Resources.

Future generations will benefit greatly from protection of the special resources at Mount Si NRCA. The significant features to be found on Mount Si make this NRCA an excellent example of Washington's natural heritage, especially since it's so close to the state's largest urban center. The NRCA supports unique geologic features, unusual plant communities and sensitive plant species, rare wildlife habitat, and incomparable low-impact public use opportunities.

I encourage you to stay involved as the Mount Si management plan is implemented. Join us in creating a legacy of wise management and stewardship at this extraordinary place.

Sincerely,



JENNIFER M. BELCHER
Commissioner of Public Lands

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Executive Summary

Mount Si NRCA Management Plan

The Mount Si Natural Resources Conservation Area, located approximately thirty miles east of Seattle, was established as a Natural Resources Conservation Area (NRCA) in 1987. Through land exchanges and acquisitions this area of state managed land currently includes 8,041 acres. Mount Si NRCA was designated to protect numerous resources, including outstanding geologic features, examples of old-growth forest, wildflower communities, and habitat for mountain goat and various other species. The area is steep and rugged and contains four mountain peaks; Mount Si, Mount Teneriffe, Green Mountain, and Little Si which range in elevation from approximately 1,600 feet to 4,800 feet.

Management guidelines for the Mount Si NRCA are provided by the NRCA Statewide Management Plan which requires the development of a site specific management plan.

The Mount Si Natural Resources Conservation Area (NRCA) will be managed to protect ecological systems and encourage natural successional processes while providing controlled opportunities for low-impact public use emphasizing environmental education.

The Planning Process

The Commissioner of Public Lands, with assistance from local DNR staff, appointed the eight-member Mount Si NRCA Advisory Committee, some of whom have been involved in issues concerning the management of Mount Si for many years. The Committee worked with DNR staff for 12 months to assist the DNR in identifying key issues, collecting information, and determining appropriate management prescriptions for the Mount Si NRCA. DNR staff and committee members evaluated issues raised by the public; completed ecological, cultural, and other field reconnaissance studies; and learned about the NRCA Act and the DNR's NRCA Statewide Management Plan (1992) to produce the recommendations in the plan.

Protected Resources

In accordance with the Statewide Management Plan, the Mount Si NRCA will be managed to protect outstanding examples of native ecosystems, habitat for threatened, endangered, and sensitive (TES) species, and scenic landscapes. Sensitive areas identified during the planning process include highly erodible soils, stands of old-growth forest, a high elevation Sitka spruce stand, wetlands and lakes, rock outcrops and grasslands, and riparian areas. All public uses and

management activities will be evaluated to determine potential impact on these resources as well as on scenic landscapes and any TES species identified in future site reconnaissance studies.

Ecosystem Maintenance, Enhancement, and Restoration

Several strategies and management prescriptions were developed to help maintain, enhance, and restore the ecological systems of the Mount Si NRCA. The Department will pursue establishing connections between the NRCA and other natural areas in the Cascade range to enhance the NRCA's role as a connecting corridor in a regional system of natural areas. Essential wildlife habitat will be identified and protected. Natural successional processes will be allowed to reestablish the natural character of the NRCA. Where necessary, disturbed ecosystems that are not recuperating through natural successional processes will be managed in a way that will assist their recovery. Habitat specifically required by TES species will be maintained, enhanced, and restored.

Public Use

Opportunities for low-impact public educational and recreational activities will be provided where such activities do not conflict with NRCA goals and do not diminish ecosystem quality and natural site characteristics. Activities generally not consistent with NRCA goals include camping/overnight use, hiking off-trail, mountain biking or horseback riding off-road or on non-designated trails, use of motor vehicles, snow mobiling, target shooting/archery, bear-baiting, and collection of plants, mushrooms, or firewood for non-tribal purposes. Information will be provided at or near NRCA entry points and near areas of interest explaining NRCA purposes and defining allowable uses. Public use will be monitored and additional restrictions imposed if necessary to meet NRCA goals.

Boundary Recommendations

The boundary of the NRCA encompasses 11,363 acres of which 8,041 are currently managed by the state. The area is surrounded by land uses such as forestry, agriculture, and residential uses. Ecologically based priorities recommended for acquisition include areas to the east of the NRCA; SMC Lake, Lake Nadeau, and Lake Moolock. Further connections between the NRCA and King County's Three Forks Park to the west should also be secured to provide lowland wildlife habitat for winter wildlife use. The most important public use priority is to acquire an alternate trailhead site and parking for access to Little Si.

Monitoring and Evaluation Program

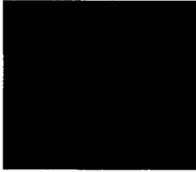
The success of the recommendations made in this document depends upon effective monitoring and evaluation. A detailed monitoring plan will be developed to provide further guidance in ensuring that management recommendations are being carried out and NRCA goals met. Monitoring should be done on an annual basis to provide valuable input for future revisions to this management plan. The document as a whole will be reviewed on a five-year cycle.



Preface

In 1987 the Natural Resources Conservation Area Act was passed by the Washington State Legislature. Mount Si was the first designated NRCA and is currently one of 22 NRCAs in the state. The NRCA program is a product of the work of many individuals, including the Commissioner of Public Lands, state legislators, residents, conservationists and recreationalists. The Department of Natural Resources (DNR) was selected as the agency to manage these lands for the multiple conservation purposes of protecting ecological systems and providing low-impact public use opportunities. The Mount Si NRCA Management Plan meets the requirements set forth in the Natural Resources Conservation Area Act (RCW 79.71) and adheres to the guidelines stipulated in the Natural Resources Conservation Area Statewide Management Plan (1992).

This document was developed with the assistance of the Mount Si Citizen's Advisory Committee, which identified key planning issues, provided valuable information, and provided comment on stewardship recommendations. Additional assistance came from various federal, state, local, and tribal agencies, organizations, citizens, recreational users, and faculty, research assistants, and students from the University of Washington.



Introduction

The Department of Natural Resources

The Department of Natural Resources (DNR) manages approximately five million acres of state-owned forest, aquatic, agricultural, range and urban lands. These lands are managed for long term benefits to designated public beneficiaries and the general public. Approximately 75,000 acres are managed for resource protection on Natural Resources Conservation Areas and Natural Area Preserves. DNR's Forest Resources Division is responsible for management of NRCAs.

Trust Lands were established when Washington became a state in 1889. The Congressional Enabling Act designated over 3 million acres to be managed for the benefit of schools, universities and other state institutions.

Forest Board Lands were acquired by purchase or transfer from the counties beginning in the 1930's. Revenue from these lands accrues to the county containing the Forest Board Lands.

Aquatic Resource Lands, 2.1 million acres of state-owned tidelands, shorelands, and beds of navigable lakes, rivers and marine waters, are managed by the Department to provide a balance of public benefits for all the citizens of the state.

Natural Area Preserves (NAPs), established by an act of the Washington State Legislature in 1972, contain high-quality natural habitat acquired by gift or purchase by the Department. NAPs are managed for the perpetual protection of rare species and outstanding ecosystems native to Washington State.

Natural Resources Conservation Areas (NRCAs) are the newest land designation to the Department. Created by an act of the Washington State Legislature in 1987, the NRCA program's multiple purposes include protecting outstanding ecological, geologic, and cultural resources while providing opportunities for low-impact public use.

The Mount Si NRCA Description and Location

The Mount Si NRCA, located approximately thirty miles east of Seattle, was established as a NRCA in 1987 (Figure 1). At that time approximately 4,670 acres were acquired through the funding and transfer of these lands from school trust land status to NRCA status. These lands incorporated the lands that had originally been set aside as a conservation area in 1977. Through land exchanges the state owned and managed area currently includes 8,041 acres while the boundary encompasses 11,363 acres (Figure 2). NRCAs statewide are managed under the guidelines developed in 1992 by the Statewide Advisory Committee in accordance with RCW 79.71. Mount Si was designated to protect numerous resources, including outstanding geologic features, examples of old growth forest, wildflower communities, and habitat for mountain goat and various other species.

The area is steep and rugged and contains four mountain peaks; Mount Si, Mount Teneriffe, Green Mountain, and Little Si which range in elevation from approximately 1,600 feet to 4,800 feet. The area is heavily forested with a variety of plant species of differing ages. Stands of old-growth (over 200 years old) mountain hemlock, western hemlock, and Douglas-fir are located at higher elevations, with second-growth stands being prominent in the lower elevations. The area also supports a variety of wildlife, including native mountain goat that use the steep cliffs, black bear, elk, deer, cougar, and coyote. There are also two small lakes in the higher elevations with associated wetlands. Numerous streams traverse the area and provide important riparian habitat for plants and wildlife.

The Mount Si NRCA has high levels of public recreational uses, primarily on the Mount Si Trail and the Little Si Trail and rock climbing areas. There are some areas of resource degradation, instances of trespass as reported by adjacent landowners, and minor conflict among various user groups. Use levels are expected to continue to rise. For these reasons, management of recreation is a high priority in the management of the Mount Si NRCA. Public use will be closely monitored and a Public Use Plan has been developed to determine site specific solutions to public use issues consistent with the goals and guidelines in the Management Plan.

Site Planning Process

The Mount Si NRCA Management Plan, developed by DNR's South Puget Sound Region, consists of an inventory of existing uses and natural features and analysis of these conditions. Management recommendations were developed based on existing conditions, NRCA guiding program policy, and public comment. The NRCA was divided into seven land units based on ecological sensitivity. Management strategies were developed for each area.

Figure 1: Vicinity Map

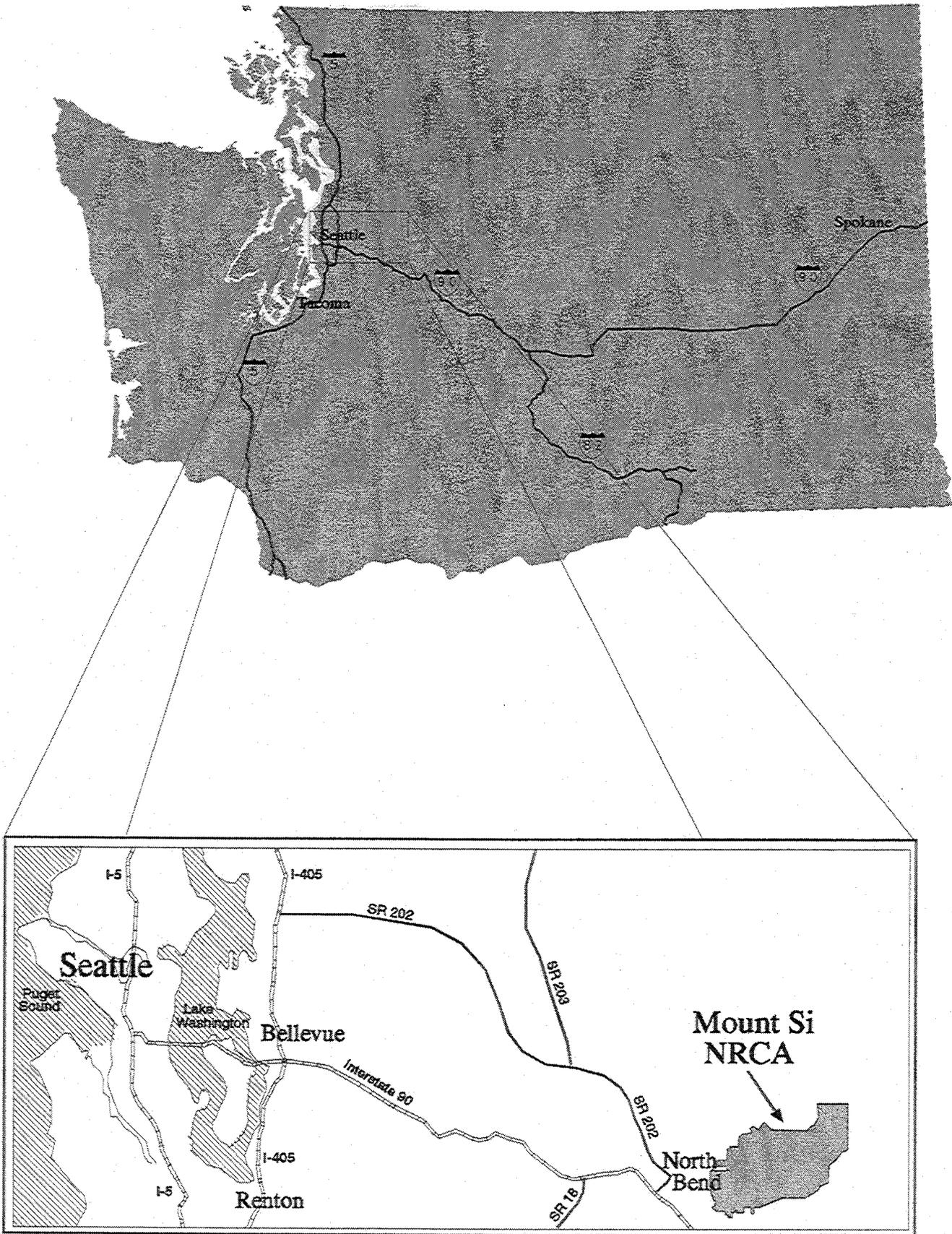
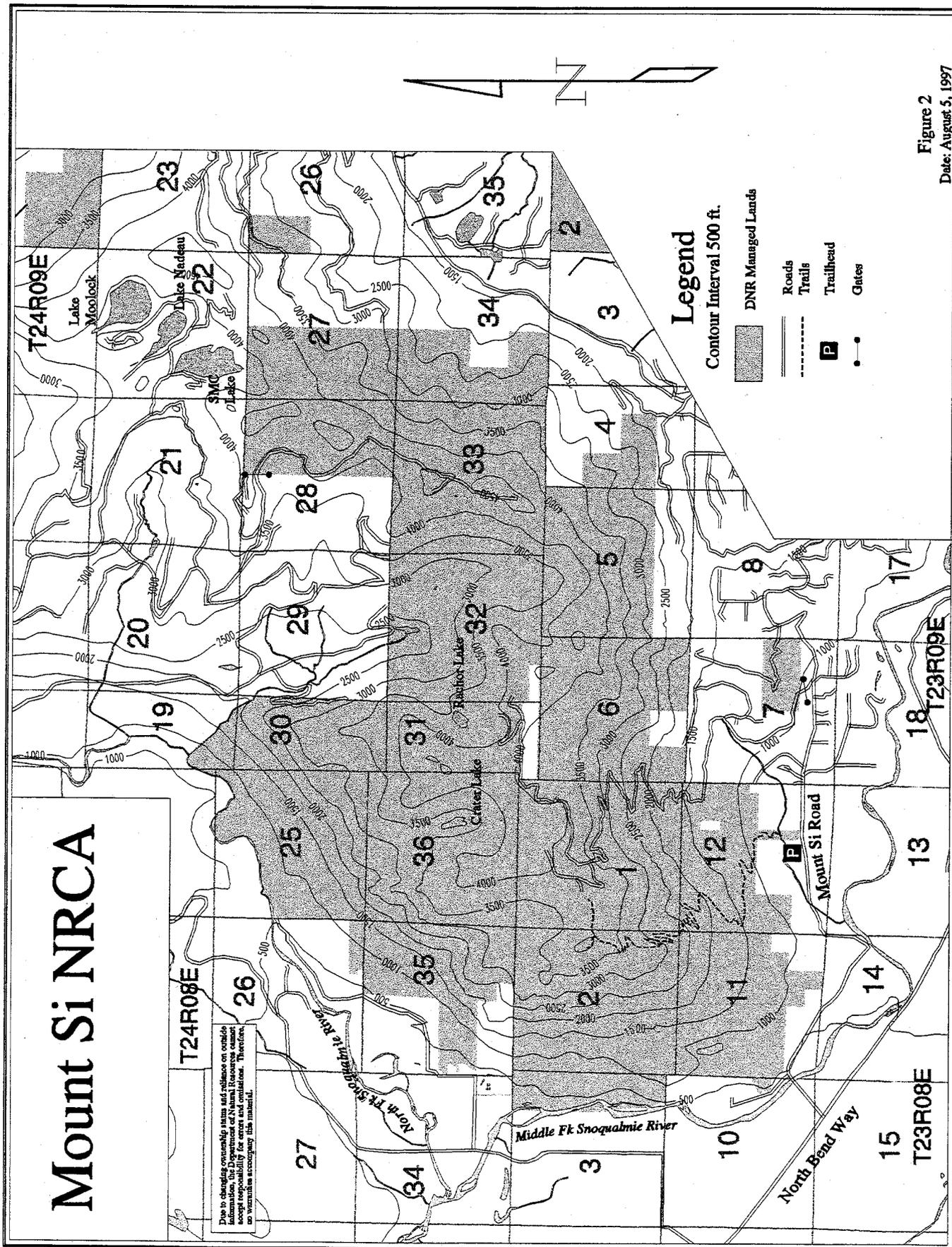


Figure 1

Figure 2: Mount Si NRCA



An ecological site inventory was conducted by the DNR's Natural Heritage Program. A cultural resource survey was conducted by a private consulting firm. Research assistants from the University of Washington also gathered information pertinent to the development of this document. This information included relevant state and local policies, previous studies completed for the site, discussions with local citizens, interest groups, government agencies, and a survey of visitors.

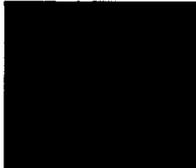
The analysis phase was conducted with the assistance of a class from the University of Washington, College of Forest Resources. The class evaluated current resource and public use conditions in light of NRCA program goals and recommended management strategies. Final goals, strategies, and management prescriptions were developed based on these recommendations, along with extensive input from the Mount Si NRCA Citizen's Advisory Committee.

Public Review

In compliance with the State Environmental Policy Act (SEPA; RCW 43.21) and the NRCA Statewide Management Plan, the draft management plan was available for review and comment by the Statewide NRCA Committee, the public and tribal, federal, state, and local agencies prior to final approval by the Commissioner of Public Lands. Two public meetings on the plan and a public hearing on the recommended site boundaries were held during the public review period.

Plan Review Process

Following adoption, this document will be reviewed by the Department of Natural Resources, the Statewide NRCA Advisory Committee, and the public on a five-year cycle. The NRCA will be closely monitored, and interim management strategies will be developed if resource conditions warrant. These reviews will enable the document to be revised to address current management issues.



Program Purpose

The Mount Si Natural Resources Conservation Area (NRCA) Plan was prepared in conformance with the Natural Resources Conservation Area Act (RCW 79.71) and Department of Natural Resources Statewide Management Plan guidelines. The purpose of this plan is to provide site guidelines for the management of the Mount Si NRCA.

Natural Resources Conservation Area Act

The Washington Natural Resources Conservation Areas (NRCA) Act was created by the legislature and approved by the Governor on May 18, 1987 as RCW 79.71. The Act defines the characteristics of an NRCA as:

- Lands with a high priority for conservation, natural systems, wildlife and low-impact public use;
- An area of land and/or water with flora, fauna, geological, archaeological, scenic or similar critically important features that retains to some degree or has reestablished its natural character;
- Examples of native ecological communities; and
- Environmentally significant sites threatened by incompatible or ecologically irreversible developments.

The act further defines the purposes of a conservation area as:

- Maintaining, enhancing or restoring ecological systems, including but not limited to aquatic, coastal, riparian, montane, and geological systems, whether such systems be unique or typical to the state of Washington;
- Maintaining exceptional scenic landscapes;
- Maintaining habitat for threatened, endangered, and sensitive species;
- Enhancing sites for primitive recreational purposes; and
- Providing opportunities for outdoor environmental education.

Natural Resources Conservation Area Statewide Management Plan

In 1992 the NRCA Statewide Management Plan was developed with the assistance of a nine member citizen's advisory committee. The plan prioritizes the purposes and permitted uses of the NRCA as follows:

The primary purpose of the NRCA program is to protect outstanding examples of native ecosystems, habitat for threatened, endangered, and sensitive (TES) plants and animals and scenic landscapes.

Opportunities for environmental education and low-impact public uses will be provided where such uses do not adversely affect the resource values the area is intended to protect.



Resource Inventory

Physical attributes described in this section include: soils, wetlands and aquatic resources, vegetation, wildlife, scenic landscapes and cultural resources. Sensitive and disturbed areas are also discussed.

Soils

Mount Si NRCA contains fourteen different major soil unit types. Different parent materials have interacted with climate, topography, living organisms, and time to form the various soils on the site. Major soil types were defined as covering an area of 200 acres or greater. Soils were evaluated for runoff, compaction, and erosion potential and slope and soil stability. Soil capability (listed below) refers to the soil's tolerance to modification from public uses. The capability of the soil to withstand public use and other impacts was evaluated. The soils were ranked low, moderate, and high indicating that a low capability soil would be less tolerant to disturbance than a high capability soil. This information was used to determine appropriate public uses and management activities in different areas of the NRCA. Soil capability ratings are:

High Capability: These soils can support most uses and have a low erosion potential, low to moderate runoff and compaction potential. Slopes are generally stable.

Moderate Capability: These soils can support limited uses as long as precautions are taken. Erosion potential, runoff and compaction potential are low to moderate, and slopes may be somewhat unstable.

Low Capability: These soils should be avoided for most uses. They are highly erodible, may have high runoff or compaction potential, and may be found on steep or unstable slopes.

Wetlands and Aquatic Resources

Mount Si NRCA contains six major drainage basins, as identified from topographic information. There are a number of stream systems, all of which drain either to the Middle Fork or North Fork of the Snoqualmie River. Due to the steep nature of the area, the streams have rocky beds with narrow, constrained channels. Most of the streams within the NRCA are small and

many are seasonal in nature. Major perennial streams include the outflows from Rachor and Crater lakes and a stream flowing off the south slopes of Mt. Teneriffe. Many of these streams have been subject to erosion and siltation from the existing road network and previous forest management.

The NRCA contains two small lakes, Rachor Lake and Crater Lake. Both of these lakes are approximately five acres in size and are located at approximately 3,500 feet in elevation. Crater Lake, with a relatively uniform depth of four feet, contains the largest undisturbed wetland in the NRCA at its south end. Bladder sedge is the dominant emergent plant species. Pacific willow, huckleberry, salmon berry, and devil's club are found upland from the lake. The area is sensitive to trampling, and would recover slowly following a disturbance. Due to the extremely steep topography surrounding the basin, the lake has not been substantially disturbed by human activity.

Rachor Lake, approximately 15 feet deep, consists of more open water and sustains little wetland vegetation. Past forest management activities resulted in greater disturbance to this lake. Douglas' spirea, skunk cabbage, bluejoint reedgrass, lenticular sedge and an unidentified fresh water sponge are all present. Both Rachor and Crater lakes have been stocked with rainbow trout in the past. Crater Lake was last stocked in 1990, while Rachor Lake was last stocked in 1988 (Crawford, et. al., 1992).

Two other wetland areas are located in the NRCA. A 7.5-acre young forest-type wetland is located northwest of Green Mountain. It is dominated by red alder, Sitka willow, salmon berry, and skunk cabbage. Due to past forest management activities, common rush has established itself in the area; however, native plant species dominate the recovering vegetation. This wetland is located adjacent to a stream and appears to be fed by seasonal flooding of the stream. The 2.7-acre shrub-type wetland located southeast of Little Si is a fairly uniform shrub wetland dominated by red alder, Sitka willow, salmon berry, lady-fern and slough sedge. There is little evidence of human disturbance. It appears to be in good condition (Crawford, et. al., 1992). Two non-native species are present, Himalayan blackberry and deadly nightshade.

Another significant hydrologic feature of the NRCA is the City of North Bend watershed, located on the steep, rocky western slopes of the area. This watershed area is the source of a spring that is a primary water supply for the city of North Bend. Although the City of North Bend owns an 82-acre area for the purposes of maintaining the quality of this spring, it is likely that this spring is recharged by a significantly larger area in the NRCA (City of North Bend Water and Sewage Comprehensive Plan, 1991).

Vegetation

The Mount Si NRCA contains some unusual assemblages of plant species as well as typical vegetation patterns of three forest zones. The western hemlock zone is found along lower slopes and lowlands. The Pacific silver fir zone occurs on upper and north-facing slopes. The mountain hemlock zone occurs on the highest ridges and north slopes. One unusual plant community is defined by the presence of high elevation Sitka spruce in a small area in the north central portion of the NRCA, as well as on the south side of the Mount Si summit meadow area. There are only small remnants of old-growth forests remaining within the western hemlock zone on the NRCA. Natural forests in this zone are fragmented and generally found only at higher elevations. The current composition of species, stand age, and stand structure reflects soil and microclimate characteristics, as well as forest management and fire history.

There are over 300 plant species within the NRCA. There are two known listed sensitive species, clubmoss cassiope (*Cassiope lycopodiodes*) and boreal bedstraw (*Galium kamtschaticum*); and one proposed threatened species (*Tetraplodon mnoides*), dung moss, English holly, a shade-tolerant exotic plant, occurs sporadically throughout the area. The western hemlock zone on the NRCA is fairly healthy. Tree regeneration is very good in most sites, and the area will support a variety of species. This zone will recover well from large disturbances but is sensitive to exotic species invasion. Much of the Pacific silver fir zone has been disturbed through forest management activities, particularly in the north parts and in the Green Mountain vicinity. The largest undisturbed areas in the zone occur around the Crater Lake basin which is in excellent condition.

Within the mountain hemlock zone, harvesting has fragmented the original ridge line forests into three areas. The largest concentration of mountain hemlock occurs around Green Mountain. The next largest concentration is found near Crater and Racher Lakes. A few stands are also found in the northeast corner of the NRCA. Overall, this zone is in good condition, but because it is slow-growing, it is least resilient to human impacts.

Grass and shrub-dominated communities occur on broad open ridges and slopes south of Mt. Teneriffe, and on east to south aspects on the ridges around Crater Lake. Areas are covered by a mix of grasses, sedges, and forbs, intermixed with huckleberry species and beargrass shrubfields. Trees are slowly invading these sites.

Wildlife

The NRCA contains a variety of distinctive wildlife habitats, including cliffs, rock outcrops, streams, lakes, and old-growth forests. Habitats within the NRCA are often determined by geomorphology rather than by plant

communities. These habitats, including cliffs, talus slopes and caves, contribute to species diversity within a particular plant community. These areas can rarely be created artificially. Other distinct areas include the old-growth forests in the vicinity of Crater Lake and around Green Mountain.

There has been little systematic zoological inventory work within the NRCA to date. Habitat/species associations have been reviewed in order to determine which species are likely to occur within the present habitats. Mammals which are present or expected include elk, deer, black bear, coyote, red fox, raccoon, cougar, bobcat, mountain beaver, pikas, snowshoe hares, weasels, skunks, bats, rodents, shrews, moles, and mountain goats. Mountain goat habitat has been mapped. Mountain goats prefer steep, rocky south, southwestern, and/or eastern slopes.

The NRCA may provide suitable habitat for at least four threatened, endangered, or sensitive (TES) mammals: the gray wolf, the grizzly bear, the fisher, and the marten (the fisher and marten are state-listed). The area also provides suitable habitat for a variety of bird species. The patches of old-growth within the area potentially provide habitat for federal threatened and state endangered spotted owl and for other sensitive or candidate birds, including marbled murrelets, Vaux's swift, band-tailed pigeons, and pileated woodpeckers. The prior three species are known to inhabit the area. A pair of peregrine falcons successfully fledged three chicks in 1997.

Scenic Landscapes

The Mount Si NRCA is an outstanding scenic resource as viewed from points within and outside of the NRCA. Viewed while driving by on Interstate 90, from the surrounding communities, or from more distant urban areas to the west, Mount Si is a well known landmark for many residents of Washington State and is an important visual link in the Mountains to Sound Greenway.

The unique accessibility of Mount Si to major population centers of the Puget Sound basin offers visitors a quality visual experience. The nearby towns of North Bend and Snoqualmie, set in a rural area, add to the uniqueness of the conservation area as a finger of wilderness jutting into a tide of development moving east from Seattle and the suburbs.

The NRCA also contains significant interior visual features including the four mountain peaks, Rachelor and Crater Lakes, and significant stands of old-growth forest. Views from the four summits and other viewpoints provide a panoramic view of Mt. Rainier, the Cascade Mountains, the Olympic Mountains, and the Snoqualmie Valley. Views of the valley and surrounding areas can also be seen from along roads and trails within the NRCA.

Cultural Resources

Lying between the North and Middle Forks of the Snoqualmie River, Mount Si and its neighboring peaks have long been an important landmark in the lives of the different peoples who have lived in and traveled through this region. The stark rise of these peaks from base to summits of over 4,000 feet have long inspired settlers and Native Americans with awe and respect. Native Americans who lived for centuries within sight of the peaks have utilized the area for its resources, and as a spiritual place in which they attain their identity and importance within their tribes. The area, as a whole, in addition to specific sites within it, is of great spiritual significance to native people, settlers, and others.

Because the Snoqualmie Valley served as a major crossroads for Native American trade, it was heavily used by the indigenous people of the region. Though an archaeological survey did not locate any specific cultural or historical sites in the NRCA, it did conclude that the area has spiritual importance to the Snoqualmie Tribe who has used and continues to use the area for cultural purposes (Rice and Robinson, 1992).

Sensitive Areas

Six types of sensitive areas are found on Mount Si (Figure 3). Each of these areas is important to protect because each is unique or represents a sensitive physical or biological structure, and/or provide special wildlife habitat value. The following sensitive areas were identified and mapped:

Erodible soils: These areas are sensitive due to a low tolerance for disturbance. Erosion of these soils can cause loss of vegetation, sedimentation of streams and lakes, and deterioration of visual quality.

Old-growth forests (200+ years old): Patches of forest exhibiting old-growth characteristics provide unique habitat for a variety of species such as northern spotted owl, marbled murrelets, Vaux's Swift, band-tailed pigeons and pileated woodpeckers. Such areas may also contain high numbers of invertebrates. In addition to its ecological value, the old-growth forests with their exceptionally larger trees are also valuable as a visual amenity. Much of the old-growth forest on Mount Si consists of mountain hemlock and Pacific silver fir.

Sitka spruce range: The NRCA contains an unusual high-elevation stand of Sitka spruce.

Wetlands and lakes: The wetlands and lakes of the NRCA provide diverse habitats for aquatic plants and wildlife communities and also add to the visual diversity of the area.

Rock outcrops and grasslands: Ridges in the higher elevations of the NRCA contain several areas of subalpine meadows, grasslands and rock outcrops. These areas have thin, easily erodible soils. They provide unique, irreplaceable habitat for sensitive plant species, native mountain goats, and cliff dwelling raptors such as the peregrine falcon.

Riparian areas: Areas adjacent to streams are capable of supporting unique and sensitive vegetation. Vegetation in riparian areas helps to prevent erosion and runoff into the streams. These areas also provide food, water, and cover for a number of species.

Disturbed Areas

There are significant areas of disturbed landscape within and around the NRCA, stemming from past forest and mining activities, and continuing recreational use. These areas were identified so that appropriate restoration and/or enhancement measures may be taken. Areas and corridors in the NRCA have been disturbed or modified to differing extents by several types of activities within the past 50 years (Figure 4). Different activities that occurred at different times are grouped into four levels of modification.

- Unmodified Areas are those areas that are essentially unchanged and include areas with no roads or trails, no mining activity, and no forest management activities within the last 40 years.
- Subtly modified areas include those places where current recreational use exists, such as along designated trails. Slight or low modification has also occurred where forest management activities took place 16 to 40 years ago.
- Substantially modified areas, are those areas where forest management activities have occurred within the last 15 years, where roads are currently open or abandoned but have not yet recovered to their predisturbed state, where mining activities have taken or are taking place, and where unofficial trails or roads are in use.
- Degraded landscape areas occur where any modifying activity has taken or is taking place within a sensitive area such as old-growth forest and wetlands, or on rock outcrops or highly erodible soils.

Figure 3: Sensitive Areas

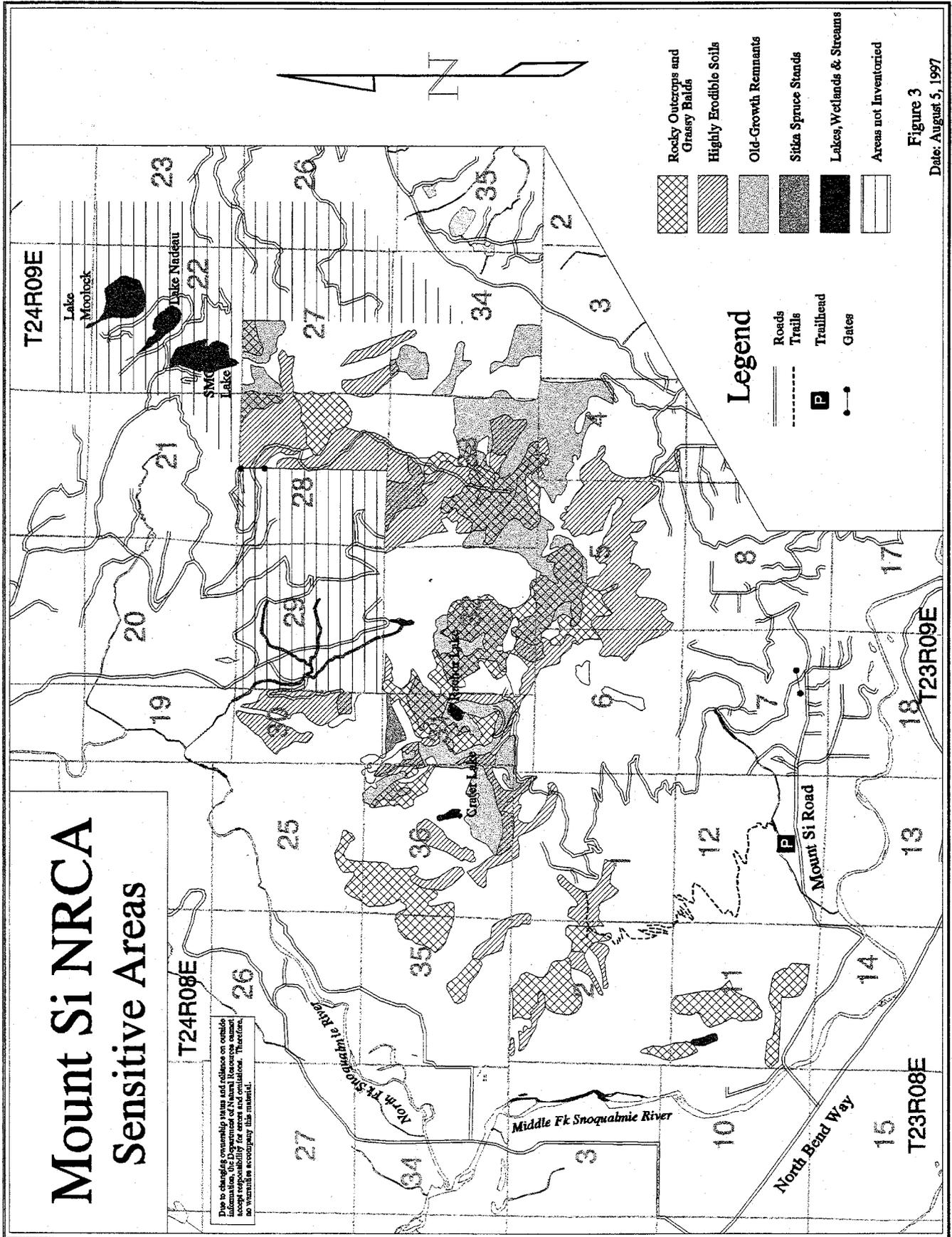
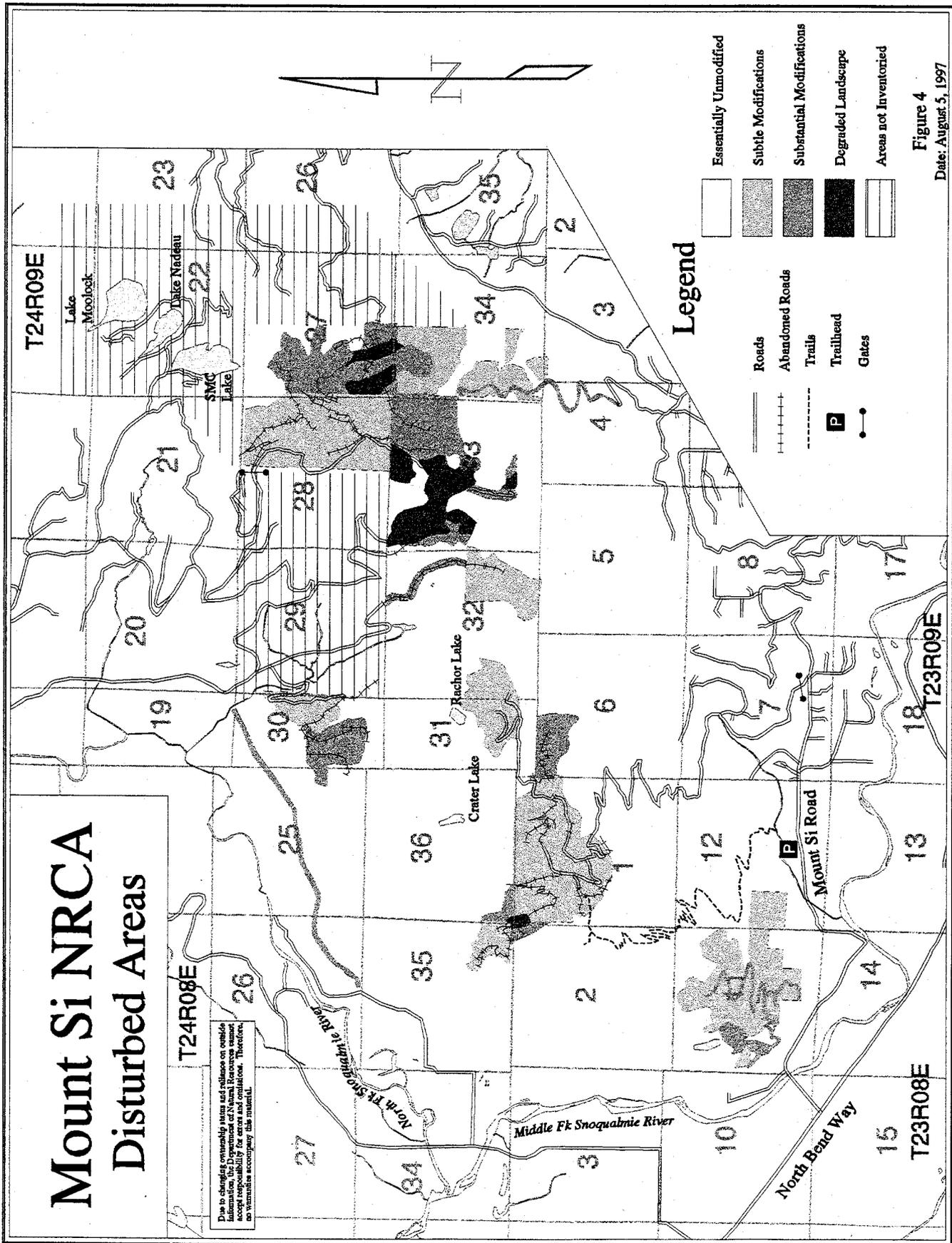
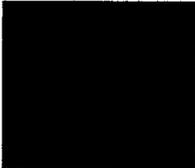


Figure 3
Date: August 5, 1997

Figure 4: Disturbed Areas





NRCA Boundary

The proposed boundary of the Mount Si NRCA encompasses 11,363 acres, of which 8,041 are currently managed by the state (Figure 5). Private property within the boundary is not affected by the management recommendations in this or any other plan developed by the DNR. Any and all acquisition is accomplished with a willing seller and is dependent upon available funding.

The NRCA is a relatively large area of diverse landscape that provides a wide range of natural resource management, recreation and education opportunities. Currently, the NRCA is somewhat isolated from other areas that provide similar opportunities, and is surrounded by land uses such as forestry and residential uses. Connections to other natural and recreational areas are possible in light of future land exchanges. The boundary of the NRCA has been reviewed, taking into account natural resource protection opportunities, wildlife connections, adjacent land uses, and property acquisitions planned by other jurisdictions.

Figure 5 shows part of the boundary as a “Study Area.” Much of the land along the study area NRCA boundary line is actively being considered for land transfer or acquisition from the current private owner to various public agencies. The goal, after these lands are acquired, is to determine the final boundary based on ecological considerations rather than on ownership lines. Specifically, further analysis is necessary to determine the boundary between the NRCA and adjacent future state forest land. An integrated forest management approach, similar to Tiger Mountain State Forest and West Tiger NRCA will be used to determine the final boundary. The study area boundary on the map indicates where the boundary is anticipated to be. After acquisition is complete, the line will be “ground truthed” and a public hearing will be held to confirm the boundary.

Future acquisitions have been prioritized according to the NRCA Statewide Management Plan.

Figure 5: NRCA Boundary & Proposed Acquisitions

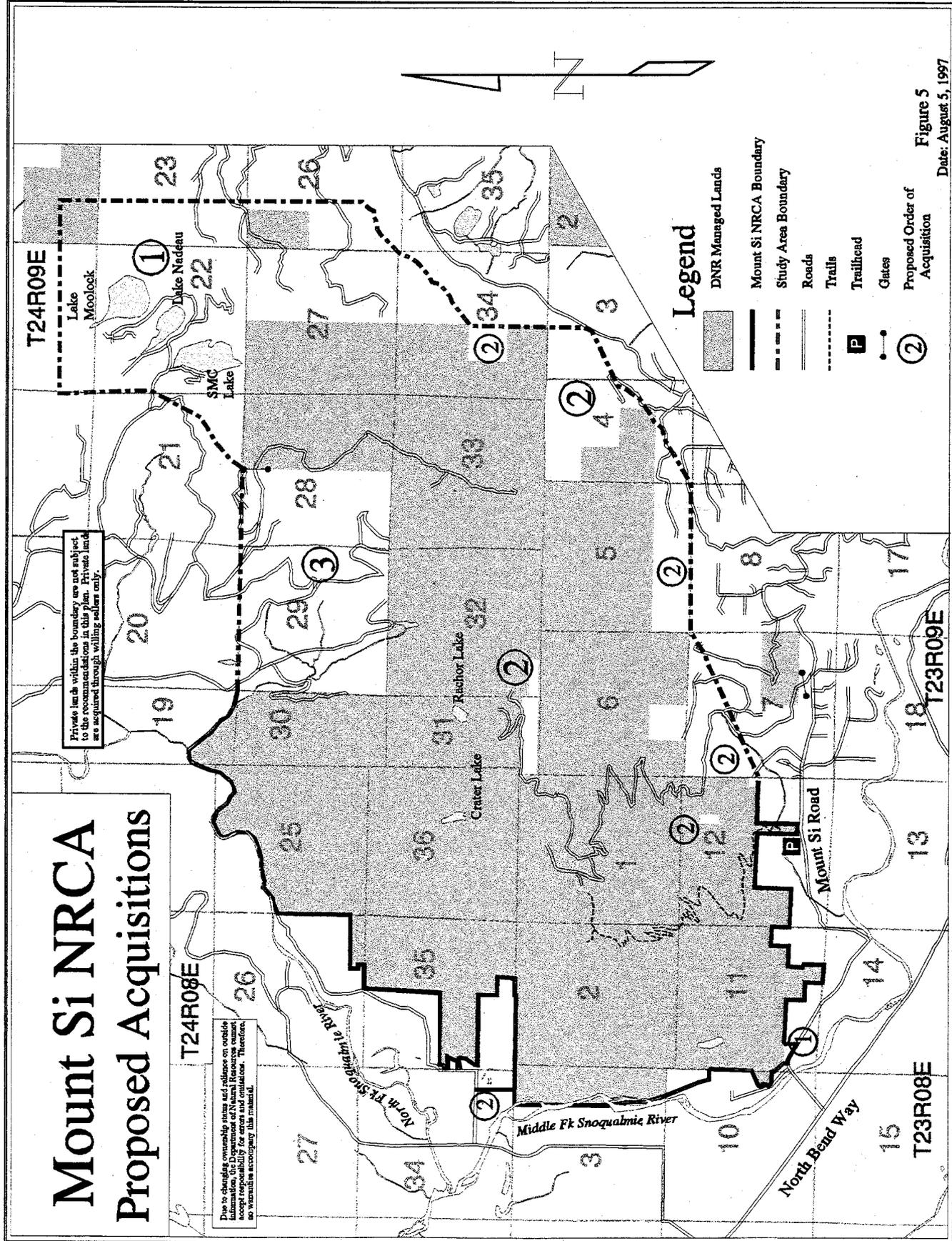


Figure 5
Date: August 5, 1997

Recommended Acquisition Priorities

Ecological Priorities

PRIORITY 1:

Efforts should be made to acquire lands to maintain a corridor for wildlife migration from US Forest Service-managed land to the east, especially the Alpine Lakes Wilderness area. The lands most suitable for this are along the ridge to the northeast. These include the areas around SMC Lake, Lake Nadeau, and Lake Moolock. If this land is pursued, careful consideration of the consequences of possible trail connections to Alpine Lake Wilderness Area should be undertaken. Acquisition should be coordinated with US Forest Service.

PRIORITY 2:

Connections to undeveloped lowland areas should be maintained for winter wildlife use. Acquisition of areas along the Middle Fork of the Snoqualmie River should be coordinated with King County to create a connection with King County's Three Forks Park.

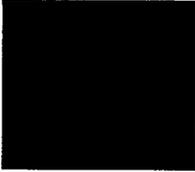
All private lands inside the NRCA boundary should be acquired to ensure the ecological integrity of the area. This would reduce habitat fragmentation and disturbance. Activities on these lands could include timber harvest, residential development, and/or mining. These uses are inconsistent with conservation goals for the NRCA. Conservation easements are excellent tools to meet NRCA goals when a landowner wishes to retain fee simple ownership.

PRIORITY 3:

Acquisition of the large parcel on the northern boundary, which includes Racher Creek, should be pursued to facilitate wildlife movement by reducing fragmentation.

Public Use Priorities

The Little Si trail is experiencing increasing levels of use by hikers and climbers accessing the climbing areas on the east side of Little Si. Visitors often cross private property to access the trail, and must park roughly one quarter mile away at a parking area in a public right-of-way. Serious conflicts have arisen with area residents over the trespass and parking conditions. DNR must work toward acquiring land that will reduce disturbance to property owners and provide continued access to the area.



Stewardship Recommendations

The Statewide NRCA Management Plan provides policy guidance for the selection and evaluation of appropriate management priorities and strategies for individual NRCAs. The Statewide Plan also recognizes that the opportunities, constraints, and needs of each NRCA vary, and that management philosophy should reflect the uniqueness of each area.

The Mount Si NRCA provides a unique combination of natural resource, recreation and education opportunities. The management philosophy for the area encompasses these values and provides specific direction for their management in the Mount Si NRCA. The management philosophy is supported by general goals that apply (where appropriate) to the entire NRCA. Following them are recommendations specific to each land unit in the NRCA.

Management Philosophy

The Mount Si NRCA will be managed to protect ecological systems and encourage natural successional processes while providing controlled opportunities for low impact public use, emphasizing environmental education.

This overriding management philosophy is supported by several major NRCA policy goals, as defined below. Specific strategies for accomplishing these goals are also defined.

General Management Goals for the Mount Si NRCA

- Maintain, enhance and restore ecological systems
- Maintain or provide habitat for threatened, endangered, and sensitive species
- Maintain scenic landscapes
- Protect cultural resources
- Enhance opportunities for environmental education
- Provide opportunities for low-impact public use

Following are the management strategies and prescriptions for the General Management Goals.

General Management Goals, Strategies, and Prescriptions

Note: Please refer to Land Unit section for more specific management strategies on each Land Unit.

GOAL: Maintain, Enhance and Restore Ecological Systems

MANAGEMENT STRATEGIES:

- Connect Mount Si NRCA with other natural areas in the Cascade Range and enhance the role of the NRCA as a pivotal connecting corridor in the regional system of natural areas.
- Further identify and protect essential and valuable wildlife habitat to, facilitate natural biological diversity, reduce fragmentation of the areas genetic resources and reduce geographic isolation of ecosystems.
- Wherever possible, allow natural successional processes to proceed to reestablish the historical natural character of the area.
- Manage disturbed ecosystems that are not recuperating through natural successional processes in a way that will assist their recovery. Restore areas where ecosystem quality is degrading through erosion, non-native plant invasion, or other means.

MANAGEMENT PRESCRIPTIONS:

The Department should:

- Establish formal and informal management agreements with landowners and appropriate agencies to protect and enhance existing wildlife corridors between natural resource areas such as the Alpine Lakes Wilderness, Mount Baker-Snoqualmie National Forest, the North Bend Watershed, Three Forks Park, and Weyerhaeuser Company lands.
- Acquire, through willing sellers, properties identified under Boundary section of this plan.
- Develop an Integrated Forest Management approach with adjacent state forest lands.
- Allow natural processes (including natural disturbance, such as windstorms and floods, excluding fire) to reestablish the natural character of the land.
- Encourage establishment of desirable native species on the NRCA. In restoration, carefully evaluate appropriateness of native and non-native plant material. Use local stock whenever possible when restoring with native plants.
- Assess habitat value and perform population surveys for species including mountain goat, northern spotted owl, Vaux's swift, black swift, and fisher.

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- Define minimum habitat requirements and limits of acceptable change for indicator species populations.
 - Actively pursue baseline studies for those plant and/or animal species of significance which have not already been studied. Pursue ongoing monitoring of these species. Conduct further study of mountain goat migration routes in the non-winter months.
 - Remove exotic invasive plant and animal species when practical, if successional processes are not expected to reduce their populations and they threaten ecosystem integrity or habitat of flora or fauna. Monitor newly regenerating areas, recently closed roads, areas impacted by recreation and other disturbed areas for the invasion of exotic plant species as vegetation becomes reestablished.
 - Work with the City of North Bend to protect and maintain the city watershed adjacent to and within the western portion of the NRCA. Determine if a memorandum of agreement to manage the watershed area with compatible conservation goals should be developed.
 - Support the efforts of the Mountains to Sound Greenway Trust. Help designate a system of natural areas forming a connected corridor from Puget Sound to the eastern foothills of the Cascade Mountains in the Interstate 90 corridor.

GOAL: Maintain or Provide Habitat for Threatened, Endangered, and Sensitive Species

MANAGEMENT STRATEGY:

Maintain, enhance, or restore habitats specifically required by state and federal Threatened, Endangered, or Sensitive (TES) plant and animal species.

MANAGEMENT PRESCRIPTIONS:

The DNR should:

- Identify suitable habitat for TES species.
- Evaluate reintroduction of extirpated TES species in areas of suitable habitat.
- Give highest priority to the protection of designated TES species and their occupied and potential habitat in all management decisions.
- Work cooperatively with other agencies and organizations with expertise in species management in the evaluation of regional TES species.

GOAL: Maintain Scenic Landscapes

MANAGEMENT STRATEGY:

Preserve visual and aesthetic resources provided by Mount Si NRCA's unique location at the interface of urban development and rural areas in the Puget Sound metropolitan region.

MANAGEMENT PRESCRIPTIONS:

DNR should:

- Maintain existing scenic vistas in those areas that have been designated to receive the highest level of public use.

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- Protect on-site aesthetic qualities by using rustic materials in the design of public facilities, including interpretive signs or kiosks, public rest rooms, picnic tables, benches, viewing platforms, interpretive structures, or other facilities.
 - Where possible, encourage placement of management activities and site development in areas which are out of sight from major viewpoints. Appropriate natural screening may be used where activities or site development occur.
 - Work with King County, city of North Bend and city of Snoqualmie to minimize impacts of development to the views from the NRCA.
 - Manage public uses to maintain scenic landscapes and natural settings.

GOAL: Protect Cultural Resources

MANAGEMENT STRATEGY:

Protect existing cultural and historic resources in the NRCA, with specific emphasis on tribal heritage resources.

MANAGEMENT PRESCRIPTIONS:

DNR should:

- Continue to work with Tribes to identify and protect sites of tribal significance.
- Incorporate Native American, historic, and cultural values and resources into educational programs within the NRCA.

GOAL: Enhance Opportunities for Environmental Education

MANAGEMENT STRATEGIES:

- Create greater understanding and appreciation of the conservation aspects of Mount Si NRCA, and instill a sense of stewardship in the protection of its significant natural resources.
- Provide a living classroom as an educational resource for all citizens of Washington State, with special emphasis on the K-12 program.
- Establish or join a network of volunteer educators to teach others about the environment and their relationship to it.
- Integrate environmental education efforts on Mount Si with those on other state trust lands in the area in order to present an integrated program.

MANAGEMENT PRESCRIPTIONS:

The Department should:

- Provide informational signs, kiosks, maps, or brochures at or near the entry points to the NRCA which explain the purposes of NRCAs, acceptable uses of the site and rules of public use. Maps and brochures may be distributed at strategic sites.
- Where appropriate, provide interpretive signs at or near areas of biologic, geologic, historic, or prehistoric interest to educate and instill in the public a sense of stewardship. Avoid overuse of signs, and use appropriate materials to blend with surroundings.

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- Coordinate with programs, organizations and local educators and school districts to develop educational materials and programs.
 - Recruit volunteers and train new staff and educate users as to NRCA goals, sensitive areas, and use regulations while providing education on natural and cultural history, and recreational opportunities.
 - Incorporate restoration efforts into educational programs.
 - Actively pursue funding for a full-time education coordinator for the NRCA program in the King District.

GOAL: Provide Opportunities for Low-Impact Public Use

MANAGEMENT STRATEGY:

- Accommodate public recreational and educational activities where use levels and activities do not conflict with NRCA goals and do not diminish ecosystem quality and natural site characteristics.
- Develop a Public Use Plan for Mount Si as a supplement to this Management Plan that specifically addresses public use in the NRCA.

MANAGEMENT PRESCRIPTIONS:

The Department should:

- Allow low-impact public uses that are consistent with NRCA goals and policies in order to provide protection to natural ecosystems. Specific exceptions are noted for individual land units. Activities generally not consistent with the Mount Si NRCA goals are: camping/overnight use, hiking off-trail, mountain biking and horseback riding off-road or on non-designated trails, use of motor vehicles, snowmobiling, target shooting/archery, bear-baiting, and plant collections, mushrooms or firewood for non-tribal purposes. All commodity-based activities (i.e. mining, timber harvesting) should also be precluded, though selective forest management activities associated with adopted land restoration or rehabilitation plans could be permitted on a case-by-case basis.
- Work with user groups so they gain an understanding and appreciation of the conservation goals of the NRCA. The DNR will strive to enable user groups to become responsible stewards of the area. This includes providing training and volunteer opportunities, tools and other necessary equipment to help in maintaining, restoring, and enhancing public use areas.
- Closely monitor public use levels. Where ecological processes are being damaged, use will be controlled, and site enhancement or restoration will be employed.
- Close and gate all roads in the NRCA and restrict motorized vehicle access. Existing roads that are not needed for NRCA maintenance, fire management or rescue operations should be deactivated as soon as possible to prevent further erosion and degradation and decommission as soon as legally and financially feasible. Motorized access on remaining roads may be allowed on a restricted basis for management operations, private land owners or those with mining rights, or by special permit only.

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- Allow vehicular access on the Teneriffe Road for hang gliding on a season by season basis until the road is deactivated.
 - Evaluate trails and roads within NRCA. Develop criteria and determine which trails should be designated official, which should be relocated or closed (if any), and if any new trails should be built.
 - Rehabilitate and improve trails where necessary to encourage trail use and discourage off-trail activities. Maintain official trails and informational signs.
 - Keep pets leashed at all times within the NRCA to minimize conflicts with wildlife and other users. Monitor and assess impacts of pets. Consider restricting pets in the NRCA if necessary to accomplish conservation goals.
 - Use effective signage to educate users. Post the general rules and regulations of the NRCA and map of the area at trailheads.
 - Allow incidental mineral collection only where there is no noticeable disturbance to the landscape to prevent damage to natural resources. Areas where rocks are collected recover slowly, if at all, from such disturbance.
 - Work with user groups to reduce public use impacts. Limit, or possibly suspend activities if public use further degrades sites. Undertake mitigation and restoration measures where necessary.
 - Work with user groups to reduce impacts and conflicts arising from recreational trail use and to promote trail maintenance by users.
 - Limit public uses where such uses would impact sensitive seasonal wildlife activities such as nesting, roosting, or foraging.
 - Identify private lands and sign NRCA boundary where appropriate. Avoid leading NRCA visitors to locations that would encourage trespass on private land when developing or enhancing a trail system for public use.
 - Analyze hunting and fishing with respect to safety, ecological impacts, and user conflicts in the Mount Si Public Use Plan. Work with the Department of Fish and Wildlife to determine if current hunting, fishing and trapping regulations are appropriate within the NRCA.
 - Evaluate proposals for exploration and development of minerals, oil, and gas not owned as part of the NRCA, including trust-owned minerals, for environmental sensitivity. No open pit mines will be allowed; subsurface operations should be accessed from outside the NRCA with little or no surface disturbance in the conservation area.
 - Require that permits be obtained from the DNR for scientific research, large group activities, or other special events. Large group activities and special events include any event involving more than 12 participants which is advertised in advance, sponsored by any individual or organization, and conducted at a predetermined time and place within the NRCA.
 - Provide adequate facilities (garbage and sanitation) where needed and appropriate.

Management Prescriptions by Land Unit

The NRCA is divided into seven unique land units based on watershed boundaries, ecological quality, sensitive areas, amount of disturbance, habitat potential, and current use. Each land unit provides unique management opportunities and restraints (Figure 6). Specific recommendations on public use are further defined in the Public Use Plan.

In addition to the general management goals as outlined above for the entire NRCA, the DNR will carry out the following recommendations for each Land Unit.

LOWLANDS UNIT

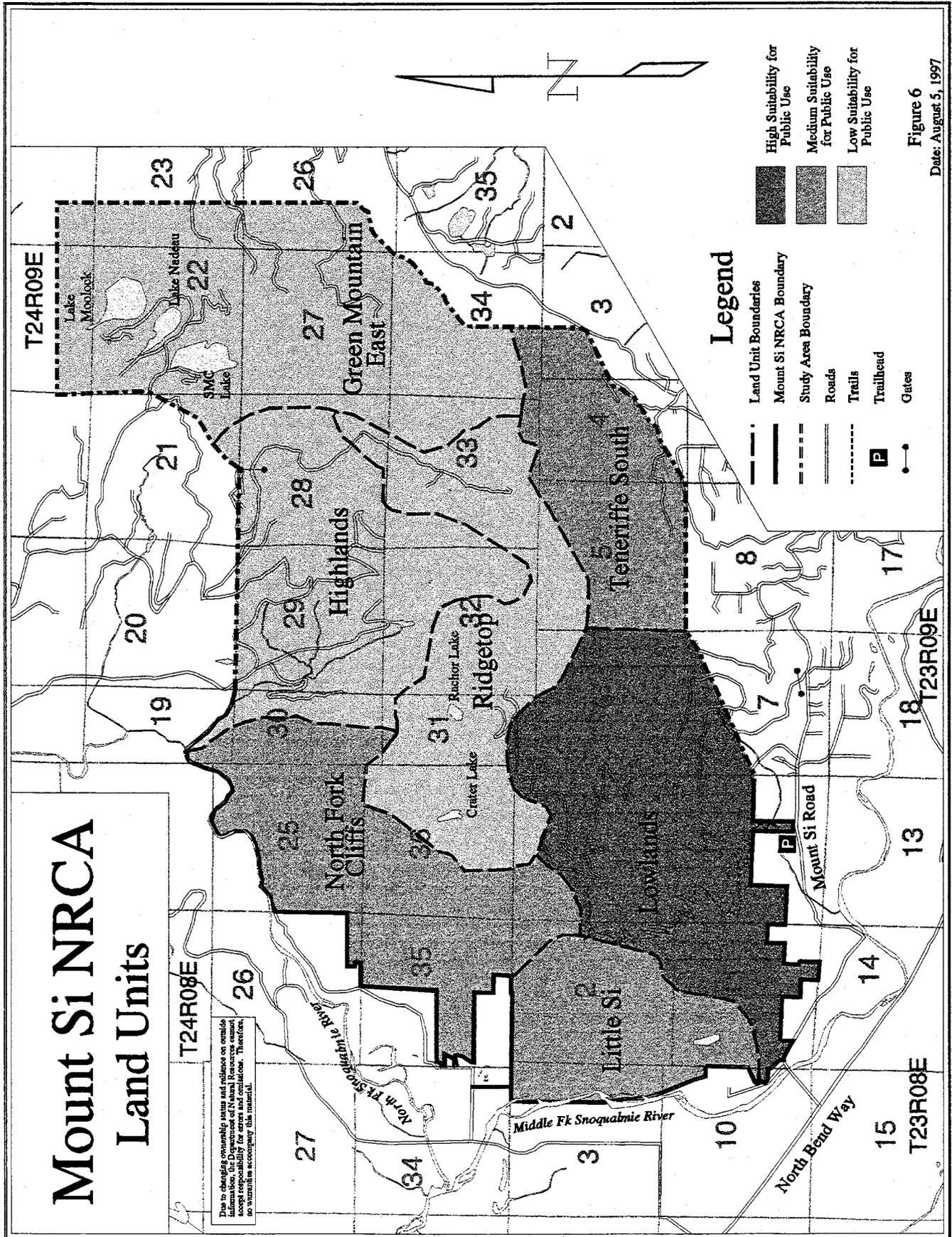
This area has over 2,000 acres which includes the Mount Si summit and the popular Mount Si trail which climbs 3,200 feet. There is a small area of old growth at the mid point of the trail with an interpretive boardwalk. The Tenerife Road is within this area.

The main management emphasis in this unit is on accommodating public use without adversely affecting the natural environment. Public use should be concentrated in this unit due to the lack of significant sensitive resource areas, the absence of substantially disturbed landscape, moderate to high capability soils, the existing developed Mount Si trailhead, and the maintained management road.

Management Prescriptions for the Lowlands Land Unit:

- Maintained management road will remain closed and gated to restrict motorized access. Access is allowed for management operations, private landowners or those with mining rights, and by special permit only.
- Mountain bikes and horses are allowed on maintained management road to prevent trail or off-road degradation and to minimize conflicts with other users. Horse and bike access should be evaluated for impacts over time.
- The two cleared areas along the new Mount Si trail used as resting spots (at approximately one mile and at four miles) should be defined and equipped with benches so that further site damage does not occur. These areas should be evaluated for educational opportunities.
- Public use should be channeled through the meadow at the summit on the Mount Si trail to minimize damage to sensitive grass balds and rock outcrops. Interpretive signs should be posted to educate visitors that they should hike only on the trail, to protect fragile vegetation. Restore areas that have been devegetated.
- Signs should be posted at the "haystack," warning of risk of climbing. Eroded areas should be stabilized. Additionally, no pets should be allowed on the haystack to minimize the damaging effects of scrambling, and to minimize conflicts with other users in a particularly constrained area.

Figure 6: Land Units



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- The hang gliding launch site from the landing facing northwest should be monitored to ensure that further degradation of the area is not occurring.
 - Construction of a loop trail connected to the main Mount Si trail should be considered to reduce degradation and traffic on the main trail and to create diversity in the recreational experience.

LITTLE SI UNIT

The Little Si Unit has 880 acres and includes the Little Si trail to the summit of Little Si. This trail is popular with families and rock climbers. There are several well used climbing rocks in this area. To access the Little Si trailhead, users must park in a small gravel parking lot and walk 1/4 mile through a neighborhood. There is a wetland, several streams, and numerous grass balds in this unit.

Due to the moderate capability soils and existing trail system, major management emphasis in this unit is on environmental education and low-impact recreation, with particular emphasis on opportunities for families.

Management Prescriptions for the Little Si Unit:

- A solution to the Little Si trail head access that avoids or minimizes impacts to neighbors should be vigorously pursued. This includes evaluating alternative access sites, working with other agencies to promote alternative hikes, and educating users on courteous conduct.
- The Department should continue to work with local rock climber groups to ensure that sensitive rock outcrops and grass bald areas are not impacted. Monitoring and stewardship of the area should be further defined in the Mount Si Public Use Plan. Climbing activities should be monitored, and restrictions applied if needed. Restoration work and educational signage should be completed by user groups.
- Public uses including facilities, trails, access points, and uses should be further evaluated in the Mount Si Public Use Plan.

RIDGETOP UNIT

This area of 1,610 acres is the most sensitive unit in the NRCA with extensive areas of erodible soils, sensitive meadows, lakes and old growth remnants. Crater and Racher Lakes are highly significant to the Snoqualmie tribe. Crater lake is in excellent ecological condition with little disturbance.

This unit should be managed to preserve its habitat values. Activities permitted within the area reflect the emphasis on the protection of natural resources. The area has extremely low suitability for human activity.

Management Prescriptions for Ridgetop Unit:

- Access to the Ridgetop Unit should be limited to protect sensitive natural resources and landscapes. Access points to the area should be carefully evaluated for potential impacts.

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- The two lakes should be closely monitored to ensure against trampling and degradation. Fish stocking at Crater Lake has been discontinued. Stocking of fish in Rachor Lake should also be closely monitored to prevent future damage to the native lake ecosystems. Work directly with the Washington Department of Fish and Wildlife to manage the lake ecosystem. Additional baseline studies should be conducted to determine impacts of stocking.

The following four Land Units have received less analysis than other, more used and easily accessible areas of the NRCA. The general management goals and strategies apply to these areas. The following is a description and a management focus for each of these areas. It is likely that site specific management goals will be developed as more is known about each unit. Public use issues will be evaluated in the Public Use Plan. However, no new access will be provided to these areas until more information is gathered.

HIGHLANDS UNIT

This 1,743-acre area has been highly disturbed and contains numerous abandoned logging roads. There are sensitive rock outcrops, meadow habitat, and old growth forest remnants.

The management emphasis for this unit is protecting natural resources and sensitive rock outcrops, meadow habitat, and old-growth remnants. The unit can serve as a buffer for the more sensitive Ridgetop Unit.

GREEN MOUNTAIN EAST UNIT

At 2,461 acres this is the largest land unit in the NRCA. It contains meadow and rock habitats, old growth forest remnants and erodible soils. There are disturbed areas including closed and abandoned roads. Within the boundary but not owned by the DNR are three lakes, SMC, Moolock and Lake Nadeau. These lakes are highly significant to the Snoqualmie tribe.

The Green Mountain East Unit should be managed primarily for natural resource and habitat values due to the presence of several disturbed areas. Restoration opportunities should be evaluated. Connections to the Middle Fork Snoqualmie area require further evaluation in the Public Use Plan.

TENERIFFE SOUTH UNIT

This area of 986 acres includes a sensitive ridgeline and rock outcrops at high elevations. There are fewer sensitive features at lower elevations.

This area should be managed in the same manner as the Green Mountain East Unit, primarily for natural resource and habitat value protection. After further study the area could be developed for controlled future educational and recreational opportunities, particularly at lower elevations, if future use levels in the unit require channeling into hardened areas and/or use levels in the Lowlands Unit exceed sustainable levels.

NORTH FORK CLIFFS UNIT

This area includes the massive western facing cliff faces of Mount Si. Mountain goats frequent this Land Unit at mid and high elevations. Elk are found in the lower elevations. The cliffs are habitat for the peregrine falcon — a federally endangered species. Peregrine have been sighted using the area for soaring and mating. There is little disturbed area in this unit.

The main management focus for this unit should be on protecting resources while accommodating low levels of low-impact public use.

Regulation, Enforcement and Fire Management

Regulation, enforcement and fire management are important aspects of effective implementation. Adequate access and guidance for fire management, emergency response and law enforcement are necessary.

Because of threat of wildfire escape to surrounding private forest lands and surrounding residential development, wildfires within the NRCA will be extinguished. The Department should consider the primary goals and most sensitive resources of the NRCA in choosing fires suppression techniques, including location of control lines, role of equipment, use of chemical retardants, location and extent of mop-up, and type of mop-up activity. Natural resources should be protected wherever possible. Sites should be left in a “natural setting” including effects from natural events. Mop-up activities should be limited to using water and hand tools. Any activity that could produce slumping or increased sedimentation into wetland or shore areas should be avoided. Any activity that would significantly alter the flow of water into or out of the wetlands, lakes, or streams should also be avoided. Fire suppression activity should make use of plain water, “wet water” (or water containing similar wetting agents), or foam. Retardants may also be appropriate in order to protect sensitive areas and private lands. Helicopters should be used whenever possible. Mechanized equipment should be limited to roads. The DNR is responsible for enforcement of fire regulations on the NRCA. The DNR should cooperate with King County Emergency Services to provide adequate emergency response under the same guidelines as fire response.

DNR will be responsible for enforcement actions on the NRCA. Enforcement measures should emphasize non-confrontational techniques and voluntary compliance. Education programs may help reduce conflicts among user groups. Where certain uses are not permitted, informing visitors where these activities are permitted may help to reduce the number of violators. Because enforcement of regulations is integral to the effective implementation of recommendations made in this plan, funding for enforcement should be pursued to meet program goals.

Interagency Coordination

Many of the stewardship recommendations outlined in this document involve coordinated efforts between land managers, scientists, recreationists, community organizations, the Mountains to Sound Greenway Trust, neighbors, and local, state, and federal agencies. Coordination between agencies may prove valuable in making land acquisitions, in sharing mapping capabilities and data, in performing baseline studies of vegetation and wildlife, in recreation planning, and in overall regional planning. Wildlife connections are of particular importance in these corridors in sharing biological diversity between the areas by allowing greater wildlife movement throughout the region.

Among the agencies with which DNR should coordinate are the US Forest Service, US Fish and Wildlife Service, Washington State Department of Fish and Wildlife, and Department of Ecology, King County, and the City of North Bend.

DNR has assigned a staff member the responsibility of overseeing coordination efforts on the NRCA. Effective coordination requires establishing working relationships with coordinating agencies; if DNR can address this issue at the outset, implementation of stewardship recommendations may prove easier, less costly and more effective.



Monitoring Program

Purpose

The purpose of the monitoring and evaluation program is to track changes in the NRCA, to ensure that recommended management prescriptions are being followed, and to ensure that stewardship activities are being implemented successfully. Detailed monitoring plans should be developed before stewardship activities and site development proceed.

Monitoring Objectives

Future monitoring of the NRCA will be guided by the following objectives:

- Maintain the natural diversity of plant and forest communities, with emphasis on the development and continuation of highly structured coniferous and multi-species deciduous woodlands, and a variety of wetlands.
- Maintain the natural level of diversity in both aquatic and terrestrial species.
- Educate users about restoration and monitoring efforts.
- Ensure that user safety and preferences of various user groups are accommodated to the extent practicable.

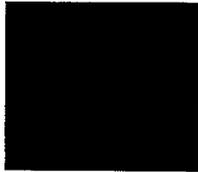
Monitoring Tasks and Indicators

Monitoring activities should be carried out based on overall NRCA program goals as well as specific conditions on the NRCA. Monitoring tasks should be prioritized, as follows, to help decide which monitoring activities should be implemented based on funding and staffing limitations.

- Activities should include addressing key gaps in ecological information, including TES and key indicator plant and wildlife species, priority habitats/vegetation communities, forest structure and understory vegetation, aquatic systems, and other characteristics.
- Monitoring should be conducted on ecologically sensitive areas identified in resource inventories, particularly on those areas that are degrading.
- Monitor non-sensitive areas and facilities, such as trails, roads, trailheads, and cultural and interpretive sites. DNR should utilize the expertise of its Natural Heritage Program to design monitoring activities based on future ecological studies.

Indicators should be selected to address monitoring objectives, to provide an early warning of change, to provide a continuous assessment over a wide range of impacts, to differentiate between natural cycles and change induced by low-impact public use, and to be cost-effective and relatively easy to implement. The following are examples of monitoring activities that could be used to track ecological conditions and visitor use on the NRCA; final selection of indicators will be made based on additional ecological information:

- Use vegetation transects to measure species occurrence and cover as well as successional change in plant community conditions.
- Use photographic recording from fixed points to measure change of the areal extent of plant community and wildlife habitat types.
- Maintain records of reported wildlife sightings.
- Map locations of nests.
- Document types and location of exotic plant species present and rates of invasion.
- Record the abundance of insects, annelids and other benthic organisms in aquatic communities and the effects of stocking of the lakes.
- Measure water quality parameters such as pH, turbidity, dissolved oxygen, nutrient levels, bacteria, temperature and heavy metals.
- Assess changes in the trail width, number of bootleg trails and rates of erosion through field checks and photographic recording and measurements.
- Use photographic recording to document visual changes from designated scenic viewpoints in the NRCA.
- Meet with agencies and interest groups to monitor activities on adjacent lands potentially affecting the NRCA.
- Document frequency of user conflicts and enforcement actions.
- Document frequency and type of damage to structures and facilities.
- Maintain regular contact with local educators and user groups. Record frequency and location of use of the NRCA for organized education programs.
- Perform user surveys on a periodic basis at specific locations that assess activity types, levels of use, and preferences.



Glossary

act (the): The legislation which created RCW 79.71.

buffer: An area that surrounds and protects an environmentally sensitive area from adverse impacts to the functions and values of that area.

capability: The tolerance of a resource to modification, human-induced or otherwise.

cultural resources: Archaeological and historic sites and artifacts.

deactivated: Road is gated and locked. Drainage control structures are put in place to minimize the chance of road failure. The road is more stable but more difficult to drive. Road is used by private land owners and land managers as little as possible. Repairs to the road will address environmental damage or safety concerns.

decommissioned: Road is removed and either restored completely or converted to a trail. Decommissioning may be phased.

ecosystem: All living components of a biological system.

enhance: To recreate one or more characteristics that existed on the site before alteration.

exotic: Any species of plants or animals that are foreign to the NRCA.

federal endangered species: A species in danger of extinction throughout all or a significant portion of its range.

federal threatened species: A species which is likely to become endangered within the foreseeable future.

federal proposed species (candidate): A species that is the subject of a proposed or final rule indicating the appropriateness of listing as threatened or endangered.

harden: To develop in such a way as to minimize public-use impacts to the surrounding natural ecosystem.

low-impact public use: Public recreation uses and improvements that do not adversely affect the resource values, are appropriate to the maintenance of the site in relatively unmodified natural setting, and do not detract from long-term ecological processes.

maintain: To keep in an existing state; preserve from failure or decline.

mitigation: Minimizing or compensating for adverse environmentally sensitive area impacts.

monitoring: The collection and analysis of data by various methods for the purposes of understanding and documenting changes in natural ecosystems and features.

native vegetation: Vegetation existing on a site, or plant species which are indigenous to the area in question.

NRCA: Natural Resources Conservation Area

RCW: Revised Code of Washington

restore: To reduce disturbance to the landscape.

state endangered species: Species native to Washington that are seriously threatened with extinction throughout all or a significant proportion of their ranges within the state.

state threatened species: Species native to Washington that are likely to become endangered within the foreseeable future throughout significant portions of their ranges within the state without cooperative management or the removal of threats.

state sensitive species: Species native to Washington that are vulnerable or declining and are likely to become threatened or endangered in a significant portion of their ranges within the state without cooperative management or the removal of threats.

stewardship: Management activities that are intended to maintain, restore, or enhance ecosystems.

streams: Those areas where surface waters flow sufficiently to produce a defined channel or bed.

TES: Threatened, Endangered, and Sensitive species

WAC: Washington Administrative Code

wetlands: Lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface.

wildlife: All species of the animal kingdom whose species are native to Washington and exist in an undomesticated state.



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