NATURAL RESOURCES

Loomis Natural Resources Conservation Area Management Plan

Okanogan County
Washington

September 2005

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands

ACKNOWLEDGEMENTS

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Backcountry Horsemen, Okanogan Chapter
British Columbia Parks
Butte Buster Snowmobile Club
Cattlemen Association
Colville Confederated Tribes
Friends of the Loomis Forest
Goldhill Homeowners Association
Kettle Range Conservation Group
Loomis Forest Action Committee
Natural Resource Conservation Service
Northwest Ecosystem Alliance
Okanogan County Commissioners
Okanogan County Snowmobile Advisory Board
Okanogan Resource Council
Okanogan Public Utility District
Washington Department of Fish and Wildlife
White Stone Irrigation District
U.S. Forest Service
U.S. Fish and Wildlife Service
Yakama Indian Nation

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Cover: Lynx tracks in the snow within the Loomis Natural Resources Conservation Area (DNR photo)

Loomis Natural Resources Conservation Area Management Plan

Okanogan County
Washington

September 2005

(Plan Approved May 2003)

Prepared by

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WASHINGTON STATE DEPARTMENT OF
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Doug Sutherland - Commissioner of Public Lands

Doug Sutherland
Commissioner of Public Lands

May 29, 2003

Dear Reader:

I am pleased to present the Loomis Natural Resources Conservation Area (NRCA) Management Plan. The plan offers direction for the management and protection of natural ecological systems, and public use on approximately 24,700 acres in Okanogan County. The two parcels that we call the Loomis NRCA is the result of a public-private partnership that included raising private funds to conserve public land while at the same time continuing to offer opportunities for historic uses. Many people dedicated themselves to the open and collaborative two-year planning process. My hope is that the productive relationships that made this plan possible will continue throughout its implementation.

Sitting mostly above 5,000 feet in elevation, the two parcels of the Loomis NRCA are highly valued for their contribution to wildlife habitat. The lodgepole forests with pockets of alpine areas are home to several wildlife species considered rare in Washington. Another important characteristic of the site is that the Loomis NRCA came under Natural Areas Management with a long history of human use including livestock grazing, horseback riding and more recently, snowmobiling. The ecological characteristics and the public use opportunities contribute to the overall value of the NRCA.

The Loomis NRCA Management Plan is designed to coordinate conservation of the natural ecological values with recreation and other public uses. The plan addresses management issues and recommends management actions for maintaining vegetation and wildlife habitat while continuing to provide a variety of public uses. The management plan includes vegetation and trail maps, and monitoring and data collection needs. Also, management guidelines are provided to guide general land management decisions.

Many individuals and groups have worked together to make the Loomis NRCA a reality. Their contributions will be enjoyed and appreciated for generations to come. I encourage everyone to continue their involvement as we work to maintain the valuable natural features and variety of public use of the Loomis NRCA.

Sincerely,

Doug Sutherland
Commissioner of Public Lands

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PREFACE

This management plan fulfills requirements outlined in two legal documents (settlement agreement and memorandum of clarification) and the Natural Resources Conservation Areas (NRCA) Act, Chapter 79.71 RCW. It provides guidance for site-specific management of the Loomis NRCA.

Two parcels, now known as the north and south blocks of the Loomis NRCA, were transferred out of school trust status in January 2000 to fulfill part of the April 1998 Settlement Agreement between Northwest Ecosystem Alliance, Friends of Loomis Forest, The Mountaineers, Kettle Range Conservation Group, Washington Environmental Council and Gerald Henderson, and the Washington Board of Natural Resources.

A First Memorandum of Clarification (December 1998) followed the Settlement Agreement and specified that the parcels would remain in state ownership and be managed as a "conservation management area" under the Natural Resources Conservation Areas Act (RCW 79.71). Furthermore, the Memorandum of Clarification states that "a management plan for the Loomis NRCA will be developed under Chapter 79.71 RCW to coordinate conservation of the property's natural ecological values with traditional agricultural management (cattle grazing) and recreation activities."

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I. INTRODUCTION

A. The Department of Natural Resources

The Loomis Natural Resources Conservation Area (NRCA) is one type of land designation managed by the Department of Natural Resources. The Department, led by the Commissioner of Public Lands, manages more than 3 million acres of state-owned trust forest, agricultural, range lands and commercial properties. These lands earn income to build schools, universities and other state institutions, and help fund local services in many counties. In addition to earning income, trust lands protect public resources such as water and habitat for native plant and wildlife species, and provide opportunities for public recreation and outdoor environmental education statewide.

Washington Natural Areas [Natural Resource Conservation Areas (NRCA) and Natural Area Preserves (NAP)] are managed for conservation purposes. They protect unique and threatened native ecosystems, and offer educational and research opportunities. NRCAs also provide opportunities for low-impact public use. Natural Areas make up less than 2% of the land managed by DNR.

Natural Areas Program

Within DNR, the Natural Areas Program manages NAPs and NRCAs. Staff in region offices and at headquarters in Olympia work to maintain the features for which the natural areas were established and keep the sites in the best ecological condition possible. The Natural Areas Program manages 29 NRCAs (including the Loomis NRCA) and 50 NAPs throughout the state. Special features found in NAPs and NRCAs include: coastal rainforests, grasslands, salt marshes, Ponderosa pine forests, bogs, sagebrush communities, scenic vistas of the Columbia River, active nesting sites for bald eagle and peregrine falcons, and habitat for the basalt daisy, the Puget blue butterfly, Oregon spotted frog, Canada lynx and grizzly bear.

B. Site Location/Loomis State Forest

The Loomis NRCA is part of the Loomis State Forest located west of Tonasket in Okanogan County, Washington (Loomis NRCA & Vicinity Map, Figure 1). The Loomis Forest includes three land designations: trust land, Natural Area Preserve and Natural Resources Conservation Area. While the Loomis NRCA has a specific designation that differentiates it from the Chopaka NAP and the Loomis State Forest, DNR is responsible for all three areas as a whole. Endangered species habitat, late successional forest, public use and resource protection may be analyzed or coordinated across the Loomis Forest as a whole while site-specific management activities follow the goals and objectives outlined in the associated management plan.

The Loomis NRCA consists of two parcels; the north block is located in Township 40 North, Range 24 East, W.M. and the south block is located in Townships 37 & 38 North, Ranges 23 & 24 East, W.M. (see Appendix A for a complete legal description). The two Loomis NRCA parcels are surrounded by public land: national forest, Bureau of Land Management, state forest, state natural area preserve and a protected area in Canada.

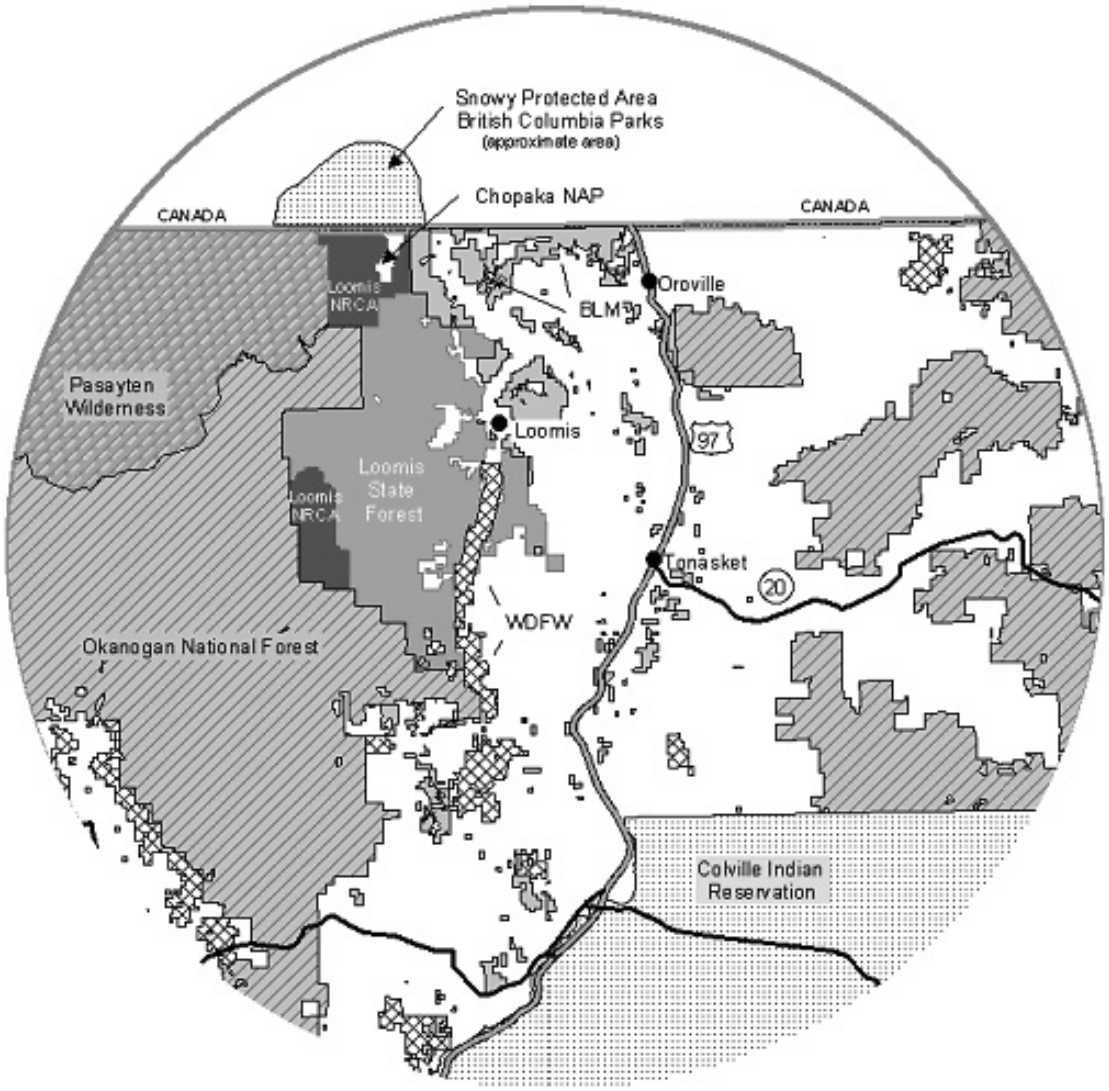
C. General Site Description

The Loomis NRCA is one of the largest NRCAs in the state. It covers approximately 24,700 acres (14,000 acres in the north block, 10,700 in the south block). The Loomis NRCA includes mountains draped with vast forests of lodgepole pine and valleys with wet meadow and streams. Other types of vegetation include Engelmann spruce, quaking aspen, Douglas fir and, mid-elevation and alpine meadows. Fire rejuvenates the lodgepole forests and is most frequent in the dry summer months. Most of the precipitation occurs in the winter months as snow. Past natural fire events created thousands of acres of even-aged lodgepole forests including the forests within the NRCA. As a result, acres of trees aged at the same time and became host trees to native bark beetles. The natural accumulation of woody material combined with hot, dry, windy weather create conditions for another fire cycle. Heat from the high intensity fire release seeds for the next generation of lodgepole pine. Current law mandates the suppression of all uncontrolled fires thus, interruption of the fire cycle may occur as a result of fire suppression.

Species of special concern include twelve plant species and nine wildlife species (grizzly bear, Canada lynx, gray wolf, wolverine, northern goshawk and four butterfly species) ranked as critically imperiled, vulnerable to extinction or rare in Washington State. Habitat for these species exists within the NRCA. Areas of specific sensitivity include meadows, wetlands, riparian areas, aspen forests, talus subalpine cirque basins and subalpine/alpine meadows.

The Loomis Forest area was first known by Native American tribes now represented by the Colville Confederated Tribes and the Lower Similkameen Indian Band. During and after European settlement the area that is now the Loomis NRCA was used by trappers and, sheep and cattle herders. Present day uses include cattle grazing, hunting, recreational equestrian use, hiking, snowmobiling, snow-shoeing and cross-country skiing.

Figure 1. Loomis NRCA and Vicinity



Okanogan County

BLM - Bureau of Land Managment
WDFW - Washington Department of Fish and Wildlife

Loomis NRCA Management Plan
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D. Management Policy and Legal Requirements

The land transfer of the Loomis NRCA was directed by the April 1998 Settlement Agreement between the Board of Natural Resources and the Northwest Ecosystem Alliance, et al. and the First Memorandum of Clarification dated December 16, 1998. The Settlement Agreement specified the two parcels to be transferred out of Common School Trust and the Memorandum of Clarification specified that the parcels would be managed by the state under the Natural Resources Conservation Areas Act.

First Memorandum of Clarification

The following clarifications, related to land management, were made to the initial Settlement Agreement dated April 7th, 1998.

- The specific boundaries of land transferred from trust status to NRCA will not be subject to expansion nor extend beyond or outside of the boundaries established at the time of the land transfer.
- The ecological significance of the transferred parcels will be protected and the parcels will be managed to prohibit commercial logging and non-emergency road building and, to allow low-impact public use and agricultural activities to continue.
- Following the land transfer, a management plan for the two parcels will be developed under RCW 79.71 (NRCA Act) to coordinate conservation of the natural ecological values with traditional agricultural management and recreational activities. Broad based public participation will be solicited in the development of the management plan.
- The primary purpose for the land transfer was to maintain the land in the most natural condition possible to provide habitat for native wildlife, including wildlife requiring roadless areas, and wilderness recreational opportunities.
- Grazing activities on the transferred parcels permitted by valid grazing leases and permits (five permit ranges overlap with the NRCA) encompassing the parcels, including renewals and extensions will be unaffected by the land transfer and will be allowed to continue, provided, however, that such grazing activities remain in compliance with the "Ecosystem Standards for State-Owned Agricultural and Grazing Lands"(HB 1309), are in compliance with the specific Coordinated Resource Management plan (CRMP) developed for each permit range located within the NRCA, are in good standing with the leasing and permit requirements, and are in full compliance with the Settlement Agreement.
- Existing, traditional and appropriate low-impact recreation uses, including snowmobile, and equine activities, will continue on the parcels. The management plan will identify existing snowmobile, equine, and hiking trails for continued public use.

Natural Resources Conservation Areas (NRCA) Act

In the late 1980s, the Washington State Legislature found an increasing and continuing need by the people of Washington for certain areas of the state to be conserved, in rural as well as urban settings, for the benefit of present and future generations. Consequently, the Washington State NRCA Act, Chapter 79.71 of the Revised Code of Washington (RCW), was enacted in 1987. To be considered for NRCA designation, land and/or water should have important ecological, geological, cultural or scenic characteristics and opportunities for low-impact public use and outdoor environmental education.

The Statewide Management Plan for NRCAs provides guidance for the management of and plan development for NRCAs. The primary purpose of NRCAs is to protect ecological systems, habitat, and scenic landscapes, thus natural resource–oriented purposes have priority over public-oriented purposes such as: low-impact recreation and environmental education (hiking, nature study, photography, picnicking, interpretive tours, scientific research etc.).

The Loomis NRCA is managed under the NRCA Act, however it is unique in that snowmobiling, equestrian activities and cattle grazing are permitted uses and will continue on the site. These uses are permitted in order to meet requirements developed specifically for the Loomis NRCA and "in no event shall these uses on the Property (the NRCA) be deemed a precedent for allowing similar uses in other NRCAs (First Memorandum of Clarification 1998)." To the extent possible, while maintaining traditional public use, natural resource-oriented purposes will be given priority over the public-oriented purposes.

NRCA management goals include:

- Maintain, enhance or restore ecological systems, including but not limited to aquatic, coastal, montane, and geological systems, whether such systems are unique or typical to Washington state;
- Maintain exceptional scenic landscapes;
- Maintain habitat for threatened, endangered, and sensitive species; and
- Provide opportunities for low-impact public use, scientific research and outdoor environmental education.

E. Purpose of this Plan

The purpose of this plan is to coordinate conservation of the property's natural ecological values with traditional uses. This plan is intended to guide management activities for both blocks of the Loomis NRCA. Several other plans play an important role in the management of the Loomis NRCA and rather than reiterate those plans, this plan should be used in conjunction with them. See the following section for a list and description of related plans.

DNR will implement the management recommendations as funding becomes available. Furthermore, budget requests for maintenance, monitoring and operations will be based on the objectives and actions of this plan.

F. Relationship to Other Plans

DNR Loomis State Forest Landscape Plan (1996)

The Loomis Forest Landscape Plan (DNR 1996) was developed to manage forest resources (timber, water, wildlife habitat etc.) for trust land. It will be updated so that it is consistent with this plan. The Landscape Plan is designed to ensure long term productivity of trust assets while addressing a range of environmental and public use resources to the extent that their protection is consistent with the department's trust obligations. Resources covered in the Landscape Plan include: air, archaeological and historical elements, fish, grazing land, mineral, recreation areas, soil, timber, water and wildlife.

Many of the resources addressed in the Loomis Landscape Plan are managed across the three land designations of the Loomis Forest. DNR is held accountable for all lands that it manages and cannot legally differentiate between land designations when considering regulatory actions, cumulative impacts, and habitat needs for listed species. As a result, habitat analysis and delineation, such as mapping lynx habitat and late successional forest, may be performed across the Loomis Forest as a whole, while management activities follow management plans associated with individual land designations.

DNR Resource Management Plans for Permit Ranges (2002)

Five permit ranges (Chopaka, Toats Coulee, Cecile, Sarsapkin and, Salmon Meadows) overlap with the NRCA (Figure 2. Permit Ranges). Each permit range has a Resource Management Plan that describes the management objectives and practices used to implement livestock grazing.

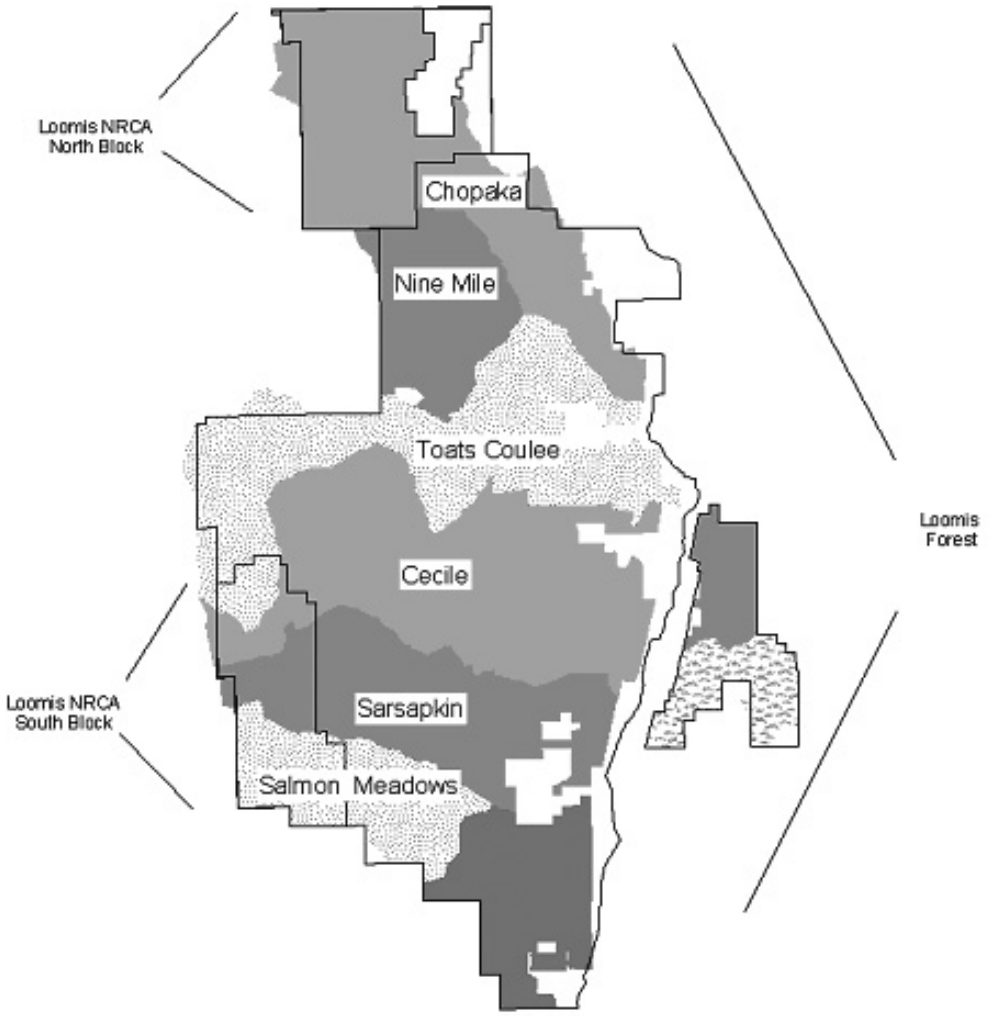
In 1993 the legislature passed HB1309 which directed the Department of Fish and Wildlife to develop goals for the wildlife and fish that the agency manages, to preserve, protect, and perpetuate wildlife and fish on shrub steppe habitat, or grazeable woodlands (excerpt from HB1309). A technical committee under the guidance of the Washington State Conservation Committee was charged with developing standards (HB 1309 Ecosystem Standards for State-owned Agricultural and Grazing Land) to achieve the goals developed by the Department of Fish and Wildlife. Both Washington Departments of Fish and Wildlife, and Natural Resources are required to implement practices to meet the Ecosystem Standards. Twenty-five Ecosystem Standards were developed and each one describes a desired ecological condition and includes a strategy, a rationale/discussion section and possible management practices.

As land managers, DNR staff work with permit holders to incorporate best management practices into the Resource Management Plans for Permit Ranges to meet the HB1309 Ecosystem Standards. The Resource Management Plans

cover the whole permit range regardless of land designation, thus this plan (Loomis NRCA Plan) does not include specific range management practices. Instead, Natural Areas staff participate in the development of the Resource Management Plans.

Range permits are renewed through a collaborative process between the permit holder, DNR trust land managers and Natural Areas Program staff, and the Natural Resources Conservation Service. As a result, the Resource Management Plans will serve as the primary management document for grazing activity in the Loomis NRCA.

Figure 2. Permit Ranges



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DNR Modified Lynx Habitat Management Plan (June 2002)

Canada lynx was listed as threatened in the state of Washington in October 1993 by the Washington State Wildlife Commission. In April 2000 Canada lynx was listed as threatened by the U.S. Fish and Wildlife Service (USFWS). DNR manages land in each of the six Lynx Management Zones defined by the Washington Department of Fish and Wildlife. The Okanogan Lynx Management Zone is the largest zone. Three Lynx Analysis Units (LAUs) overlap with the Loomis Forest and the Loomis NRCA (Figure 3, Lynx Analysis Units).

DNR developed the Lynx Habitat Management Plan in 1996, in collaboration with Washington Department of Fish and Wildlife, to respond to the state listing of the species. In May 2002 DNR modified the Lynx Habitat Management Plan to incorporate additional mitigation measures agreed to by the USFWS (Martin, April 26, 2002). These measures are intended to help ensure compliance with the Endangered Species Act.

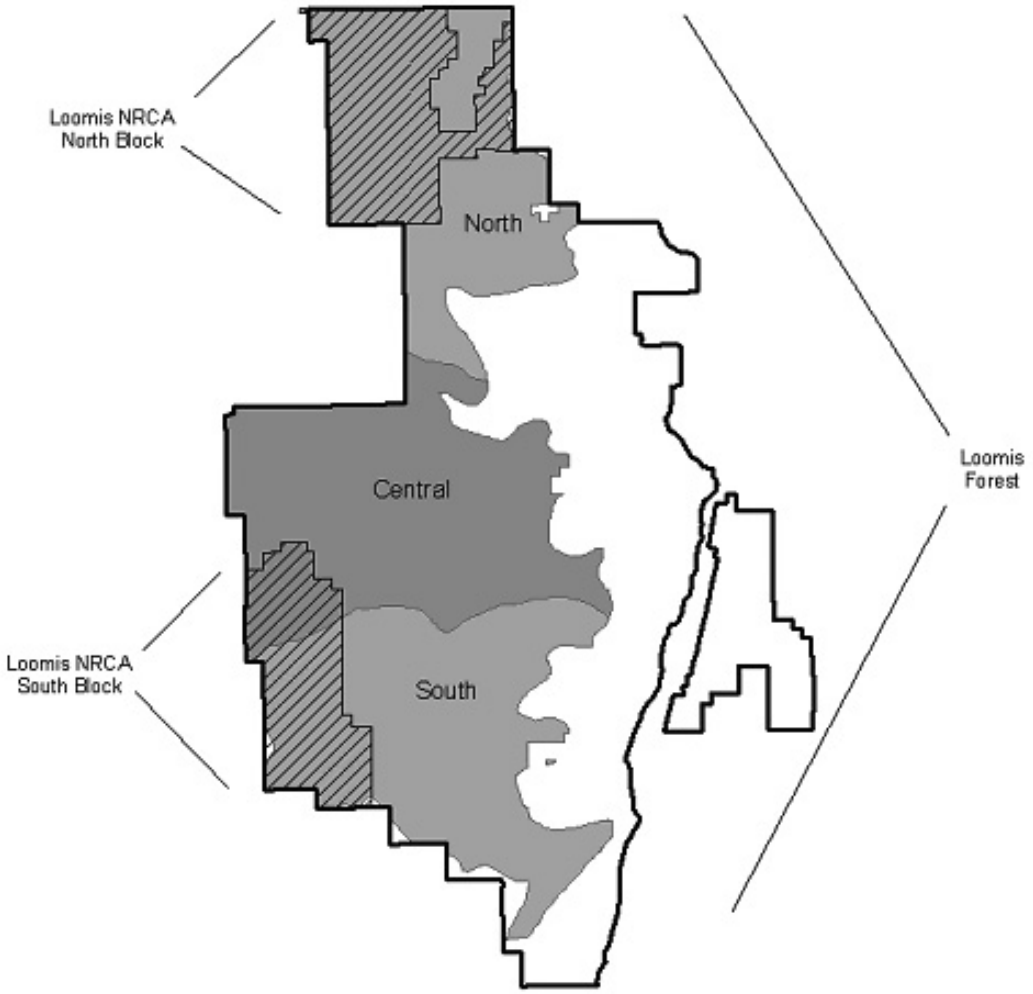
The original Lynx Plan outlines DNR's commitment to incorporate lynx habitat associations into its timber management plans and was written prior to the designation of the Loomis NRCA. The newly designated Loomis NRCA will continue to play a role in the implementation of the Modified Lynx Habitat Management Plan. The Modified Lynx Habitat Management Plan, along with any subsequent changes to the Plan that are needed to incorporate new research for protection of the lynx, will remain the primary management document to guide lynx habitat management within the NRCA.

Federal Grizzly Bear Recovery Plan (1993)

The grizzly bear is listed by the federal government as threatened in the state of Washington (US Fish and Wildlife Service 1993) and by the state as endangered (Washington Department of Fish and Wildlife 2002). The Grizzly Bear Recovery Plan written by the U.S. Fish and Wildlife Service in 1993 guides grizzly bear recovery. The recovery plan delineates six Recovery Ecosystems, of which the North Cascades Grizzly Bear Ecosystem is the second largest and includes the Loomis NRCA. A supplemental chapter was developed to specifically address grizzly bear recovery in the North Cascades and was added to the Grizzly Bear Recovery Plan in 1997.

Washington's portion of the North Cascades Grizzly Bear Ecosystem is subdivided into 54 Bear Management Units (BMUs) and the Loomis NRCA is located in the Upper Toats BMU. Thus, the Grizzly Bear Recovery Plan will guide the management of grizzly bear habitat within the Loomis NRCA (US Fish and Wildlife Service 1993).

Figure 3. Lynx Analysis Units (LAUs)



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G. Adjacent Land

The Loomis NRCA is surrounded by forested public land (Loomis NRCA and Vicinity Map, Figure 1). Management of the adjacent land is described below.

Common School Trust Land, DNR

The largest land designation within the Loomis State Forest is managed to produce revenue for the Common School Trust. Timber is harvested according to the Loomis State Forest Landscape Plan (1996). The plan describes a transition from current conditions to desired future conditions and includes objectives for producing revenue from timber harvest.

General objectives include:

- To generate long-term income for the trust beneficiaries, given the legal, biological, and social constraints within which the forest must be managed.
- To create and maintain healthy, productive forest resources.
- To provide habitat that is capable of supporting healthy populations of native fish and wildlife.
- To provide recreational and other public benefits, consistent with trust obligations.

Chopaka Natural Area Preserve, DNR

The Chopaka NAP is nearly surrounded by the north block of the Loomis NRCA. The guiding principle for managing the Chopaka Natural Area Preserve (NAP) is to permit ecological and physical processes to predominate, while controlling activities that directly or indirectly modify them. The overall vision for the NAP is to protect natural diversity and maintain the site in the best condition possible for research and education. As a result access is limited to uses related to research and education.

DNR Chopaka NAP Management Plan (2002)

The NAP differs from the Loomis NRCA in that it offers a higher level of protection and is managed specifically for scientific research and education. Information regarding the NAP should be included on NRCA information signs to alert visitors of the sensitivity of the NAP. Additionally, the Chopaka Management Plan identified a specific need to enhance the visibility of the NAP boundary along the Disappointment Creek Trail (formerly known as the Jeep Trail) especially in winter months.

Snowy Protected Area, Canada Ministry of Forests

The northern boundary of the Loomis NRCA is adjacent to the Snowy Mountain Protected Area in Canada. Protected Areas are very similar to Washington State NRCAs in land management emphasis, in that they are managed to allow the site to

exist in the most natural condition possible while providing opportunities for low-impact recreation and outdoor environmental education. The majority of public use occurs in the northern part of the protected area and is oriented away from the NRCA.

The Snowy Protected Area protects a wide range of vegetation and wildlife from dry grassland valleys to extensive alpine meadows and supports a provincially significant herd of California bighorn sheep (B.C. Parks).

Okanogan National Forest, US Department of Agriculture Forest Service

The Okanogan National Forest covers approximately 1,706,000 acres and includes two Wilderness Areas: The Pasayten and the Lake Chelan-Sawtooth. The area is famous for its mule deer herds and sports fisheries. It has numerous small campgrounds and approximately 1,600 miles of trails making it a popular place for cross-country skiing, snowmobiling, hiking, mountain biking and horseback riding (USDA Forest Service).

The Pasayten Wilderness is adjacent to the western boundary of the north block and is closed to motorized and mechanized use. A valid federal grazing permit overlaps with the Wilderness Area and also is adjacent to the Chopaka Permit Range in the north block of the NRCA. Horseback riding is permitted in the Pasayten Wilderness Area and it is common for equestrians to ride between the Wilderness Area and the NRCA. Snowmobiles however, are not permitted in the Wilderness Area. Fire is recognized as an important element in maintaining the natural ecosystem in the Wilderness Area and the Pasayten Wilderness Area Fire Plan focuses on managing natural fire rather than immediate suppression. DNR is required to suppress uncontrolled fires thus DNR staff will continue to work with the Forest Service to coordinate fire suppression response and tactics.

USFS lands adjacent to the south block have a specific set of guidelines for winter motorized vehicle use. DNR will continue to coordinate with USFS to manage winter use across administrative boundaries.

Chopaka Mountain Wilderness Study Area, Bureau of Land Management (BLM)

Approximately 3½ miles of the east boundary of the north block is adjacent to land managed by BLM. The remote area, known as the Chopaka Mountain Wilderness Study Area consists of cliffs and talus sloping away from the Loomis NRCA and based on its wilderness characteristics, was reviewed in 1982 to determine if it is a suitable site for preservation as wilderness. To date, Congress has not acted on public lands reviewed for wilderness characteristics and in the meantime, the Secretary of the Interior must manage the Chopaka Mountain Wilderness Study Area in a manner that will not impair the area's suitability for preservation as wilderness (BLM 1982).

The Chopaka Mountain Wilderness Study (BLM 1982) identifies a preferred alternative based on the concept that the site is not suitable for wilderness designation. However,

most of the site would be designated as an area of critical environmental concern[1] and managed to enhance mountain goat habitat. A Research Natural Area in the upper part of the Anderson Creek drainage would be designated to protect a representative whitebark pine-subalpine fir forest and plants proposed for or listed as threatened or endangered in the state of Washington (see Appendix B for species list) (BLM 1982).

Livestock grazing would continue with adjustments made based on monitoring vegetative condition and trend. The area would also be open for hunting, camping, hiking and other recreation activities that would not result in unnecessary or undue degradation of the environment. Timber may be harvested on 385 acres (7% of the site) located in the central part of the site along the east boundary.

H. Management Planning Process

Work on the planning process for the Loomis NRCA began in the spring of 2001. The public process began in September 2001 with an open house in Tonasket. The NRCA planning process was one of five planning projects introduced at the open house. A coordinated planning process was designed to serve all five of the planning projects. Six public workshops (held approximately every 3-4 months) were included in the Loomis NRCA public outreach process and at each workshop the public had an opportunity to receive information about and make comments on the Loomis NRCA.

In addition to the public workshops, DNR staff were available to meet with individuals and special interest groups individually. Most of these meetings occurred during the fall of 2001 through early Fall of 2002. DNR staff met with representatives of groups (including site visits), public meetings, phone calls and attended group meetings.

The following is a general chronology of the establishment of the Loomis NRCA and the plan development process.

1998	Settlement Agreement identified two parcels for potential transfer from trust status. A First Memorandum of Clarification was signed at the end of the year and provided specific requirements concerning the designation and management of the parcels.
January 2000	Two parcels were transferred from trust status and designated as a conservation area. They are now called the Loomis NRCA.
April 2001 – August 2001	Internal pre-planning work.
Sept. 2001 – June 2002	Information gathering and preliminary development of the Loomis NRCA Fire Suppression Plan. Held four public workshops and several meetings with individual groups.

[1] Areas of Critical Environmental Concern is defined by the Federal Land Policy and Management Act as an area within the public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards.)

July 2002 – Nov. 2002	Development of the Loomis NRCA Management Plan. In November, the draft plan was made available for four weeks for public review and comment. Held the fifth public workshop and met with individual groups.
Dec. 2002 – Jan. 2002	Incorporated comments from the public and prepared the draft plan for the formal SEPA environmental review.
Jan. 22 – Feb. 2003	Formal comment period and public review of the draft plan. Held the sixth public workshop and solicited comments on the draft plan.
March 2003	Reviewed public comments, documented responses and submitted the final plan to the SEPA Responsible Official for final determination.
April 2003	Issued the Notice of Final Determination.

II. MANAGEMENT GOALS

The following management goals were developed using the First Memorandum of Clarification, the NRCA Act, and comments gathered during the scoping period.

- **Coordinate conservation of natural ecological values with outdoor environmental education, low-impact public use, snowmobile use, equestrian activities and livestock grazing.**

- **Maintain the parcels in the most natural condition possible.**

- **Protect examples of native ecosystems, habitat for threatened, endangered, and sensitive plants and wildlife, geologic features and scenic areas, and cultural resources.**

- **Comply with, the "Ecosystem Standards for State Owned Agricultural and Grazing Lands" and, the resource management plans developed for permit ranges located in the Loomis NRCA.**

III. SITE CONDITION/DISCUSSION MANAGEMENT ACTIONS

The following information was collected from existing reports, maps, databases, people familiar with the site and from site visits.

This section provides some basic information about the site and describes important biological features, natural processes and public use patterns. Most sections include a brief discussion of management issues followed by management actions designed to achieve the management goals of the NRCA.

Plant and wildlife information was gathered from agency biologists, the Natural Heritage database, Washington Department of Fish and Wildlife databases and past inventories of the Loomis Forest. Federal and state designations and, global and state ranks were examined to determine species rarity and degree of threat to its continued existence. Rare species that are highly threatened are addressed in this plan. See Appendix C for more information regarding federal and state status categories and, the global and state ranking system.

A. Physical Features and Conditions

This section provides general site information and does not include discussion or management objectives.

Geology

North Block

Geologic bedrock in the north block is comprised primarily of light-colored, crystalline, granitic rocks that have been assigned to three units. These include granodiorite and quartz monzonite of the Jurassic-age, Similkameen Pluton, possibly older but similar, light-colored crystalline igneous granitic rocks of the Loomis Pluton, and Tillman Mountain tonalitic orthogneiss. Orthogneiss is a metamorphic rock that started as an igneous rock but was subsequently metamorphosed through heat and or pressure changes. The Loomis Pluton and the Tillman Mountain tonalitic orthogneiss have been assigned a Triassic to Jurassic age and may predate the rocks of the Similkameen Pluton.

Nested or faulted to a position within this extensive package of granitic rocks are several smaller occurrences of older (pre-Jurassic) undifferentiated, high-grade metamorphic rocks and a suite of unusual rock types that have been assigned to the Chopaka intrusive complex including metagabbro and ultrabasic rocks.

The recognition and naming of many of these units comes from detailed geologic mapping of this part of the Okanogan range by Hibbard (1971), Rinehart (1981), and Rinehart and Fox (1972). DNR has published compilation geologic maps of the area at 1:100,000-scale (Stoffel 1990), and at a scale of 1:250,000 (Stoffel et al. 1991).

South Block

The south block of the NRCA is also primarily underlain by Mesozoic (Triassic-Jurassic) and younger Cretaceous igneous intrusive rocks. These units locally display metamorphic fabrics (foliation) or exist in packages of mixed igneous and metamorphic rocks. These igneous and metamorphic units are intruded to the east by a large pile of younger, Eocene-age volcanic and sedimentary rocks.

Glacier Activity

All of the bedrock units in the NRCA were extensively modified during the Pleistocene ice age when a continental glacial ice sheet blanketed much of North America. The maximum extent of the ice advance reached limits approximately 70 miles to the south of the NRCA. This continental glacial activity, along with local alpine glacial effects, has modified and shaped topography, including the removal of soils (unconsolidated material), and deposition of a variable mantle of glacially derived sediments throughout much of the NRCA.

Plate Tectonics

Speculation on the tectonic setting of the Okanogan range that underlies much of the NRCA has led to some interesting theories. Some authors have suggested that this area was derived in a series of Paleozoic and Mesozoic volcanic archipelagos. These landforms were then accreted onto the North American continent during the Late Triassic or Early Jurassic. Peripheral to or within these large blocks that docked with the continent were subsiding oceanic basins where exotic marine and volcanic terranes were developed. These eugeoclinal rocks were similarly scraped onto the continent or were pushed great distances inland along thrust faults. Volcanic activity (plutonism) and regional metamorphism accompanied accretion and persisted into the Late Cretaceous. Intrusion of plutonic rocks and deposition of sedimentary and volcanic rocks occurred during Late Cretaceous time and into Early Tertiary when tectonic forces are believed to have shifted from compression to regional extension. This theory is built upon geologic conditions that are represented in part by bedrock found in the NRCA as well as its position and relationship to adjacent rocks.

Minerals

All oils, gases, coals, ores, minerals, and fossils were retained for the Common School Trust as provided under RCW 79.01.224. The Loomis NRCA does not include any mining claims or prospecting leases.

Soils

Soils within the Loomis NRCA lie outside those areas mapped and described in the July 1980 Soil Survey of Okanogan County Area, Washington published by the United States Department of Agriculture, Soil Conservation Service (SCS). Site-specific soils

within the NRCA are described in the Washington State Department of Natural Resources (DNR) Geographic Information System (GIS).

In general terms, soils within the NRCA are typically deep to very shallow, mostly forest soils and rock outcrop on mountainous uplands. Soil mapping units consist of various specific soil phases within a variety of soil series. In some cases, multiple soil series characterize a given area. More developed soils occur on the flatter benches and terraces. These soils have formed in a mantle of volcanic ash and wind-blown silt (loess), overlying glacial deposits that overlie fresh to moderately decomposed granitic bedrock. Bare rock outcrop and regolith covered hillsides characterize the steeper gradient slopes and may include local accumulations of colluvium. Granitic intrusive igneous bedrock of the Okanogan range comprises much of this portion of northeast Washington, however smaller areas are comprised of more mafic-rich (iron/magnesium-bearing) igneous bedrock units (granodiorite to gabbro) and areas of heterogeneous metamorphic rocks.

Topography

The Loomis NRCA is part of the Okanogan Highlands located on the east slopes of the Cascade Mountain Range. The entire area was overridden by the continental ice sheet during the Pleistocene ice age with the possible exception of Chopaka Mountain (7,881 feet). Chopaka may have extended above the estimated elevation of the top of the ice at approximately 7,000 feet. These islands of land that lay above the top of the ice sheet are called nunataks. On Chopaka, unique flora and nunatak soils are protected in part by a DNR Natural Area Preserve.

Glacial modifications include rounded mountaintops, U-shaped valleys, glacial outwash terraces and lateral moraines. The north block is mountainous and includes Disappointment Peak (7,146 feet) and Snowshoe Mountain (7,823 feet). These mountains drain into creeks that leave the NRCA at an elevation of approximately 4,800 feet. Most the area drains to the south into the North Fork of Toats Coulee Creek and a small portion of the area drains north into Canada.

The south block includes several peaks that border the area and several creeks that drain into either Sinlahekin or Toats Coulee Creeks. The elevation ranges from approximately 7,000 feet to a low of 4,400 feet. The topography in the south block is similar to that of the north block.

Climate

The NRCAs are located on the eastside of the Cascade Mountains where the climate is warm and dry in the summer. Winters are cold and bring snow. Average annual precipitation in the two NRCA parcels is between 18 and 40 inches. Average yearly snowfall varies with elevation, but average up to approximately 100 inches at the highest elevations and represents the majority of the precipitation. Winters are cold and long with frost coming any month of the year and the ground is frozen from October to May with variations due to north or south aspect. Summers are short and dry with frequent electrical storms.

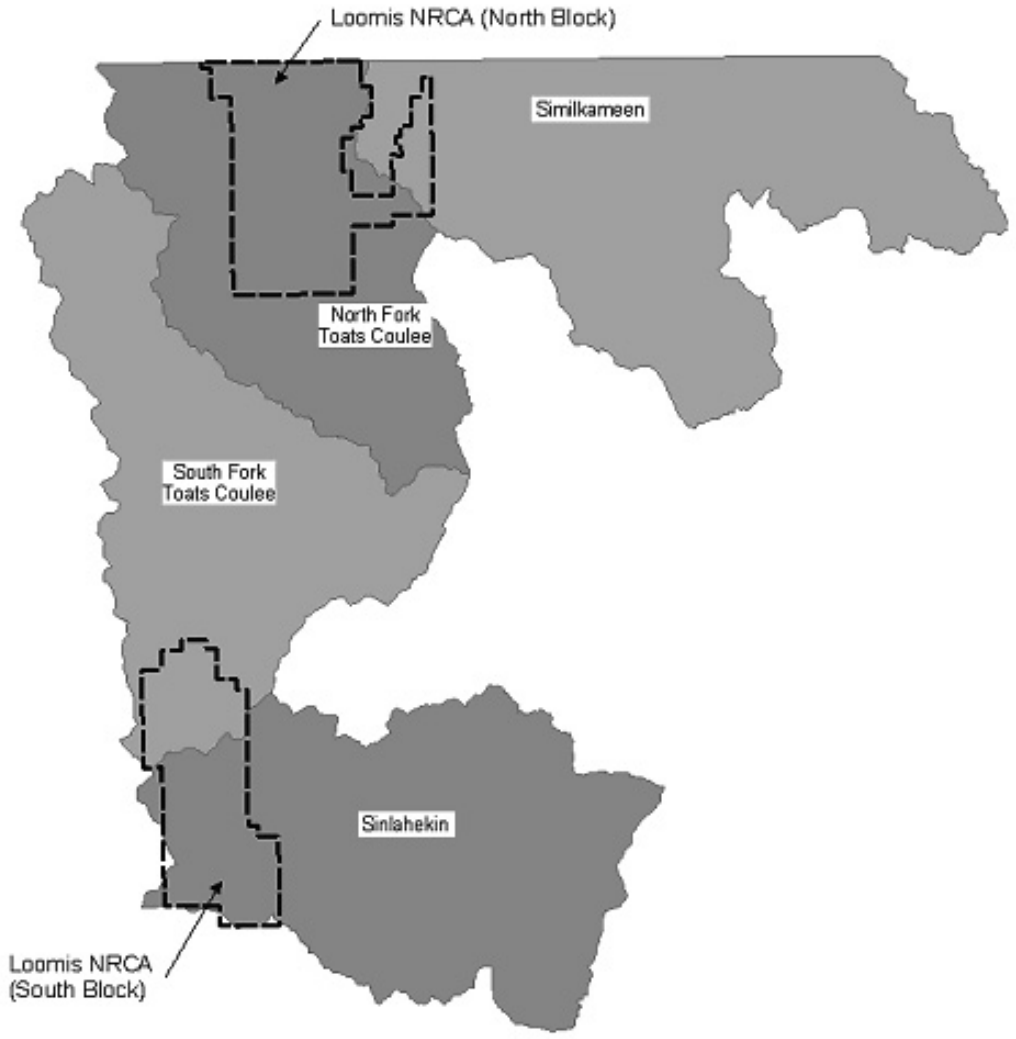
Winds are predominantly from the southwest or west most of the year, with periods of more northerly flow during the summer. Occasionally, strong winds develop from the east. Severe fire events throughout much of the Pacific Northwest are often associated with strong northerly winds or east winds during summer months.

Hydrology

The Loomis NRCA falls within three watershed analysis units (WAUs): North Fork Toats Coulee, South Fork Toats Coulee and Sinlahekin Creek (Figure 4, Watershed Analysis Units). The North Block drains mostly to the south into the North Fork Toats Coulee Creek; one (un-named) creek drains to the north into Canada. Headwater creeks include: Deer Park Creek, Little Horseshoe Creek, Snowshoe Creek, Olallie Creek, Swamp Creek, Disappointment Creek and Corduroy Creek.

The north half of the south block drains into the South Fork Toats Coulee and includes Paymaster Creek, South Fork Toats Coulee Creek headwaters. The south half of the south block drains into Sinlahekin Creek and includes Lone Frank Creek and the headwaters of Timothy Creek.

Figure 4. Watershed Analysis Units (WAUs)



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B. Forest Zones and Plant Communities

The following forest zones and plant communities are located within the NRCA: subalpine fir, Douglas fir, quaking aspen, wetland and riparian areas (herbaceous/shrub and montane coniferous), shrub-steppe, subalpine/alpine grassland and shrubland, and rock/talus. Harvested areas are also included (Figures 5 and 6, Vegetation). These zones and communities are defined primarily by elevation, aspect, and moisture conditions. The vegetation maps (Figures 5 and 6) of these zones and communities were developed using data from Forest Resource Inventory (FRIS) plots, aerial photograph interpretation, and spot field investigations. Descriptions are based on Franklin and Dyrness (1973), Lillybridge et al (1995), and field investigations made by DNR staff. Only some portions of the vegetation map have been ground-truthed, therefore it is inevitable that the map contains errors. Future ground-truthing will attempt to refine the vegetation map. Common names are used throughout this plan and scientific names are provided in Appendix D.

Subalpine Fir Zone

Vegetation throughout the NRCA consists primarily of subalpine forest types, with lodgepole pine the dominant tree in most areas. In general, the subalpine fir zone forests in the Loomis NRCA are typical of late-seral forests maintained by fire in the Okanogan region. Seral forests contain species (lodgepole pine in this case) that generally do not reproduce in their own shade or without some form of disturbance. High elevation lodgepole pine stands are dependant on fire for regeneration. When fire is suppressed, lodgepole pine trees age and die allowing climax species such as Engelmann spruce and sub-alpine fir to gradually colonize under the shade of the undisturbed seral species and eventually become the prominent species with a different forest structure. Other tree species often found in this zone include Douglas-fir, western larch, and whitebark pine. Lodgepole pine trees 80-120 years old become host to the mountain pine beetle, a native insect (Russell 1994). Mature stands of Engelmann spruce are susceptible to spruce beetles, also a native insect.

The understory in subalpine fir-zone forests varies considerably, mostly depending on the amount of moisture present. Common shrubs include grouse huckleberry, low huckleberry, Labrador tea, pachistima, shiny-leaf spirea, and Cascade azalea. Typical grasses and forbs are pinegrass, twinflower, heartleaf arnica, lupine, horsetails, starry false Solomon seal, and dogwood bunchberry (see Appendix D for scientific names).

Whitebark pine stands are occasionally found at the highest elevations within the subalpine fir zone and are susceptible to white pine blister rust, a non-native plant pathogen. A number of wildlife species eat the seed of whitebark pine including, Clark's nutcracker, red squirrel, black and grizzly bear, chipmunk, raven, Stellar's jay, and pine grosbeak. Of these species, the red squirrel and Clark's nutcracker harvest about 99% of the seeds in the Rocky Mountains. It is difficult to quantify the effect of bears on pine seeds because they obtain their seeds from red squirrel middens. It also appears that red squirrels and Clark's nutcrackers play a critical role in dispersing the seeds of whitebark pine (Hutchins 1994).

Figure 5. Vegetation - North Block

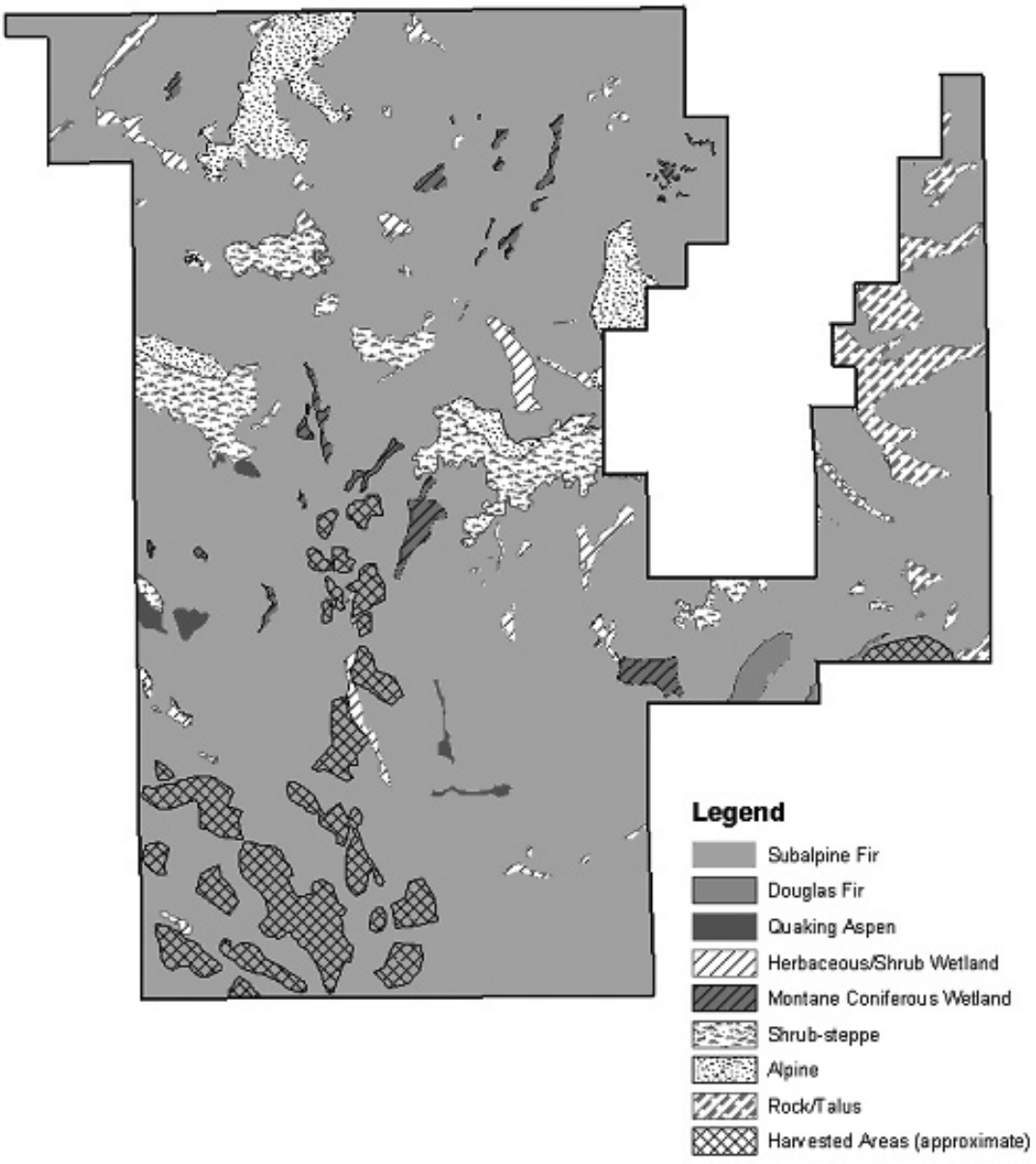

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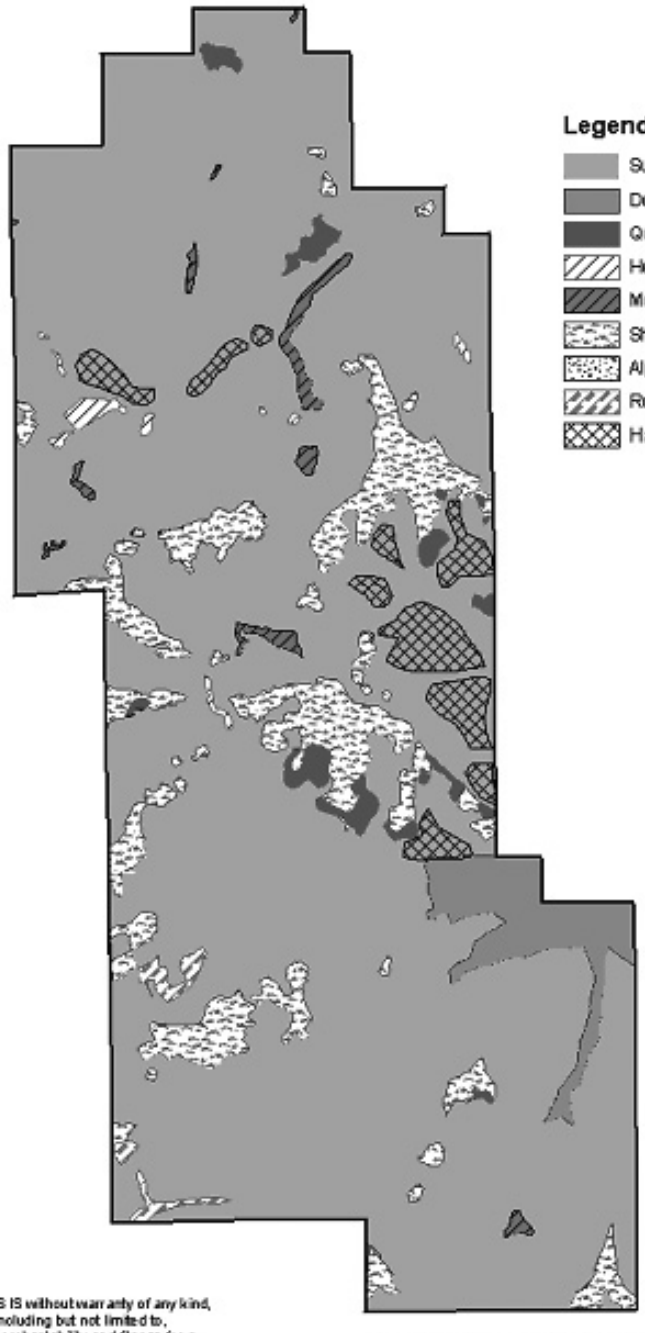
Figure 6. Vegetation - South Block



Legend

- Subalpine Fir
- Douglas Fir
- Quaking Aspen
- Herbaceous/Shrub Wetland
- Montane Coniferous Wetland
- Shrub-steppe
- Alpine
- Rock/Talus
- Harvested Areas

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Discussion

Overall, the large extent of the subalpine fir-zone forests and the scarcity of roads within both parcels create a significant area of contiguous, relatively undisturbed habitat for rare or legally protected species including Canada lynx and grizzly bear. The condition of the plant communities with regard to stand maturity and composition of understory vegetation varies considerably over the landscape. Older forests may be Important to ecosystem function and may provide denning habitat. If older forests become a rare feature on the landscape, then it may be important to protect it within the NRCA. The situation will be assessed by scientists and managers, and a solution for protection developed.

Insects

Mountain pine beetles (*Dendroctonus ponderosae*) are native insects that feed on the inner bark of lodgepole pine trees (other host trees include ponderosa and white pines, Douglas-fir, true firs, spruce and larch). It is normal within the natural system for 80-120 year old lodgepole pine stands to die from mountain pine beetle activity. Usually a variety of stand ages create a diverse forest where only a fraction of the trees serve as hosts for the beetles thus limiting the extent of dying trees.

Past stand replacement fires in and around the Loomis NRCA occurred close enough together to create large areas of relatively even-aged lodgepole pine forest. As the trees reached 80–120 years in age in the late 1980s and early 1990s beetle populations reached epidemic levels. The beetles have significantly depleted host trees and as a consequence, beetle populations are decreasing. The natural progression of the system is for fire to burn the fuels created by the beetles. In the absence of fire, sub-alpine fir will become the dominant species. Additional information is provided in the Forest Insect and Disease Leaflet #2 published by the US Forest Service.

The spruce beetle (*Dendroctonus rulfipennis*) is the most significant natural mortality agent of mature spruce. Spruce stands are most susceptible if they grow on well-drained sites in creek bottoms, have an average diameter at breast height (dbh) of 16 inches or more, a basal area greater than 150 square feet per acre, and more than 65 percent spruce in the canopy (Johnson 2000).

Endemic (normal population level) spruce beetle populations usually live in wind-thrown trees and when beetle populations increase in downed trees, beetles may enter susceptible, large-diameter standing trees. Most outbreaks in standing trees originate in wind-thrown trees (USDA, Forest Insect and Disease Leaflet 127).

In summary, the bark beetles are part of the natural system and in general are not a threat to the natural resources in the Loomis NRCA.

Disease

Whitebark pine stands found in the subalpine fir zone may be reduced or extirpated by white pine blister rust (*Cronartium ribicola*), an introduced fungus that infects whitebark pine trees. White pine blister rust has caused high levels of mortality in this species in other portions of the Cascades, the northern Rocky Mountains, and in Canada. White pine blister rust infects trees via the needles and then spreads to other portions of the tree through the cambium. It will kill branches or entire trees, readily infects saplings and seedlings, and makes infected trees more vulnerable to other diseases and insects.

Signs of this pathogen have not been observed in the Loomis NRCA, however it is known to occur with high incidence within North Cascades National Park and directly to the north in Canada. Potential measures to prevent infestation or reduce the spread of this organism include: removal of competing tree species, particularly subalpine fir, through fire or mechanical thinning; and planting high-mortality areas with blister rust-resistant whitebark pine trees propagated from on-site or local seed sources.

Fire

Lodgepole pine trees make up the majority of fuels within the NRCA and they typically burn infrequently with high intensity. The mean wildfire interval in lodgepole pine forests in this region is estimated to be approximately 112 years (Barrett et al. 1997), but intervals probably vary from 70-300 years. Wildfires are either stand replacement events or partial mortality events that thin the canopy considerably. Wildfire intervals of less than 200 years will generally maintain lodgepole pine as the dominant tree species. In the absence of wildfire, some high elevation stands of lodgepole pine have progressed beyond their primary pine component into a spruce-fir type. As explained above, as the trees become older, they become more susceptible to bark beetles, trees eventually die and fuel loads increase.

DNR is directed by the fire suppression RCW (76.04.750) which states that DNR should make every reasonable effort to suppress all wildfires. The following three primary alternatives have been considered to make up for the absence of wildfire, however other alternatives may be developed in the future.

1. Prescribed fire, where fire is set on purpose under conditions that offer the most potential for maintaining control of the fire is a common management tool. However, it is not recommended as a tool for maintaining the ecological processes of the lodgepole forests in the Loomis NRCA because the nature of the subalpine fir ecosystem is set up for large high intensity wildfires that are difficult to control. In order to mimic the natural role of wildfire, the prescribed burn would need to be large (+/- 5,000 acres) and is beyond what is considered a “controlled burn”. Typically, prescribed fires are small, less than 300 acres, and would not simulate a natural burn.

2. Prescribed fire is also used for managing fuel loads in specific vegetation types. Under the "right" conditions, controlled, low-intensity fires may consume fuels. However subalpine fir zone (lodgepole) forests generally do not burn at a low-intensity. The natural fire regime includes high-intensity, catastrophic fires.

3. A third option is to allow a wildfire to burn under very specific conditions dependant on weather, location and available resources (firefighters and equipment). In order for this to happen, state fire suppression laws would need to be changed. Also, considerable thought and research is needed to explore the possibilities of this option. Mechanically creating fuel breaks around the edges of the NRCA or in other strategic locations should be assessed and analyzed.

In summary, prescribed fire is not a suitable management tool at this time for the sub-alpine fir zone. Fire suppression is covered in the Guidelines section and in Appendix E, the Loomis NRCA Fire Suppression Plan. It is also important to note that reducing fuel loads Is not likely to decrease the fire intensity in the subalpine zone. Fuel reduction does little to mitigate fire effects in forests that have a low-frequency, high intensity fire regime because most fires occur during extreme weather conditions, become independent crown fires and cause significant mortality regardless of fuel loadings (Bessie and Johnson 1995).

Management Actions:

- Inventory and monitor the site for whitebark pine and monitor for occurrence of white pine blister rust.
- Coordinate with North Cascades National Park (and USFS) on monitoring the spread and potential management of white pine blister rust.
- Research options and opportunities to maintain the role of fire in the ecosystem.

Douglas-fir Zone

Less than 5% of the vegetation within the Loomis NRCA falls within the Douglas-fir zone. Natural characteristics of this zone include a semi-open, but relatively continuous, tree canopy dominated by Douglas-fir, western larch, ponderosa pine, and/or lodgepole pine. The understory is dominated by shrubs and/or grasses, and may be limited by dense tree growth. Common understory species in this zone include kinnikinnick, snowbrush, pachistima, shiny-leaf spirea, ninebark, common snowberry, and mountain snowberry. Pinegrass is a dominant grass throughout much of this zone.

The open structure of the Douglas-fir zone was maintained historically by a mixture of frequent, low-severity fire and less frequent, moderate to high severity fire (primarily low-severity fire regimes). Typical pre-settlement fire return intervals were approximately 10-30 years on average with occasional longer intervals (Agee 1993). Fire suppression, combined with some management practices, has resulted in dense

young canopy layers and ladder fuels, which in turn have increased the probability of stand-replacement high-severity fires and insect/disease outbreaks.

Douglas-fir beetles (*Dendroctonus pseudotsugae*), a native insect, are similar to the mountain pine beetle in that they seek out old, drought stressed or crowded host trees. Beetle larvae feed on the inner bark and are generally secondary pests, killing trees which have been previously weakened by other agents (Russell 1994).

Discussion

The importance and condition of Douglas-fir zone forest within the Loomis NRCA are similar to those described above for the subalpine fir-zone forest. The small amount of Douglas-fir zone forest in the Loomis NRCA is contiguous (at lower elevations) with the extensive subalpine fir-zone forests on the site.

Fire

Pockets of Douglas-fir stands are near border areas of the NRCA. These areas would be most suitable for fire breaks to reduce the threat of fire burning onto adjacent lands. Creating fire breaks in these areas would decrease fuel loads and move the system towards a more natural low-severity fire regime and act as a low fuel load zone. Furthermore, the creation of fuel breaks will also move the Douglas-fir forests towards a structure more typical of pre-settlement conditions. The effectiveness of creating fuel breaks in the Douglas fir zone should be assessed. As shown in figures 5 and 6, a very small portion of the NRCA is actually within the Douglas fir zone.

Management Actions

- Assess the feasibility and effectiveness of creating fuel breaks in the Douglas fir zone.

Quaking Aspen Forest

Within the Loomis NRCA, quaking aspen stands primarily occur in upland habitats as small patches (<5 acres) on south or southeast aspects. Stands are usually adjacent to shrub steppe and/or subalpine fir-zone forest. Aspen stands also are found in the vicinity of some streams and wetlands on the site. In these habitats, quaking aspen is generally the only tree present, with conifers occasionally scattered about. Understories vary from shrub- to grass- and forb-dominated vegetation. Common understory species include common snowberry and pinegrass.

Aspen stands in this area may be stable but are more likely seral to conifers (without some type of disturbance, conifers will eventually overtop them). Some stands can remain stable for decades but will eventually deteriorate as older trees die out.

Deteriorated stands are typically overtaken by conifers, but on some sites, especially dry sites, shrubs, grasses, and/or forbs may become dominant. Periodic fire removes conifers and rejuvenates aspen stands.

Quaking aspen is an important habitat for a variety of wildlife. Large ungulates including moose, elk, and deer use aspen stands for foraging and cover. These species all browse on aspen, particularly small suckers that originate following disturbance, as well as many of the understory plants typically found in aspen stands. A variety of birds use aspen habitats for foraging, nesting, and cover, including cavity nesters such as owls, woodpeckers, and sapsuckers, songbirds such as chickadees, warblers, tanagers, and bluebirds, and game species including several species of grouse. Beaver are highly selective of aspen trees for both food and dam construction. The seral stage of aspen habitats heavily influences the degree of use by different wildlife species. For instance, stands of small suckers provide large amounts of forage for ungulates while older stands provide better cover.

Discussion

The condition of aspen stands with regard to stand maturity and composition of understory vegetation has not been assessed. Many stands are near seeps or other areas with high water tables that have moist soils and relatively lush vegetation late into the season. As a result, cattle grazing is concentrated in some aspen stands and likely suppresses aspen rejuvenation. Furthermore fire suppression activities also interfere with the natural rejuvenation process. Reintroduction of fire, or perhaps mechanical disturbance, may be necessary to maintain the extent of aspen stands and the mix of seral stages that are important for wildlife.

Larvae of the satin moth (Leucoma salicis), an insect introduced into North America from Europe, attack various tree species in the genus Populus, including quaking aspen and black cottonwood. The caterpillars feed on the foliage of these species and can completely defoliate trees. Extensive and repeated defoliation can result in suppressed growth, top-kill, or tree mortality. Large infestations can kill significant portions of aspen or cottonwood stands.

Signs of this insect have not been observed in the Loomis NRCA, however it is known to occur in much of southern British Columbia as well as in portions of Washington State, including Okanogan County. Significant infestations have occurred in this area in recent years, resulting in mortality of entire aspen clones in some cases. Alternatives for control of satin moth currently include application of insecticide to the canopies of infected stands or introduction of biological control agents (parasitic wasps and flies).

Management Actions

- Inventory and map aspen stands and seral conditions.
- Maintain aspen component at its current approximate acreage or greater with a mix of seral conditions at landscape scale.

- Consider the use of prescribed fire or mechanical disturbance within aspen stands if necessary to maintain mixed seral conditions.
- If evidence of insect or disease activity such as satin moth is observed, consult with DNR Forest Health staff to determine the degree of threat posed and appropriate actions.
- Work with Coordinated Resource Management group to implement range management practices to deter livestock from grazing in aspen stands.

Riparian Areas and Wetlands

Riparian vegetation and wetlands occur throughout the NRCA and are often interconnected and similar in their plant composition. Riparian zones are found adjacent to watercourses such as streams, rivers, springs, ponds, and lakes and represent the interface between terrestrial and aquatic environments. On the NRCA, riparian vegetation exists along stream channels of all types within the area, while wetlands are found primarily along streams of low gradient and/or with wide floodplains, at the head of stream courses, and in depressions on hillsides where moisture accumulates and creates wet or boggy conditions. The width of riparian zones and the types of vegetation found within them depend strongly on elevation, the size and gradient of the stream, and the type of soil present. The size and composition of wetlands are similarly dependent on elevation, soils, and the hydrology of the associated stream system. Many of the wetlands dry out during late summer and early fall, however some of the habitats remain wet or moist throughout the year.

The majority of riparian habitats within the NRCA are shrub-dominated, with various willows being the most common type of shrub, particularly at higher elevations. At lower elevations, some riparian communities along larger streams have a quaking aspen overstory, and black cottonwood may be present along a few of the lowest-elevation riparian areas. Other common riparian plants in the NRCA include Labrador tea, Cascade azalea, bog birch, sedges, rushes, grasses, and various forbs. In general, riparian zones along smaller, intermittent or seasonal streams are narrow and the vegetation is relatively similar to the associated upland communities. Larger and/or perennial streams generally have a wider riparian zone with a more distinctive strip of riparian vegetation. In these habitats, the vegetation may include riparian tree species such as quaking aspen, black cottonwood, or Engelmann spruce, as well as a mixture of riparian shrubs and herbs.

Wetlands in the Loomis NRCA have been grouped into the following two types based primarily on amount of coniferous tree cover:

- *Herbaceous/Shrub Wetland*: Open wet areas with less than approximately 30% tree cover. Includes marshes, herbaceous wet meadows, and shrub-scrub. Plant species typically include willows, bog birch, Labrador tea, Cascade azalea, sedges,

- rushes, grasses, and various forbs. Some communities have substantial amounts of *Sphagnum* moss.

- *Montane Coniferous Wetland*: Wet areas with approximately 30% or greater cover of coniferous trees. May include small areas of Herbaceous/Shrub Wetland. Plant species composition is similar to Herbaceous/Shrub Wetland except for the greater amount of tree cover.

Naturalists have long recognized the importance of riparian habitats to wildlife for several reasons: (1) the presence of surface water provides a critical habitat component for wildlife and the abundance of soil moisture creates habitat conditions favorable to many wildlife species; (2) the increased humidity, higher rates of transpiration, and greater air movement found in riparian zones create microclimate conditions that differ from adjacent uplands and are preferred by wildlife during hot weather; (3) the plant communities in riparian zones are more complex in their structure and composition and more productive than uplands (Bull 1978); (4) the linear shape of riparian zones make them natural corridors for many wildlife species (Thomas et al. 1979, Brinson et al. 1981, Oakley et al. 1985) and therefore might represent routes of gene flow (West 1988). Because of the unique aspects of riparian zones, some species are specifically associated with riparian zones (Pearson and Manuwal 2001).

Discussion

The condition of wetlands and riparian habitats in the Loomis NRCA with regard to species composition and hydrologic characteristics has not been assessed. Wetland/riparian systems typically have relatively fresh, palatable vegetation late in the growing season and frequently are associated with sources of drinking water for livestock. As a result, grazing is often somewhat concentrated in these areas, particularly late in the season. The concentration of grazing activity and development of trails can lead to impacts to vegetation, soils, and/or hydrology. A variety of impacts may be associated with heavy use of wetlands or riparian zones, such as soil compaction, hoof shear damage, downcutting of stream channels, alteration of flood regimes, and suppression of important wetland/riparian vegetation, particularly shrubs and sedges. Wetlands and riparian areas are included in the HB1309 Ecosystem Standards (B12, B13, B14a, B14b, B15, and B16) and management issues concerning cattle will be addressed specifically in the Resource Management Plans for each permit range.

Maintenance of wetland and riparian habitats is primarily dependent on maintaining the appropriate hydrologic conditions. In the past, occasional fires may have played a role in removing shrub and tree cover; however because of the wet conditions most wetland/riparian habitats probably burned very infrequently.

Management Actions

- Work with permit holders to achieve the Ecosystem Standards for State-owned Agricultural and Grazing Land.
- Maintain a mix of seral conditions on wetlands throughout the NRCA, where they are dominated by native, non-increaser species and have a mix of shrub size classes where appropriate.
- Inventory and map riparian habitats
- Assess trails where they interface with wetlands and riparian zones.
- Relocate or recondition trails to address impacts to natural hydrologic and geomorphic processes.

Shrub-Steppe

High-elevation shrub-steppe (including dry meadows) is found in 200-300 acre patches at 5,000-7,000 feet elevation, generally on dry, south-facing slopes. It consists of non-forested areas dominated by bunch and sod forming grasses, and shrubs, and is mainly devoid of trees. Shrubs, primarily mountain big sagebrush, may be absent, widely scattered, or form a dense stand. Perennial grasses and forbs generally make up the majority of vegetative cover. Some of the areas classified as shrub-steppe do not currently have shrub cover and are actually dry grassy meadows. Occasional trees may be widely scattered.

Plant species typically found in these shrub-steppe communities include mountain big sagebrush, western wheatgrass, Idaho fescue, pinegrass, California brome, various upland sedges, Wheeler's bluegrass, purple oniongrass , and a variety of forbs such as yarrow, pussytoes, prairie smoke, desert-parsley, lupines, and groundsel (refer to Appendix D for scientific names).

Discussion

The condition of shrub-steppe on the NRCA with regard to composition and non-native species has not been assessed. Cattle grazing is often concentrated in these areas due to the availability of desirable forage (grasses, sedges), especially in the early and mid season. Horse/cattle trails also access some of the shrub-steppe habitats on the NRCA, notably Goodenough Park and Disappointment Ridge.

These shrub-steppe habitats occur on warm, dry exposures of the south-facing slopes with poorly developed soils. Fire played a significant role in the past in removing occasional "invader" trees, and more importantly in creating a mosaic of seral conditions (areas with low and high shrub cover). The historic fire regime probably consisted of moderate-frequency (every 20-50 years) low-intensity fires, which would kill most small trees and mountain big sagebrush, leaving a more open grassland until sagebrush and other shrubs re-established. Shrub-steppe

communities are probably the most vulnerable on the NRCA to weed invasion. Soil disturbance, including fire, or overgrazing of native vegetation often result in invasion and increase of weedy species.

Due to the low-intensity fire regime in the shrub-steppe zone, prescribed fire may be an option for maintaining ecological processes in that zone. However, fire would need to be carefully implemented in order to minimize any increase in weedy species, particularly non-native annual grasses such as cheatgrass.

Management Actions

- Inventory and map conditions of shrub-steppe, including shrub cover/seral status.
- Maintain a mix of seral conditions in shrub-steppe communities throughout the NRCA.
- Work with permit holders to achieve Ecosystem Standards.

Subalpine/Alpine Grassland and Shrubland:

In the NRCA, alpine vegetation only occurs above approximately 7,000 feet elevation on Snowshoe Mountain. It also occurs in the Chopaka NAP on Joe Mills Mountain, Hurley Peak, and Chopaka Mountain. Alpine communities primarily include grass-, forb-, and sedge-dominated meadows and fellfields, as well as some low shrub-dominated habitats. Some fellfield communities are primarily rock or bare ground with very sparse vegetation. This zone also includes subalpine parkland communities, which consist of subalpine meadows in a mosaic with scattered trees or tree clumps. These parklands typically have tree cover of less than 30%.

Alpine communities are primarily defined by a short growing season and deep winter snowpacks, which are often combined with summer drought to create extremely harsh growing conditions. Although not well understood, fire may have played a role in the past in maintaining some alpine meadows by removing trees.

Discussion

The condition of alpine vegetation on the NRCA with regard to composition and non-native species has not been assessed. A large area of high-quality alpine vegetation occurs in the adjacent Chopaka NAP. Cattle may use some areas of alpine habitat for grazing, however most of the habitat on Snowshoe Mountain is very difficult to access and not likely to be affected by livestock. Similarly, trail use by horses is likely to be minor. The amount of hiker use on Snowshoe Mountain is unknown.

Whitebark pine stands in sublapine/alpine habitats may be reduced or extirpated by white pine blister rust, an introduced fungus that infects whitebark pine trees (see Subalpine Fir Zone section).

Management Actions

- Maintain alpine communities dominated by native, non-increaser species, with few or no introduced species.
- Maintain a mosaic of shrub/forb-dominated communities and parkland communities.
- Survey/Inventory vegetation in alpine areas.
- Avoid trail development in alpine areas.
- Refer to Sub-alpine fir zone Management Actions for reference to Whitebark pine blister rust.
- Work with permit holders to achieve Ecosystem Standards.

Rock/Talus

Rock/talus includes any areas of significant bare rock, cliffs, boulder fields, or talus. These occur at all elevations within the NRCA but are most common at higher elevations. The habitats are generally devoid of vegetation, although lichen and moss cover may be high.

Discussion

Although a minor habitat in terms of area, these communities are important for a number of wildlife species and for several rare plant taxa that may occur in the area.

Management Action

- Map talus areas and survey them for rare plant and wildlife species.

Harvested Areas

Several areas in the northern block and to a lesser extent in the southern block, have areas that were harvested between1988 and 2000. All of the harvested areas are located in subalpine fir zone forest and have been allowed to regenerate naturally. Regeneration of tree species varies among the harvested units, with some having dense reproduction of lodgepole pine and others having a mix of species including lodgepole pine, subalpine fir, and Engelmann spruce.

Discussion

These areas might be good as a control site for experimental projects to compare different silvicultural prescriptions and their long-term effect on forest structure. These areas and the roads built to access them are also vulnerable to weeds. In keeping with the management goals of the site, the harvested areas will be allowed to recover naturally. Interference may occur if habitat requirements need to be met on a shorter time-line.

Management Actions

- Monitor weed populations and if necessary develop and implement a weed control plan.
- Provide opportunities for research.

C. Plant Species

A thorough rare plant inventory has not been done for the Loomis NRCA. However, some species have been identified and recorded in the Washington Natural Heritage Database. As a result, several species are noted in this plan and more may be identified during future inventory efforts. Other plant species of concern include noxious weeds and non-native invasive plants.

Rare Plants

For the purposes of this document, rare plants are plants assigned

- a federal status category of endangered, threatened or candidate;

- a Washington Natural Heritage Program status category of endangered, threatened, sensitive, or possibly extinct or extirpated in Washington; and/or

- a global or state rank of 1, 2 or 3.

All of these categories and rankings are defined in Appendix C.

Of the plant species known to occur in the Loomis NRCA, none of them have federal status. Table 1 lists rare plant species known to occur within the NRCA and their associated state status and global and state rankings. A thorough rare plant inventory is needed to provide a comprehensive list of rare plants in the NRCA.

Plants are prioritized in Table 1 beginning with state endangered, threatened and sensitive plants. Plants possibly extinct or extirpated in Washington are medium priority, and review groups and watch species are the lowest priority. The state plant species list is currently being updated and plants marked with an * reflect the most

current information that will be included in the anticipated revision of the Endangered, Threatened and Sensitive Vascular Plants of Washington with Working Lists of Rare Non-Vascular Species publication.

Table #1. Rare Plant Species List

Federal and State Status	Species	Rank	Habitat
State Threatened	Two-spiked moonwort *Botrychium paradoxum* *	G2S2	Herbaceous/shrub wetland, subalpine/alpine
State Sensitive	Diverse-leaved cinquefoil Potentilla diversifolia var. perdissecta	G3G4S3	Subalpine/alpine, shrub-steppe, rock/talus
	Tweedy's willow *Salix tweedyi*	G3G4S3	Herbaceous/shrub wetland
	Scandanavian sedge Carex norvegica	G5S2	Herbaceous/shrub wetland, subalpine/alpine
Review Group 2	Blackened sedge *Carex atrosquama* *	G4?S1	Herbaceous/shrub wetland, shrub-steppe, subalpine/alpine
	Gray's bluegrass *Poa arctica ssp. arctica*	G5?S1S2	Subalpine/alpine, rock/talus
	Different-nerved sedge *Carex heteroneura* *	G5S2	Herbaceous/shrub wetland, shrub-steppe, subalpine/alpine
State Watch	Jictorin's grape-fern *Botrychium minganense* *	G4S3	Conifer forest, herbaceous/shrub wetland, subalpine/alpine, quaking aspen
	St. John's moonwort *Botrychium pinnatum*	G4?S3	Herbaceous/shrub wetland
	Lance-leaved grape-fern *Botrychium lanceolatum*	G5S3	Herbaceous/shrub wetland, shrub-steppe, quaking aspen
	Moonwort *Botrychium lunaria* *	G5S3	Herbaceous/shrub wetland, shrub-steppe, quaking aspen
	Little grape-fern *Botrychium simplex* *	G5S3	Herbaceous/shrub wetland, subalpine/alpine

G = global status, T = subspecies status, S = state status.
1 = Critically imperiled, 2 = Vulnerable, 3 = Very rare, 4 = Apparently secure, 5 = Widespread, abundant and secure
G#G# or S#S# = uncertainty between ranks.

See Appendix C for complete description of ranks.

Discussion

Eleven of the twelve plant species listed in Table 1 are predominately found in open, non-forest habitats including wetlands, shrub-steppe, grassland, subalpine/alpine meadows, and rocky areas. This includes most of the areas designated as "Sensitive" within the NRCA. Trails access some of these areas, although current recreational use levels do not appear to threaten the plant populations. The primary potential impact is livestock grazing, which is often concentrated in these habitats due to forage and water availability. Heavy livestock use may be detrimental to rare plant populations due to trampling, introduction and spread of weeds, and/or direct grazing.

Adherence to Ecosystem Standards for grazing in these habitats will help to minimize these threats and reduce impacts to rare plants.

The Washington Natural Heritage Program tracks and monitors all plants with a state status of endangered, threatened or sensitive. Endangered and threatened plants usually require a designed monitoring scheme while plants categorized as sensitive may be visually monitored. If the status of a species changes or an extremely rare species is discovered, it may be necessary to modify management prescriptions in order to conserve the species in the long-term.

Management Actions

- Maintain Ecosystem Standards to help ensure that viable populations of rare plant taxa continue to exist, subject to natural variations.
- Survey the project site for rare plants prior to ground disturbing projects.
- Systematically inventory the NRCA for other potential occurrences of endangered, threatened or sensitive plants.
- Work with Natural Heritage botanists to determine appropriate monitoring scheme for two-spiked moonwort.
- Revisit known occurrences of state sensitive plants at least every three years at the appropriate time of year and update their status.

Noxious Weeds

A formal inventory of noxious weeds has not been conducted in the Loomis NRCA. In general, observations indicate that there are currently few, if any, significant populations of weeds on the site. Weed management guidelines are covered in the Management Guideline Chapter of this plan.

Management Actions

- Conduct periodic inspections of disturbed areas (e.g. harvested and burned areas, roads and trails) with high potential for weed invasion,
- Map and document occurrences of noxious weeds.

- Develop and implement weed control plans that use an integrated pest management approach and focus on minimizing impacts of the control methods while effectively controlling target weeds.

D. Wildlife Habitat

Wildlife habitat was prioritized based on federal and state designations and the Natural Heritage Network global and state ranking system. Table 2 includes species listed as threatened or endangered by either federal or state fish and wildlife agencies and species with a global or state rank 1, 2 or 3 (definitions of status categories and rankings are provided in Appendix C).

One of the goals for the site is to protect habitat for threatened, endangered and sensitive wildlife. Thus this section describes the types of habitat that are important to the wildlife species in Table 2. Washington Department of Fish and Wildlife manages wildlife species and DNR manages the habitat. DNR will cooperate with Washington Department of Fish and Wildlife on species management. Management activities will comply with Endangered Species Act obligations for all federal listed wildlife species.

Many of these species are wide-ranging and sensitive to human activity and the Loomis NRCA contributes to the overall extent of their home ranges. It is important to note that rankings and listings change, and there may be a lag time between when the status of a species has changed and when the change is reflected in the listing or ranking. For example, current studies indicate a resident population of gray wolf in Washington state (pers. comm. Fleckenstein). However, the state rank has not yet been changed from SA to S1 to reflect this new information. Some species have two G ranks or two S ranks and this indicates uncertainty between two ranks.

Table 2. Priority Wildlife Species

Species	Rank	State Status	Federal Status
Grizzly bear (*Ursus arctos horribilis*)	G4T3T4S1	Endangered	Threatened
Gray wolf (*Canis lupus*)	G4SA	Endangered	Endangered
Wolverine (*Gulo gulo luscus*)	G4T4S1S2	Candidate	Concern
Canada lynx (*Lynx canadensis*)	G5S1S2	Threatened	Threatened
Northern goshawk (*Accipiter gentilis*)	G5S3B,S3N	Candidate	Concern
Astarte fritillary (*Boloria astarte*)	G5T3S2	n/a	n/a
Alpine checkered skipper (*Pyrgus centaureae loki*)	G5T4S2	n/a	n/a
Lustrous copper (*Lycaena cuprea*)	G5S2	n/a	n/a
Manitoba skipper (*Hesperia comma Manitoba*)	G5T5S2S3	n/a	n/a

G = global status, T = subspecies status, S = state status.
1 = Critically imperiled, 2 = Vulnerable, 3 = Very rare, 4 = Apparently secure, 5 = Widespread, abundant and secure
A = Accidental,; infrequent, H = Historical record, U = Uncertain; additional information needed, ? = uncertainty about assigned rank. B = Breeding habitat, N = Nesting habitat, Q = Questionable taxonomy, G#G# or S#S# = uncertainty between ranks.

See Appendix C for complete description of ranks.

Late Successional Forest

Late successional forests are typically structurally and biologically diverse. The complexity of the ecosystem ultimately sustains biodiversity, providing habitat for multitudes of species.

Late successional forests provide a variety of environmental, structural and spatial attributes. These forests usually have at least 4 vegetative layers (mature canopy, sapling canopy, shrub and herbaceous), patchy canopies (variety of tree sizes and spacing), large standing dead trees and coarse woody debris. The distribution of late successional forest across the landscape provides corridors for wildlife dispersal and movement between the Loomis State Forest, the Loomis NRCA and adjacent reserves on federal lands. It also provides habitat for wildlife with large home-ranges, wildlife dependant upon specific structural habitat found within late successional forests and rare, threatened or endangered species.

Discussion

Late successional forest areas identified within the NRCA contribute to a larger network of habitat throughout the Loomis Forest and adjacent land, and will be considered in meeting the goals and objectives of the Loomis Forest Landscape Plan. Over time, the forest mosaic will shift and late successional forests will gradually disappear and reappear across the landscape as environmental, structural and spatial attributes change. Fire and beetles may change late successional forests more rapidly.

Management Actions

- Allow late successional forest characteristics to develop through natural processes and natural ranges of variability.

Grizzly Bear (Ursus arctos horribilis)

The grizzly bear is the larger of the two bear species found in Washington. A grizzly bear can be distinguished from a black bear by its concave face profile, a hump on its shoulders and tracks. While study of this very rugged and remote habitat indicates that this ecosystem is capable of supporting a self-sustaining population of grizzlies, only a "remnant" population remains, incapable of enduring without active recovery efforts, including possible augmentation with bears from other areas (US Fish and Wildlife Service 2000). No resident grizzly bears are known to exist within the Loomis NRCA (Washington Fish and Wildlife Priority Habitat and Species database).

Grizzly bear are listed by the federal government as threatened in Washington (USFWS 1993) and by the state as endangered (WDFW 2002). The US Fish and Wildlife Service delineated six Recovery Ecosystems and the North Cascades Grizzly Bear Ecosystem is the second largest (USFWS 1993). A supplemental chapter was developed to specifically address grizzly bear recovery in the North Cascades and was added to the Grizzly Bear Recovery Plan in 1997. Within the North Cascades

ecosystem, Washington's portion is subdivided into 54 Bear Management Units (BMUs) including the Upper Toats BMU which encompasses the Loomis NRCA.

All naturally vegetated land types are considered suitable grizzly bear habitat as the species ranges over large areas and typically uses many vegetation types to fulfill its life requirements. Habitats of special importance to this wide-ranging species include: wet meadows, swamps, bogs, streams, alpine meadows and parklands, and conifer, sub-alpine, and lodgepole pine forests (Brown 1985). More specifically, they prefer areas with little human disturbance. Grizzly bear "core" habitat is that which is greater than a third of a mile from roads and high use trails (average of 20 or more parties per week).

Discussion

Grizzly bears are sensitive to human activity. The Grizzly Bear Recovery Plan identifies human access management (USFWS 1993) as the single most important tool for managing and maintaining grizzly bear habitat. Direct habitat loss and bear mortality associated with roads and trails, together with indirect behavioral effects (*e.g.*, male - female interactions and avoidance behaviors) associated with roads and trails, may cumulatively impair recovery of small grizzly bear populations like those in the North Cascades.

Management Actions

- Distribute and post safety procedures for avoiding contact with grizzly bear.

Gray Wolf (Canis lupus)

The gray wolf is listed as federally endangered. Wolves are social animals, normally living in packs of 2 to 10 members. Packs are primarily family groups consisting of a breeding pair, their pups from the current year, offspring from the previous year, and occasionally an unrelated wolf. Packs occupy, and defend from other packs and individual wolves, a territory of 20 to 214 square miles (USFWS 2000). In the northern U.S. Rocky Mountains, territories tend to be larger, typically from 200 to 400 square miles (USFWS 2000). In 1990, adults with pups were seen in the Hozomeen area of Washington (North Cascades near Ross Lake at the Canada border). Since 1990, biologists have seen three separate groups of adult wolves with pups in the Cascades (North Cascades National Park 1998). Because of this apparent expansion in the range of wolves in Washington, they may eventually be found within the Loomis NRCA. The gray wolf uses many habitat types as long as there is an adequate ungulate prey base (Laufer and Jenkins 1989). Potential prey for wolves in the Loomis NRCA are: white-tailed deer, mule deer, moose, mountain goats, and bighorn sheep.

Discussion

In late spring, wolves use den sites for maintaining wolf pup temperatures (first 3 weeks), nursing, and protection from potential predators. During these critical

early weeks, the pups are especially vulnerable to den site disturbances that keep the female away (Joslin and Youmans 1999). Wolves will sometimes abandon a den if disturbed by humans (Mech et al. 1991). After denning, rendezvous sites (places where pups are left temporarily while the pack hunts) are often located near water and bordering meadows. Wolves may be sensitive to disturbance at rendezvous sites and may abandon the site in response to human activity (Joslin and Youmans 1999). Consequently, human activities near den and rendezvous sites should be avoided.

Management Actions

- Coordinate with Fish and Wildlife Service, and Washington Department of Fish and Wildlife to determine trail closure dates, locations and other potential management actions.

Wolverine (Gulo gulo luscus)

The wolverine is the largest member of the weasel family and is robust in appearance, rather like a small bear with a broad head, rounded ears, small eyes, short legs, with a dark brown coat with two buff stripes that sweep from the nape of the neck along the flanks and to the base of a long bushy tail. The wolverine is a wide-ranging species and has been characterized as one of North America's rarest mammals and the least known large carnivore. No wolverine sightings have occurred in the Loomis NRCA, however this species may exist in an area and never have been seen. A wolverine and its den were located during the winter of 2001/2002 in the Pasayten Wilderness not far from the Loomis NRCA.

Wolverines in Idaho (Magoun and Copeland 1998) and British Columbia select sub-alpine cirque basins above 8,202 feet elevation with large boulder talus (rocks > 2 meters diameter) for denning. They prefer areas with little or no human activity. Wolverines have a diverse diet that ranges from ground squirrels and marmots to ungulates. Most ungulate in the diet is from carrion, and ungulate carrion is the main food source available in the winter. Avalanche-killed mountain goats can be another source of carrion. Wolverines primarily use coniferous forest (70%), but also use higher elevation habitats with marmots, voles, *etc*., in summer.

Discussion

The most common habitat characteristic is isolation from humans. Wolverine use of an area may be virtually eliminated by human disturbance (*e.g.*, heavy snowmobile or recreational ski use). Direct contact between humans and two denning females in Idaho in late April and May resulted in den abandonment in both cases (Magoun and Copeland 1998). Consequently, providing areas free from disturbance for denning is invaluable to Washington's low-density population.

Management Action

- Coordinate with Fish and Wildlife Service, and Washington Department of Fish and Wildlife to determine trail closure dates, locations and other potential management actions.

Canada Lynx (Lynx canadensis)

Canada lynx stand 2-3 feet at the shoulder are about three feet long and are characterized by a short, black tipped tail, tufted ears, facial ruff, elongated hind legs, and large (3-4") paws. Their large, snowshoe-like paws enable them to inhabit snowy areas often avoided by other predators *(e.g.* coyotes and cougars). Both blocks of the Loomis NRCA have many recorded sightings for lynx.

Mean home ranges of lynx in Washington were from 14 (female) to 21 (male) square miles, but have been recorded as large as 38.2 square miles (Brittell et al. 1989, Koehler 1990). Lynx home ranges tend to overlap with mid-successional forests (Saunders 1961, Koehler et al. 1979, Kesterson 1988, Major 1989). Lynx inhabit 20-40 year old forests that regenerated after a low to moderate intensity burn (usually stand replacement fires). The habitat characteristics of these forests include high vertical and horizontal vegetative cover, a result of high stem densities, with average tree heights of 7-20 feet (2-6m) and 75-80% crown closure (Parker 1981, Thompson et al. 1989).

The association between lynx and mature and older forests is less clear than their association with mid-successional forests. Some mature forests contain a relatively dense layer of shrubs or regenerating trees and provide habitat for snowshoe hares, the primary food source for lynx. Mature forests also contain structural components currently thought necessary to be suitable denning habitat, including log piles (i.e., deadfall, windfall, etc.), rocks, root tangles, shrub thickets, or similarly dense vegetation. The spatial relationship between mature and mid-successional forests may also influence the use of mature forests by lynx. Wildland fires often leave unburned patches or stringers. In time, as these areas develop into mature forests, they are often used by lynx (Koehler et al. 1979, Kesterson 1988, Staples 1995), for foraging and denning sites.

Discussion

Wild fire historically played an important role in maintaining the mosaic of forest and successional stages that provide habitat for both snowshoe hare and lynx (Ruediger et al. 2000). There is a negative correlation between lynx use and the amount of area burned for the first years after a fire (Fox 1978). Hare populations increase with time after stand regneration and populations peak 15 to 30 years after stand re-initiation (depending on tree species, habitat type, and severity of fire). Lynx population numbers are closely tied to the abundance of hare, thus wildfire is beneficial to the lynx through the creation of prey habitat. Consequently, fire may be recommended as a management strategy, especially in regions where the forests are dominated by mature and older forests. Periodic

fires can create a mosaic of forest ages across the landscape and as a result, provide patches of appropriate lynx and hare habitat.

Management Actions

- Coordinate with US Fish and Wildlife Service and Washington Department of Fish and Wildlife to meet Canada lynx habitat protection goals and objectives outlined in the DNR Modified Lynx Habitat Plan.
- Adapt management actions as additional research is provided.

Northern Goshawk (Accipiter gentilis)

This species typically nests in mature to old-growth forests composed primarily of large trees with high canopy closure, near the bottom hill slopes, with sparse ground cover, and near water (Squires and Reynolds 1997). Goshawks nest from sea level to the alpine zone and rarely uses forest stands < 25 acres. They hunt in diverse habitats from open sage steppe to dense forests (Squires and Reynolds 1997) and will forage over long distances for relatively large-bodied birds and mammals (squirrels, jackrabbits, snowshoe hare, grouse, corvids, woodpeckers, etc.). In the winter, goshawks use cottonwood riparian areas (Squires and Ruggiero 1995), aspen, spruce/fir, lodgepole pine, ponderosa pine, and open habitats (Squires and Reynolds 1997).

Discussion

This species benefits from late seral forests near water for nesting but will forage in a variety of habitat types. They are considered a "management indicator" species on many national forests because they are potentially sensitive to habitat change.

Management Actions

- Consider potential impacts of management and recreational activities around known and potential nest sites.

Alpine Butterflies

Four alpine butterflies associated with alpine and subalpine plant communities that are rare in the state either occur or are likely to occur within the NRCA: alpine checkered skipper (*Pyrgus centaureae loki*), Manitoba skipper (*Hesperia comma Manitoba*), lustrous copper (*Lycaena cuprea*), and Astarte fritillary (*Boloria astarte astarte*). In Washington, these species are only found within the Okanogan Highlands. The primary distribution of these species outside of Washington includes British Columbia, Yukon Territory and Alberta.

Discussion

The butterflies depend on plant species that are part of the dry alpine mosaic and subalpine plant communities for reproduction and survival.

Management Action

- Management actions are the same as those outlined for the subalpine/alpine grassland and shrubland plant communities (see the Forest Zones and Plant Communities section).

Special Interest Species

Bird species with primarily boreal distributions that occur in the region surrounding the Loomis NRCA include: great gray owl, boreal owl, spruce grouse, white-tailed ptarmigan, boreal chickadee, three-toed woodpecker, black-backed woodpecker and northern bog lemming.

California bighorn sheep were re-introduced to the area in an effort to establish a native population. This species is managed by the Washington Department of Fish and Wildlife as a game species and is not considered rare in the state. However the Washington Department of Fish and Wildlife does have a specific interest in bighorn sheep populations in the Loomis forest area.

Discussion

Boreal species are much more abundant in Canada and inhabit Washington at the extreme southern extent of their range. Usually management activities are prioritized by meeting the needs of rare or listed species, however the overall land management goals of the NRCA are conducive to serving wildlife habitat needs in general.

Management Actions

- Maintain an awareness of indicator species and their natural range of variation.
- Support Department of Fish and Wildlife and the Canadian Wildlife Service efforts to monitor and maintain bighorn sheep populations.

Non-Native Animals

Disregarding livestock, turkeys are the only non-native species sighted in the Loomis NRCA. Impacts from the presence of turkeys have not been documented.

Management Actions

- Conduct periodic inspections of the site for non-native wildlife species.
- As non-native wildlife species are discovered, sightings and disturbance to the site should be documented, and work with the Department of Fish and Wildlife to develop a control plan.

E. Land Use

It is very likely that the Loomis NRCA was used by Native American Tribes now represented by Colville Confederated Tribes and the Upper Similkameen Indian Band (First Nations People of Canada), however specific documentation of traditional gathering or spiritual sites are not recorded. During the early days of settlement the land was used by sheep herders, cattlemen, hunters, trappers, and mineral prospectors. Through the years land use shifted. Livestock grazing and hunting continued while newer uses such as commercial logging, recreational hiking, equestrian use, snowmobiling, cross-country skiing and snowshoeing developed. Those uses, except for commercial logging, continue today and are included in the management of the NRCA.

Even though the NRCA is in public ownership, it is very important to many of the local residents and citizens throughout the state. Some people relate to the site through generations of memories and family history tied to using the natural resources of the area. Some people feel connected to the site through their strong belief in conservation. Many people claim both.

This section addresses a variety of public use perspectives and offers some direction on how various uses may be accommodated. Table 3 outlines allowed uses and conditions of use.

Table 3. Allowed uses within the Loomis NRCA.

Type of Use	Conditions of Use
Hiking, Nature Study, Photography	All use is subject to "pack-it-in, pack-it-out" guidelines.
Approved Research	Allowed provided that researchers receive approval from DNR prior to conducting their research project.
Cross-Country Skiing Snow-Shoeing	Allowed on all DNR approved trails.
Snowmobile Use	Allowed on DNR approved all season and winter use only trails and play areas as shown in figures 7 and 8.
Camping	Dispersed, "no trace".
Horseback Riding	Allowed on DNR approved all season and summer use only trails as shown in figures 7 and 8. Exception permitted for permit range management.
Fishing & Hunting	Allowed based on historic use and regulated by the Department of Fish and Wildlife.
Livestock Grazing	Allowed with a valid grazing permit.
Pets	Must be on a leash.
Wheeled Motorized Vehicles	Prohibited in all areas except for Thunder Mountain Road and Lone Frank Road. Additional exceptions allowed for management purposes (including permit range management) with use restricted to roads and trails. Exceptions will also be made for emergency vehicles.

Incompatible Uses

Some types of use are not compatible with the goals of the Loomis NRCA. When done frequently or by enough visitors, these activities prevent DNR from successfully fulfilling its land management responsibilities outlined in the NRCA Act and the Settlement Agreement. Incompatible uses include any activities that DNR determines to be unsafe, destructive, disruptive or in conflict with the management goals of this plan. They include, but are not limited to:

- Recreation with wheeled (motorized/non-motorized, e.g. mountain bikes) vehicles,
- Removal or alteration of vegetation, soil, or rock, except as part of weed control, habitat restoration projects, permitted livestock grazing or tribal use.

* Note: Wheelchairs are not included in the restrictions listed above.

Conditional Use

Any use not in Table 3 is disallowed, except by temporary permit granted by DNR for Conditional Uses when the proposed use is proven to meet all of the following criteria:

- poses no threat to protected sensitive resources,
- does not compromise or degrade ecosystems and resources on the NRCA,
- provides a net benefit to the NRCA program,
- does not deprive the general public access to enjoyment of the NRCA, and
- does not detract from the general public interest.

Public uses not addressed in this plan will be evaluated in the future based on the following criteria:

- Compatibility with NRCA Statewide Plan public use policies and the settlement agreement for the Loomis NRCA.
- Compatibility with ecological goals outlined in this plan.
- Availability of appropriate sites within the NRCA that are not sensitive to the proposed activity.

Access

North Block

Access to the north block of the NRCA is limited to foot, horseback, and non-wheeled motorized vehicles. Wheeled vehicle access is limited to site management (including permit range management) and emergency vehicles. Visitors can reach the boundary of the north block by traveling on DNR roads (Figure 7, Trails and Roads). The Ninemile Road ends at the Loomis NRCA boundary north of Cold Creek Campground where a gate marks the boundary and limits vehicle access to the Loomis NRCA. The gate is posted with a sign stating that wheeled motorized vehicles are not permitted beyond the gate, however, trespass does occur.

A gate on the Fourteenmile Road half a mile south of the Loomis conservation area boundary also limits wheeled vehicle access, however hikers, horses and snowmobiles are not restricted. An additional gate at the NRCA boundary allows equestrians and hikers to access the site and provides a place to move equipment and cattle around the cattle guard.

The north block can also be accessed by the Albert Camp Trail from Forest Service land. A small gate at the conservation area boundary on the Albert Camp Trial allows hikers and equestrians to pass through while keeping cattle in the permit range area. The area accessed by Albert Camp Trail west of the North Fork Toats Coulee Creek and south of Little Horseshoe Creek was not used in the past for snowmobile use thus snowmobiles are not permitted in this area.

Several other trails provide access to the conservation area for hikers and equestrians from the Pasayten Wilderness. Boundary markers are subtle or non-existent.

South Block

Thunder Mountain and Lone Frank roads both go through the conservation area and carry through traffic (Figure 8, Trails and Roads). Both roads are unsigned and rough. Low-clearance or 2-wheel drive vehicles are not suitable for traveling either road.

Thunder Mountain Road is accessed from the east by state forest roads in the Loomis State Forest and from the west by USFS forest roads in the Okanogan National Forest. Thunder Mountain Road is part of a popular scenic driving loop, however it is closed to wheeled motorized vehicles in the winter and spring months due to snow and wet conditions. The road also serves emergency vehicles.

Lone Frank Road (#3820) crosses the southwest corner of the south block. Users travel on this road with ATVs and snowmobiles to access the area around Tiffany Mountain.

Three trails provide access to the south block area from Forest Service and state land for snowmobiles, equestrians, and hikers. Boundary markers are subtle or non-existent.

Discussion

The two main access points for the north block are at Cold Creek and Fourteen mile. Trailhead improvements will occur as time and resources allow. A potential location for a trailhead has been identified within the NRCA along the Fourteenmile Road, however a more in-depth site analysis is needed. New signs would help to inform visitors of the boundary of the NRCA and permitted uses.

Management Actions

- Work with user groups to develop and install new signs with a positive message.
- Work with user groups to develop a site plan to serve permitted uses at access points.

Figure 7. Trails & Roads - North Block

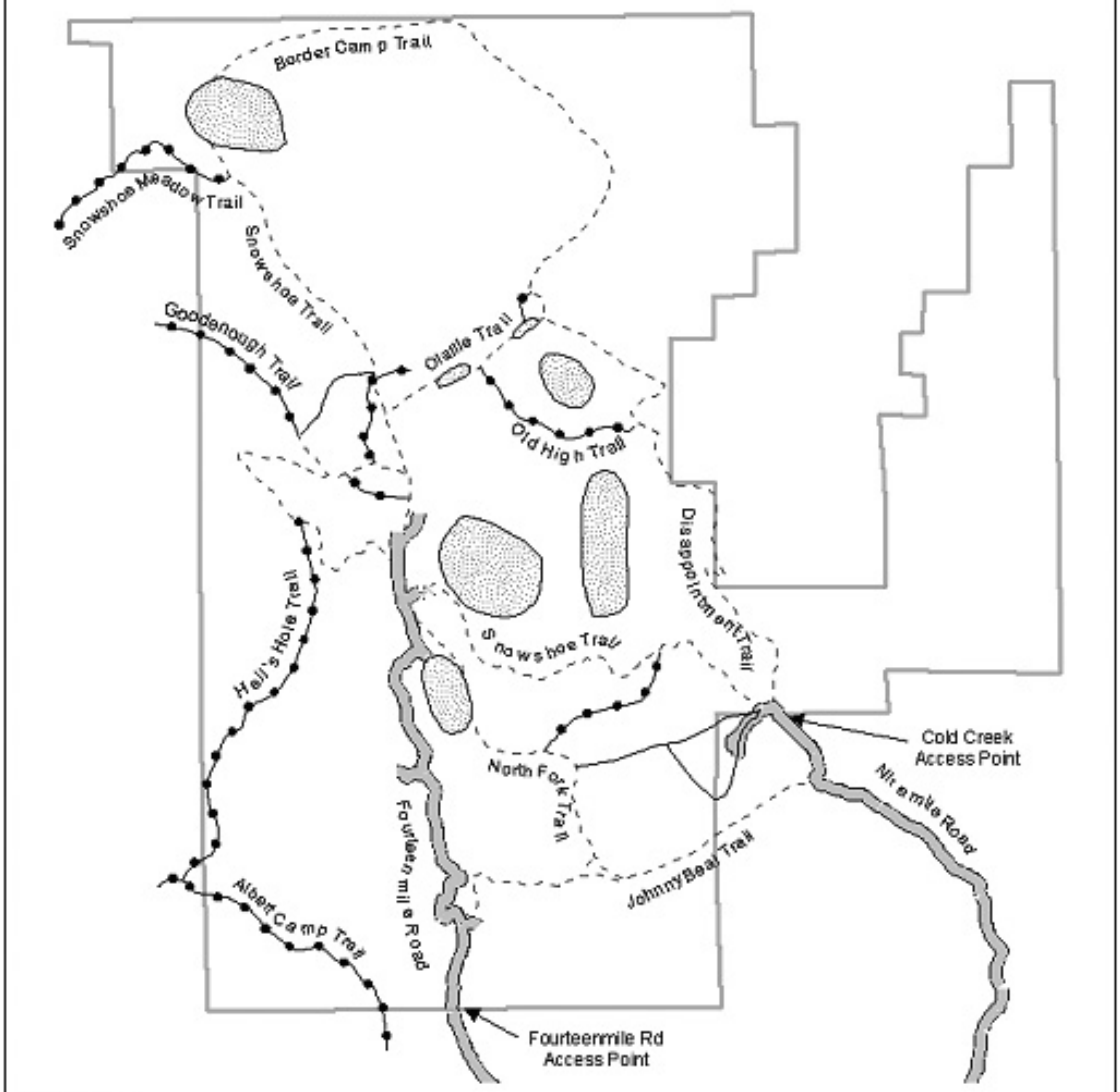
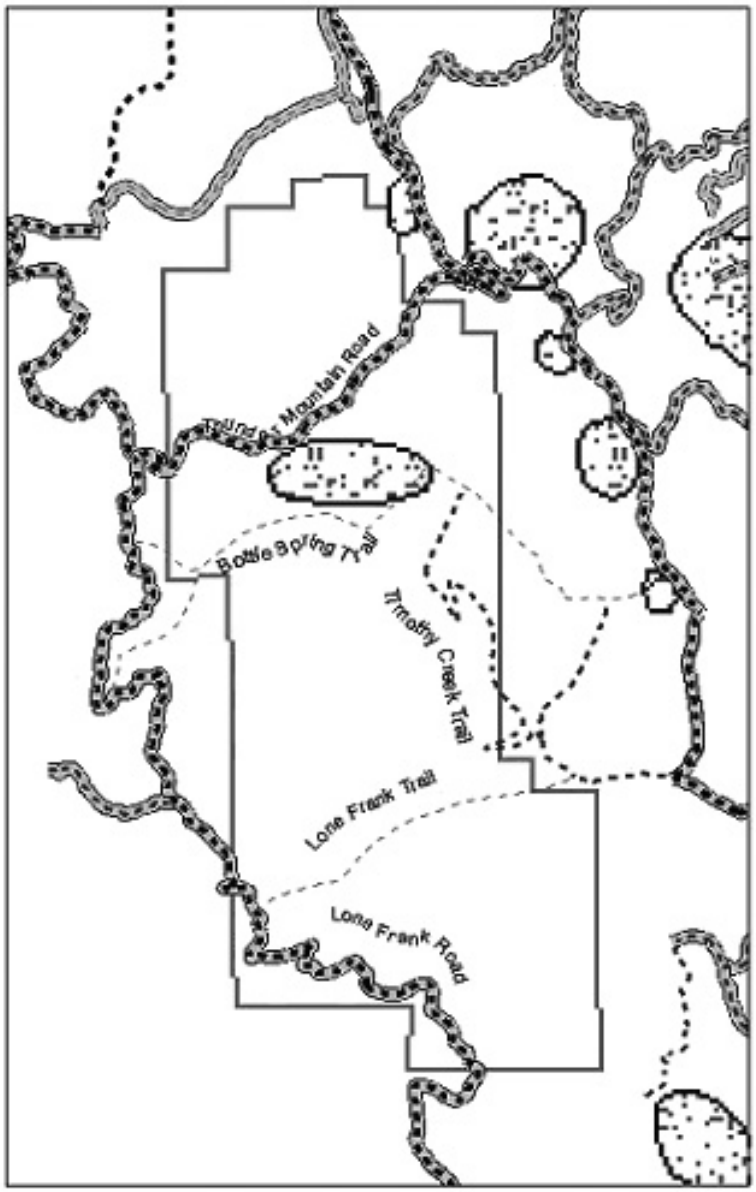


Figure 8. Trails & Roads - South Block



Legend

All SeasonTrails

- Heavy
- Moderate
- Light
- Roads
- Snowmobile Play Area
- Loomis NRCA

Motorized wheeled access is limited to roads.

Loomis NRCA Management Plan
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Recreation/Trails

The Statewide Management Plan for NRCAs defines low-impact public use as those activities that do not adversely affect the site's natural qualities. Specifically, activities shall not compromise a site's integrity, ecological, scenic, historic and archaeological values. However, for the Loomis NRCA, snowmobile use, and horseback riding are permitted uses. Hunting does occur and is regulated by the Washington Department of Fish and Wildlife. Figures 7 and 8 show the DNR approved trail system and the uses associated with each trail.

Discussion

The management emphasis for recreation in the Loomis NRCA is to maintain the current trail system with some improvements to trailheads, evaluation of trail locations and installation of signs. These improvements will help provide a safe recreational experience and contribute to the overall management goals of protecting sensitive resources. Uses are discussed in more detail below.

Snowmobiles

Snowmobile trails in the Loomis NRCA are un-groomed, discovery trails and receive a low level of use compared to other snowmobile trails in the Loomis State Forest. In general, trails in the Loomis NRCA are narrow with tight turns, cover difficult terrain through dense forest and are not conducive to high speeds. Management actions, including trail maintenance, should maintain these trail characteristics.

The U.S. Fish and Wildlife Service requested that DNR not allow any increase in designated or groomed over-the-snow snowmobile routes or snowmobile play areas within Lynx Management Units (this includes both blocks of the NRCA). Authorized trail routes and play areas are shown on figures 7 and 8. Furthermore, DNR will manage snowmobile use and will employ strategies to discourage inappropriate use.

Horseback Riding

Equestrian use in the area known today as the Loomis NRCA dates back to the 1890s when settlers hunted, trapped, and herded livestock. Today this user group has expanded to include a recreational riders who generally use the north block to access the Pasayten Wilderness in the summer months. The most popular trails for recreational riding are the Albert Camp Trail and the Snowshoe Trail. In general trails are rough and require maintenance to keep them clear of tree limbs as high as 8-10 feet. Horses are unloaded and loaded from trailers outside of the NRCA. The Bottle Spring and Lone Frank Trails in the south block are also used by horseback riders.

Structures

A few historic, uninhabitable remnants of structures are located in the north block and are used primarily as landmarks and safety shelters for sudden extreme weather. Historically these structures were built and maintained by users. For liability reasons, users are required to have approval to continue maintenance on the structures. DNR does not assume responsibility for the structures and any construction or improvement to these structures should be reviewed by, and coordinated with Northeast Region staff.

Trails (Roads)

Many of the trails located in the NRCA were established long ago by cattlemen herding cattle throughout the area. Some trails date back to when sheep herders worked the area. Over time trail use expanded to include other users and now the NRCA has several trails that serve cattlemen, recreational equestrians and hikers in the summer; snowmobilers, snowshoers and cross-country skiers in the winter and; hunters in the fall and winter.

In general trails vary greatly in the NRCA. Trail width ranges from 1 to12 feet and some trails are barely visible and others are obvious. Improvements are needed at stream crossings and wet areas. Trails are maintained by users to keep vegetation pruned back and some trails are marked with tree blazes.

Old road beds also contribute to the trail system. The Disappointment Trail (previously known as the Jeep Trail) which starts at the Cold Creek access point is an old, un-maintained road. It is closed to wheeled vehicles except for authorized site management and emergency vehicles. The portion of Fourteenmile Road within the NRCA was built in the late 1980s to haul timber and has created a new trail route and has changed the Snowshoe Trail where it intersects with the North Fork Trail.

Trailheads are not developed and coincide with gate locations. An open area at the Cold Creek “trailhead” provides places to park in the summer months. Equestrians unload their horses at the corrals south of Cold Creek Campground or at Fourteen Mile Recreation Site (USFS). See Access Section in the Land Use Chapter for more detail.

Management Actions

- Assess trail locations and impacts to natural resources and re-route or improve trails to increase user safety and resource protection.
- Develop a trail maintenance agreement with user groups.
- Bring together user groups annually to discuss trail maintenance issues and plan maintenance projects.
- Maintain trails in accordance with trail standards and guidelines outlined in the Guidelines Chapter of this plan.
- Maintain (keep vegetation trimmed back) the portion of Fourteenmile Road that extends into the Loomis NRCA for emergency vehicle access.

- Allow spur roads to revegetate and officially abandon through Forest Practices Rules and Regulations.

Permit Range Management (Grazing)

As already stated, the area now known as the Loomis NRCA has a long history of cattle grazing and several permit ranges overlap with the NRCA. The north block is part of the Chopaka Permit Range and the south block falls within four Permit Ranges: Toats Coulee, Cecile, Sarsapkin, and Salmon Meadows (see Figure #2). Fences and natural barriers delineate the permit ranges and contain cattle. Gate management is important for managing cattle. An important rule of the range is leaving gates as they are found.

Each permit range is managed according to a Coordinated Resource Management Plan and the plans are updated when permits are renewed (every 10 years). Permit holders meet annually with DNR and Natural Resources Conservation Service staff in the fall (Coordinated Resource Management meeting) to review the past grazing season and address specific management issues. In the spring the same group meets to review the grazing schedule for the upcoming season. The grazing schedule includes the turn-out date, total AUMs (animal unit month or cow/calf pair) and grazing schedule (refer to a range-specific Coordinated Resource Plans for more detail).

Generally cattle are herded out to the permit ranges in June and they move down to lower elevations in September and October. Turnout dates change depending on climate conditions. Cattle generally concentrate their grazing where the majority of forage and to some extent, water, are located. This includes open areas such as shrub-steppe, wet meadows, and harvested areas. They tend to avoid steep topography and dense forest.

Discussion

The Coordinated Resource Management Plans are the existing management framework for grazing practices in the NRCA and the Loomis State Forest. After the plans are updated, they will address the ecosystem standards in House Bill 1309. The ecosystem standards were designed to address the impacts of agricultural and grazing practices (on state-owned land) on fish and wildlife habitat. As a result, grazing practices within the Loomis NRCA will be guided by Coordinated Resource Management Plans associated with the permit ranges that overlap with the NRCA.

Management Actions

- Participate in Coordinated Resource Management Meetings and the permit renewal process.
- Use signs to remind users of the importance of closing gates.
- Implement management decisions from Coordinated Resource Management Meetings.

Environmental Education

Currently there is not an organized program or curriculum. However, the site is used occasionally for educational field trips.

Discussion

The Loomis NRCA is approximately 30 miles from Tonasket. Access is limited from November to May due to snow and facilities are rustic to non-existent. As a result, opportunities for groups of students to travel to the site during the school year are limited. However, the site is available for field studies. Research topics include, but are not limited to, wildlife, rare plants, weeds, disturbance ecology (including wildfire), or livestock grazing ecology.

Management Actions

- Conduct a site analysis to determine the site's capacity for outdoor environmental education.
- Identify features of educational value.
- Conduct a survey or interviews to identify environmental education needs of the local communities. Match needs appropriately with site capacity, educational opportunities and proximity to local education centers.
- Determine appropriate means such as brochures, self-guided tours, or interpretive signs for delivering the identified environmental message.
- Exhibit and distribute information on research opportunities to higher education institutions.

IV. MANAGEMENT GUIDELINES

Management actions outlined in the previous chapter pertain to specific management issues. This section provides guidance for implementing those actions and for addressing future management issues.

A. Sensitive Areas

Certain portions of the NRCA have been identified that may be particularly vulnerable to impacts from public use (including grazing, a permitted use) and fire suppression activities (Figures 9 and 10, Sensitive Areas Maps). These sensitive areas include pockets of habitat within the Loomis NRCA that support or have a high probability of supporting sensitive, threatened, or endangered plant and wildlife species. Direct impacts to these areas may damage populations of such species or their habitat. Where a high potential exists for sensitive areas to be impacted by public use or fire suppression activities, high impact activities should be redirected to other locations when possible. Additionally, sensitive areas (except rock/talus/cliff habitats) are high priority areas for monitoring efforts. Habitats identified as Sensitive Areas include:

Alpine/Subalpine Meadows – Vegetation is particularly sensitive to soil disturbance from machinery or heavy trampling. Once soil has been compacted or scrapped away, natural regeneration is significantly inhibited. Soil disturbance should be limited to the edges of these habitats as much as possible.

Wetlands and wet meadows – Soft hydric soils are easily compacted. Soil compaction can alter vegetation dynamics and may interrupt hydrologic functions. Many of the sensitive, threatened, or endangered plant and wildlife species known or suspected in the Loomis occur in wetland and wet meadow habitats.

Riparian habitat – Removing or crushing vegetation, and disturbing soils in riparian areas can increase erosion if stream banks are exposed. Soft hydric soils are easily compacted. Soil compaction can alter vegetation dynamics and may interrupt hydrologic functions.

Shrub-steppe and dry grassland openings - Vegetation is particularly sensitive to soil disturbance from machinery or heavy trampling. Areas of heavy soil disturbance may become vulnerable to weedy plants and noxious weeds. Regeneration of native species is difficult. Soil disturbance should be limited to the edges of these habitats as much as possible.

Aspen Stands – Aspen form colonies as new shoots sprout from a common system of roots. Conditions, such as overgrazing and fire suppression, may suppress aspen rejuvenation leading to an overall decline in aspen stands. Furthermore, aspen tend to grow in moist areas and the roots are vulnerable to compaction.

Rock/talus/cliffs - These habitats support or may support a disproportionately large number of the sensitive, threatened, or endangered plant and wildlife species. While not particularly vulnerable to public use activities, substantial movement of talus or rock should be avoided where possible.

Figure 9. Sensitive Areas - North Block

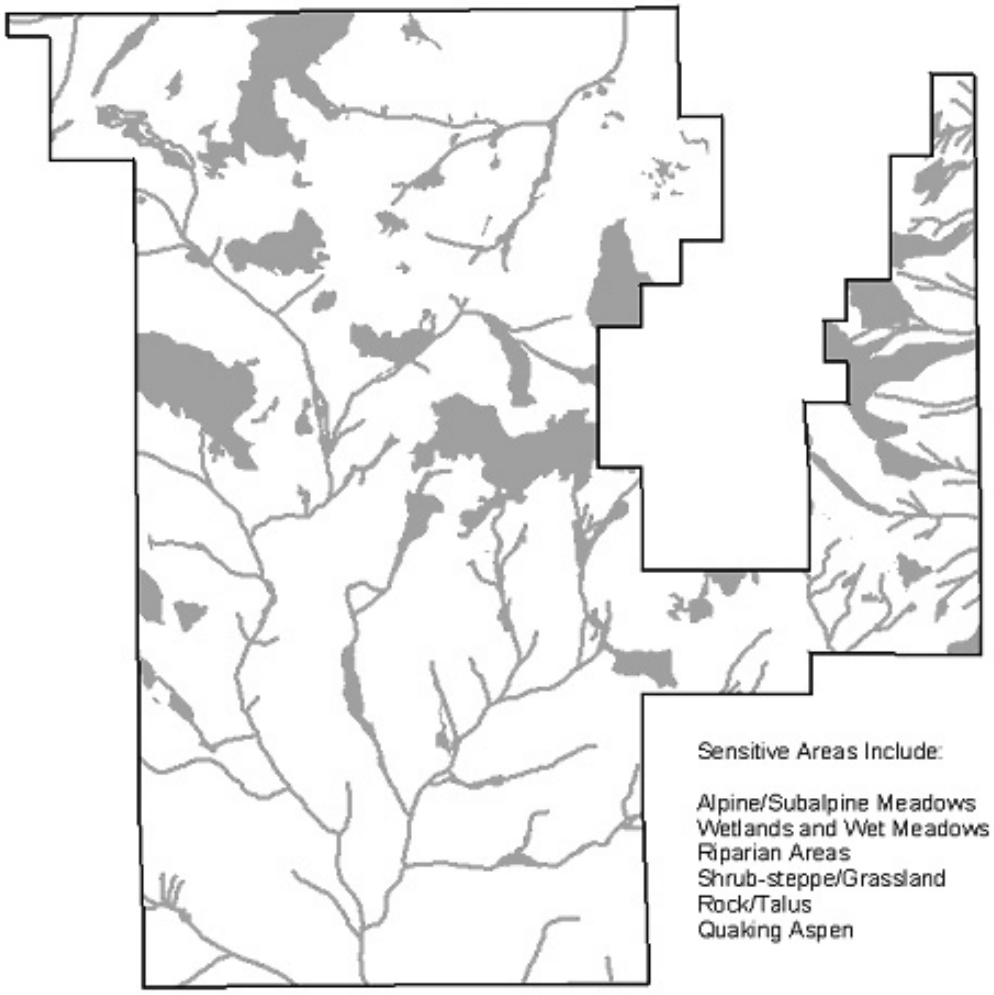

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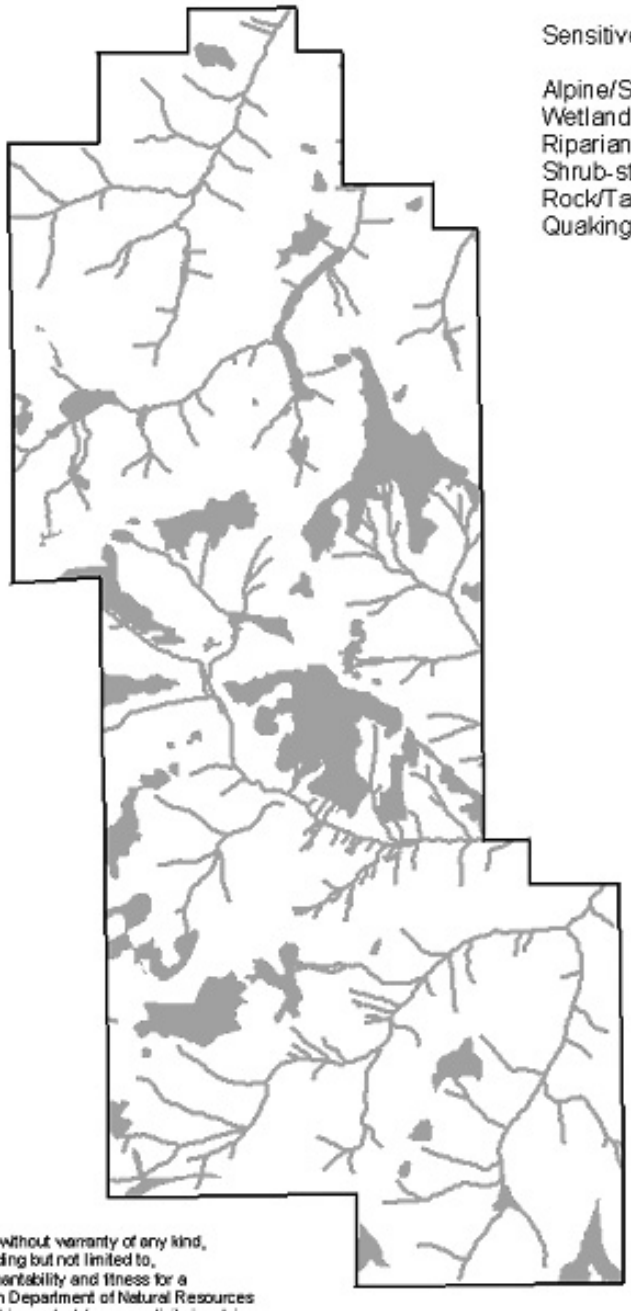
Figure 10. Sensitive Areas - South Block



Sensitive Areas Include:

Alpine/Subalpine Meadows
Wetlands and Wet Meadows
Riparian Areas
Shrub-steppe/Grassland
Rock/Talus
Quaking Aspen

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B. Fire

The Loomis NRCA is managed according to RCW 79.71 (NRCA Act) to protect natural processes and natural features. The NRCA is also subject to RCW 76.04.750 which states that "every reasonable effort will be made to suppress uncontrolled fires". Within the NRCA fire may produce beneficial effects and maintains fire-dependent resources, however the responsibility to protect life and adjacent land is paramount.

Fire Suppression

The immediate and short-term goal is to act safely and aggressively to suppress all uncontrolled fires while using discretion to minimize impacts to ecological systems. Loomis NRCA Fire Control Priorities are as follows:

1. Protect human life.
2. Protect adjacent land.
3. Minimize resource losses (fire suppression impacts to sensitive areas) and fire costs.

Wildfire Rehabilitation

Following a wildfire, the burned area should be allowed to regenerate without human intervention. Specific restoration activities may be needed to restore areas disturbed by fire suppression activities. Post-fire revegetation will not be undertaken unless natural revegetation is impeded or slowed to such an extent that the ecological features or processes in the area will be negatively impacted. Restoration efforts will be designed based on consultation with Natural Areas Ecologists. Burned areas may need protection from livestock until a restoration plan is in place.

Refer to the Loomis NRCA Fire Suppression Plan (Appendix E) for more detail.

C. Insects and Disease

Native insects and other pathogenic organisms are part of the NRCA's natural ecological conditions and processes. As such, intervention is not recommended when infestations and disease are the result of native organisms and natural processes. Exceptions include cases when: non-native, introduced insects or other pathogens create deleterious conditions; law (RCW 76.06.040) requires management action; or the primary features for which the NRCA was designated are jeopardized by lack of intervention.

The site will be monitored for the presence of bark beetles, satin moth and white pine blister rust and other insect and disease activity during routine site visits. If monitoring indicates substantial activity of the insects or pathogens described above, an entomologist or forest pathologist should be consulted regarding the severity of the activity and possible solutions. Pesticides will not be used, unless necessary to meet

legal requirements, in order to protect native insects, particularly pollinators for the rare plants. If white pine blister rust is found, the need for active management, including propagation and planting of resistant trees, prescribed fire or other methods to remove competing tree species**,** will be considered.

If monitoring indicates a need for management action, a Natural Areas Program Ecologist, in consultation with Department forest health specialists, will develop an insect and/or disease control plan. This plan will be attached as an addendum to this plan and will be implemented by the region. All management actions undertaken will be subject to obtaining necessary permits from other agencies.

D. Restoration

Restoration activities will be carried out to implement site recovery objectives in situations where allowing natural ecological and physical process to predominate would threaten the continued existence or condition of the primary features that the Loomis NRCA was intended to protect. Any ecological restoration activity should consider the following:

- Only native plant species will be used for revegetation. Exceptions may occur if a non-native species is determined to be critical for success and is not expected to persist long-term.
- When possible use plants and seeds from adjacent sites.
- Plant species selected should mimic natural plant communities and associations.
- When purchasing “native” species, find a local source and make sure that the origin of the stock supplied is from the same region and is the same variety.
- Do not use invasive native species that are likely to negatively impact adjacent native vegetation.
- Do not use “native species” that are not native to the site.
- Use soils from adjacent sites and when soils are imported, it is critical that they are sterilized to minimize the potential import of exotic weed species.

E. Public Use

The NRCA trails system was built and maintained by users. Trails need to be assessed. Improvements may include structures to protect water crossings, erosion control structures or signs. User groups have expressed an interest in helping with maintenance of the trail system. The following trail guidelines and standards are designed to protect natural resources and maintain a safe, multi-use experience. Some trails may need to be closed or re-routed.

Resource Protection – When using the NRCA trail system exercise caution when crossing areas that are wet, or have fragile plant communities (i.e. alpine meadows).

Trails can be a source of resource damage or impact if not properly designed and located on the landscape. If a trail in the NRCA is impacting a sensitive resource it will be assessed and a solution, such as structural improvements or re-routing, implemented. Other issues include, but are not limited to, silt in streams, out-of-control campfires and trash.

Backcountry Experience –The Loomis NRCA provides a backcountry (no improvements or facilities other than trails) type of hiking and camping experience however it is not classified as a wilderness area. Minimum impact camping methods are required to maintain the rustic nature of the site. Whatever is packed in must be packed out. Stewardship of the natural resources is an important part of using the NRCA and is appreciated by all users.

Both blocks of the Loomis NRCA are at high elevations. Weather is unpredictable and may be extreme. Being prepared for inclement weather during any time of the year is an important safety consideration. Currently (2002) the trail system is poorly marked and can be easily confused with game trails. Visitors should exercise caution when navigating the NRCA and use maps that are up to date and sufficient in detail.

Trail Etiquette – When encountering users on horseback, approach them slowly and with caution. Pedestrians should step aside to allow mounted riders and animals to pass by. A startled horse may cause the rider to lose control, be bucked off or cause injury. If the animal should break free, the rider may have to pursue the animal for some time and distance before gaining control again.

Wildlife – The Loomis NRCA includes a wide array of plants and wildlife. One of the more exciting opportunities of the Loomis NRCA is to see wildlife that are not common (i.e. lynx, bears, moose, etc.). When recreating in the NRCA, users are in wildlife habitat and should exercise caution for both the safety of the user and the wildlife. Wildlife with young offspring are likely to act aggressively to protect the young. If you encounter wildlife, keep a safe distance and do not attempt get closer and do not feed them. During winter months wildlife will most likely have to exert precious energy reserves to elude any further contact. This stress during a critical period can cause mortality or poor reproduction in the spring. Please exercise caution and consideration when viewing wildlife in the NRCA.

Structures - Trailheads, sign boards, bathroom facilitates, water crossings, and cabins or cabin remnants are important for many reasons. Maintenance, and repair of these structures resulting from vandalism can be expensive. Working with users and writing grants (by volunteers and DNR staff) to obtain funding is an important part of maintaining public access and historic use of the site. Donated labor is one of the most valuable benefits of working with user groups. Structures must be approved by DNR prior to construction and implementation and shall be of rustic design and blend into the natural features of the site.

Blazing – Blaze marks are located on two sides of a tree and are made by removing a patch of bark leaving a scar that is fairly uniform in appearance. These marks are usually visible from one to the other and denote the location of the trail. Less severe methods such as a dot of paint or orange metal diamond markers could also be used to mark trails. These marks need to be placed high enough so that the snow pack will not cover them in the winter. An inventory and site plan for marking trails and installing signs is a high priority. Trails will be marked by DNR staff or volunteers with written approval from NE Region or Natural Areas Staff.

Trail Standards - The following three trail types will be used to delineate trails in the Loomis NRCA. See figures 7 and 8.

Type – A – All Authorized Use Trail, All Season

Maximum Clearing Width:	8 feet (except roads 12 feet)
Maximum Clearing Height	10 feet
Marking Guidelines:	Signage and Blazes
Structure Standards:	Water Crossing, Trail Drainage and Hardening, Signage, Mileage Markers, Blazes
Users:	Cattle, Horses, Hikers, Snowmobiles

Discussion

This trail is maintained at our highest standard and can reasonably be expected to receive the most use. These trails are also the greatest risk to public resources and will be a priority for maintenance. These trails are also working trails that provide natural barriers for fire, corridors for herding cattle, and access for management purposes. Some areas of the trails overlap with old jeep trails and old logging roads which are kept open for emergency access.

Type – S – Summer Use Only Trail

Maximum Clearing Width:	varies 3-8 feet
Maximum Clearing Height	10 feet
Marking Guidelines:	Signage and Clear Path Blazing
Structure Standards:	Water Crossing, Trail Drainage and Hardening
Users:	Cattle, Horses, Hikers

Discussion

Summer Use trails also are work trails used to move livestock and provide excellent access for hikers, hunters, and equestrians. These trails are not old

roads but may date back to the 1890s. Trails are rough and difficult to maneuver. These trails should be inventoried and it is very likely that portions may need to be relocated into areas that are easier to maintain and pose less risk to users and resources. Maintenance of these trails is important because they serve as fire breaks, livestock drive-trails and provide access by foot, ATV, or horse for management purposes.

Type – W – Winter Use Only

Maximum Width:	Approximately 46 inches
Marking Guidelines:	Blazing
Structure Standards:	No Structures, No Trail Signs
Users:	Snowmobiles, Snowshoe Hikers and Cross-country Skiers

Discussion

Winter Use trails are trails that have been used historically by snowmobiles and were not used outside of the winter months. These trails will remain discovery trails to meet objectives outlined in the modified Lynx Habitat Management Plan. Thus trails designated for winter use will, be kept narrow (approximately 46" inches) and will require a skilled riders and low speeds. At least 12 –18 inches of down woody debris will be retained for the first 100 - 150 feet to discourage cattle, ATV users and foot traffic outside of the winter months. The DNR will continue to work with user groups to find effective solutions to minimize inappropriate use.

Research - New research activities within the NRCA must be pre-approved by the Natural Areas Ecologist. Existing research projects will continue and will be reviewed annually by Natural Areas Program staff. Research projects will be encouraged among potential research groups, such as colleges, universities, and relevant research laboratories. Sources of funding for specific research topics will be sought and applied for, as applicable. Potential partners for research projects and/or funding will also be sought.

Research proposals must follow Natural Areas Program Research Guidelines, which are available from the Region office. Official letters of project approval or denial including any specific conditions will be issued within approximately two weeks of receipt of a proposal. Multi-year projects will be re-evaluated and researchers notified of approval or denial to continue on a yearly basis.

F. Forestry Activities

At times, in order to aid the site's ecological maintenance, restoration or enhancement, certain forestry practices may be necessary. For example, ecological thinning to restore or maintain structural conditions within forested areas may be necessary. However, in those cases, timber harvest is not the objective of the management activity, but is of secondary or tertiary importance to the stewardship objectives being pursued. It is probable that the cut trees' quality will not be merchantable. Any income that would be generated would be incidental to the forest management practice itself and will be deposited in the Natural Area Stewardship Account (RCW 79.71). Any such decision would be made only after consultation with the Natural Areas Ecologist.

G. Archaeological, Cultural and Historic Sites

The continuation of activities that are part of tribal cultural values and reserved treaty rights are provided for within federal and state law and DNR policy. Specific tribal uses or cultural sites have not been identified to date, however state Office of Archaeology and Historic Preservation records shall be reviewed prior to the implementation of any management activity. If archaeological and/or historic sites are located within the Loomis NRCA, region natural areas staff will coordinate with a region or division archaeologist and representative(s) from affected tribes to protect them.

H. Hunting

Hunting is permitted according to the rules and regulations of the Washington Department of Fish and Wildlife.

I. Roads

As stated in the land transfer deed, "The state… reserves the right to use existing and proposed roads on the property, in locations identified in the land transfer deed (one in the north block, T40RR24E, Section 34, SE ¼ and in the south block, T37R24E, Section 8, S ½ SE ¼) as Timber Harvest Roads, where reasonably necessary to manage or remove forest products or other valuable materials from nearby state trust land without charge to the trust, but the trust shall pay its share of the road maintenance and repair cost. These roads shall only be built if no other reasonable and economically feasible alternate route can be built on the adjacent trust land."

J. Regulation and Law Enforcement

Uses and activities within the NRCA not consistent with the Department's policies and legal obligations shall be considered a violation against the department. DNR's existing law enforcement policies shall apply and will be enforced by DNR as funding allows.

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 reduce the number of violations. 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.

K. Weeds

Due to the high elevation and relatively short growing season, the potential severity of weed infestations is probably limited. Some shade tolerant species may be found below the 5000 – 5500 feet elevation, including common houndstongue (*Cynoglossum officinale*) and possibly St. John's wort (*Hypericum perforatum*). Other noxious weed species with notable potential to occur in the NRCA are Canada thistle (*Cirsium arvense*), diffuse knapweed (*Centaurea diffusa*), spotted knapweed (*Centaurea maculata*), Russian knapweed (*Acroptilon repens*), and possibly other knapweed species (*Centaurea* spp.). Canada thistle is most likely to be found in wet or moist disturbed areas, while knapweeds are more likely to occur along roads, in clearcuts, and other heavily or chronically disturbed areas. In the absence of large disturbances such as fire, road construction, or logging, these are not likely to spread significantly if they do become established.

V. IMPLEMENTATION

This plan will be implemented by DNR Natural Areas staff. Most of the management actions in this plan are focused in sensitive areas that overlap with public use or heavy grazing areas. Actions will be implemented as funding becomes available and the list will be used to coordinate active recruitment of funds and support for projects. Volunteer site stewards will play an important role in maintaining an active presence at the site and conducting regular visual inspections. Implementation is contingent upon cooperation and coordination among and with user groups.

Success of the plan will depend on efforts to monitor and evaluate the NRCA and to tailor the management of the site to meet changing conditions. Success also depends on maintaining good working relationships with users, adjacent land managers, land owners and associated agencies, while carrying out the intent and requirements of the NRCA Act and Settlement Agreement.

A. Summary of Management Actions

Forest Zones and Plant Communities

Sub-alpine fir zone

- Inventory and monitor the site for whitebark pine and monitor for occurrence of white pine blister rust.
- Coordinate with North Cascades National Park (and USFS) on monitoring the spread and potential management of white pine blister rust.
- Research options and opportunities to maintain the role of fire in the ecosystem.

Douglas-fir zone

- Assess the feasibility and effectiveness of creating fuel breaks in the Douglas fir zone

Quaking Aspen Forest

- Inventory and map aspen stands and seral conditions.
- Maintain aspen component at its current approximate acreage or greater with a mix of seral conditions at landscape scale.
- Consider the use of prescribed fire or mechanical disturbance within aspen stands if necessary to maintain mixed seral conditions.
- If evidence of insect or disease activity such as satin moth is observed, consult with DNR Forest Health staff to determine the degree of threat posed and appropriate actions.
- Work with Coordinated Resource Management group to implement range management practices to deter livestock from grazing in aspen stands.

Riparian and Wetlands

- Work with permit holders to achieve the Ecosystem Standards for State-owned Agricultural and Grazing Land.
- Maintain a mix of seral conditions throughout the NRCA where wetlands are dominated by native, non-increaser species and have a mix of shrub size classes where appropriate.
- Inventory and map riparian habitats
- Assess trails where they interface with wetlands.
- Relocate or recondition trails to address impacts to natural hydrologic and geomorphic processes.

Shrub Steppe

- Inventory and map seral conditions of shrub steppe communities.
- Maintain a mix of seral conditions in shrub-steppe communities throughout the NRCA.
- Work with permit holders to achieve Ecosystem Standards.

Sub-alpine/Alpine Grassland and Shrubland

- Maintain alpine communities dominated by native, non-increaser species, with few or no introduced species.
- Maintain a mosaic of shrub/herb-dominated communities and parkland communities.
- Survey/Inventory vegetation in alpine areas.
- Avoid trail development in alpine areas.
- Refer to Sub-alpine fir zone Management Actions for reference to Whitebark pine blister rust.
- Work with permit holders to achieve Ecosystem Standards.

Rock/Talus

- Map talus areas and survey them for rare plant and wildlife species.

Harvested Areas

- Monitor weed populations and if necessary develop and implement a weed control plan.
- Provide opportunities for research.

Plant Species

Rare Plants

- Maintain Ecosystem Standards to help ensure that viable populations of rare plant taxa continue to exist, subject to natural variations.
- Survey the project site for rare plants prior to ground disturbing projects.
- Systematically inventory the NRCA for other potential occurrences of sensitive, threatened or endangered plant species.
- Work with Natural Heritage botanists to determine appropriate monitoring scheme for two-spiked moonwort.

- Revisit known occurrences of state sensitive plants at least every three years at the appropriate time of year and update their status..

Noxious Weeds

- Conduct periodic inspections of areas with high potential for weed invasion, i.e. harvested and burned areas, roads and trails.
- Map and document occurrences of noxious weeds.
- Develop and implement weed control plans that use an integrated pest management approach and focus on minimizing impacts of the control methods while effectively controlling target weeds.

Wildlife Habitat

Late Successional Forest

- Allow late successional forest characteristics to develop through natural processes and natural ranges of variability.

Grizzly Bear

- Distribute and post safety procedures for avoiding contact with grizzly bear.

Gray Wolf and Wolverine

- Coordinate with Fish and Wildlife Service, and Washington Department of Fish and Wildlife to determine trail closure dates, locations and other potential management actions.

Canada Lynx

- Coordinate with US Fish and Wildlife Service and Washington Department of Fish and Wildlife to meet lynx habitat protection goals and objectives outlined in the Modified Lynx Habitat Plan.
- Adapt management actions as additional research is provided.

Northern Goshawk

- Consider potential impacts of management and recreational activities around known and potential nest sites.

Alpine Butterflies

- Management actions are the same as those outlined for the subalpine/alpine grassland and shrubland plant communities (see the Forest Zones and Plant Communities section).

Special Interest Species

- Maintain an awareness of indicator species and their natural range of variation.
- Support Washington Department of Fish and Wildlife and the Canadian Wildlife Service efforts to monitor and maintain bighorn sheep populations.

Non-Native and Introduced Animals

- Conduct periodic inspections of the site for non-native wildlife species.
- As non-native wildlife species are discovered, sightings and disturbance to the site should be

documented, and if necessary work with the Department of Fish and Wildlife to develop a control plan.

Land Use

Access

- Work with user groups to develop and install new signs with a positive message.
- Work with user groups to develop a site plan for each access point that serves permitted uses.

Recreation/Trails

- Assess trail locations and impacts to natural resources and re-route or improve trails to increase user safety and resource protection.
- Develop a trail maintenance agreement with user groups.
- Bring together user groups annually to discuss trail maintenance issues and plan maintenance projects.
- Maintain trails in accordance with trail standards and guidelines outlined in the Guidelines Chapter of this plan.
- Maintain (keep vegetation trimmed back) the portion of Fourteenmile Road that extends into the Loomis NRCA for emergency vehicle access.
- Allow spur roads to revegetate and officially abandon through Forest Practices Rules and Regulations.

Permit Range Management

- Participate in Coordinated Resource Management Meetings and the permit renewal process.
- Use signs to remind users of the importance of closing gates.
- Implement management decisions from coordinated Resource Management Meetings.

Environmental Education

- Conduct a site analysis to determine the site's capacity for outdoor environmental education.
- Identify features of educational value.
- Conduct a survey or interviews to identify environmental education needs of the local communities. Match needs appropriately with site capacity, educational opportunities and proximity to local education centers.
- Determine appropriate means such as brochures, self-guided tours, or interpretive signs for delivering the identified environmental message.
- Exhibit and distribute information on research opportunities to higher education institutions.

B. Summary of Monitoring and Research Needs

Monitoring is an examination of change over time and is used to help determine if management activities are producing the desired results. Monitoring may include simple visual inspections of plant species and plant communities every year or few years, or in the case of particularly rare or sensitive species and communities, designed monitoring plans may be warranted. Currently, some designed monitoring occurs within the NRCA in association with Resource Management Plans for permit ranges. This monitoring is designed to assess forage utilization as well as resource conditions related to HB1309 Ecosystem Standards. Natural Areas staff will coordinate with the Coordinated Resource Management group on permit range monitoring activities.

Monitoring

Visual Monitoring

- Monitor for occurrence of white pine blister rust. Coordinate with USFS.
- Monitor weed populations in disturbed areas and if necessary develop and implement a weed control plan.

Other Monitoring Needs

- Work with Natural Heritage botanists to determine appropriate monitoring scheme for two-spiked moonwort.
- Monitor status and condition of sensitive areas (aspen, wetland/riparian, shrub-steppe and alpine habitats).

Research

- Research options and opportunities to maintain the role of fire in the ecosystem.
- Fire history and ecology of the area.

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APPENDICES

A. Legal Boundary Description

Loomis NRCAs – Okanogan County

NORTH BLOCK (TOWNSHIP 40)

In Township 40 North, Range 24 East, W.M.

Section	Subdivision
1	E½SE¼
2	GOV LOT 4; SW¼NW¼; W½SW¼; SE¼SW¼
3	ALL (Fractional Section)
4	ALL (Fractional Section)
5	ALL (Fractional Section)
6	GOV LOT 1-3; S½NE¼; SE¼
8	ALL
9	ALL
10	ALL
11	NW¼; NW¼SW¼
12	SE¼SW¼; E½
13	E½NW¼NW¼; E½NW¼; SW¼; E½
15	W½; W½E½; S½SE¼SE¼
16	ALL
17	ALL
20	ALL
21	ALL
22	ALL
23	S½
24	ALL
26	N½N½
27	ALL
28	ALL
29	ALL
32	ALL
33	ALL
34	ALL

TOTAL ACRES NORTH BLOCK: 13,991.72

SOUTH BLOCK (UPPER SINLAHEKIN)

In Township 38 North, Range 23 East, W.M.

Section	Subdivision
13	S½SE¼
23	SE¼
24	ALL
25	ALL
26	E½
35	E½
36	ALL

In Township 38 North, Range 24 East, W.M.

18	GOV LOT 4
19	GOV LOT 1-4; E½W½; S½SE1/4
29	W½W½
30	ALL (Fractional Section)
31	ALL (Fractional Section)
32	W½W½

In Township 37 North, Range 23 East, W.M.

1	ALL (Fractional Section
12	ALL
13	ALL
24	N½

In Township 37 North, Range 24 East, W.M.

5	GOV LOT 4; SW¼NW¼; W½SW¼
6	ALL (Fractional Section)
7	ALL (Fractional Section)
8	W½NW¼; SW¼; S½SE¼
17	ALL
18	ALL (Fractional Section)
19	GOV LOT 1-2; E½NW¼; E½
20	ALL

TOTAL ACRES SOUTH BLOCK: 10,677.97

TOTAL ACRES (North and South) **24,669.69**

B. Bureau of Land Management Wilderness Study Area

The following information is from the Chopaka Wilderness Study conducted in 1982.

A threatened and endangered plant inventory was conducted, and eight species proposed for State Listing were found in and near the study area.

The eight sensitive plant species are:

Draba aurea	yellow drabe
Dodecatheon pulchellum var. *wattsonii*	few-flowered shooting star
Potentilla quinquefolia	five-leaved cinquefoil
Potentilla nivea	snow cinquefoil
Potentilla diversifolia var. *perdissecta*	diverse leaved cinquefoil
Salix tweedyi	Tweedy's willow
Gentiana glauca	glaucous gentian
Carex scirpoidea var. *scirpoidea*	Canadian single spike sedge

C. Status Categories for Wildlife and Plants

U.S. Fish and Wildlife Service Status Categories for Wildlife and Plants

Candidate - Plants and animals that have been studied and the Service has concluded that they should be proposed for addition to the Federal endangered and threatened species list. These species have formerly been referred to as category 1 candidate species. From the February 28, 1996 Federal Register, page 7597: "those species for which the Service has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list but issuance of the proposed rule is precluded."

Endangered - The classification provided to an wildlife or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.

Threatened - The classification provided to an wildlife or plant likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Washington Natural Heritage Program Status Categories for Vascular Plants

Plant taxa are assigned a statewide status by the Washington Natural Heritage Program. The state Endangered Species Act in Washington does not include provisions to list or protect plant species. Therefore, the lists included in the Endangered, Threatened and Sensitive Vascular Plants of Washington with Working Lists of Rare Non-Vascular Species (1997) have no statewide legal authority; they are advisory only. This publication serves as the most current reference on the status of Washington's rare plant taxa (WA Natural Heritage Program 1997). The first four of the six categories (endangered, threatened, sensitive and, possibly extinct or extirpated in Washington) are intended to convey the relative degree of threat that individual taxa are under in Washington and consequently, the level of concern and protection that each should receive (WA Natural Heritage Program 1997).

Endangered - This status is assigned to each vascular plant taxon in danger of becoming extinct or extirpated in Washington within the near future if factors contributing to its decline continue. Populations of these taxa are at critically low levels or their habitats have been degraded or depleted to a significant degree.

Threatened - Any taxon likely to become Endangered in Washington within the foreseeable future if factors contributing to its population decline or habitat degradation or loss continue.

Sensitive - Any taxon that is vulnerable or declining and could become Endangered or Threatened in the state without active management or removal of threats.

Possibly Extinct or Extirpated from Washington - Based on recent field searches, a number of plant taxa are considered to be possibly extinct or extirpated from Washington. Taxa in this group are all high priorities for field investigations. If found, they will be assigned one of the above status categories.

Review - This category consists of two groups of taxa for which more information is needed to accurately assess their status. Group 1 (i.e. R1) includes taxa for which additional field work is needed before a status can be assigned. Group 2 (i.e. R2) includes taxa with unresolved taxonomic questions.

Watch - This status is assigned to each vascular plant taxon that is more abundant and/or less threatened in Washington than previously assumed. Although the Washington Natural Heritage Program does not focus on these taxa, information about them is still gathered and stored in our information system.

Washington State Department of Fish and Wildlife Species Status Categories for Wildlife

Species of Concern in Washington include those species listed as State Endangered, State Threatened, State Sensitive, or State Candidate, as well as species listed or proposed for listing by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service.

State Endangered Species is defined in WAC 232-12-297, Section 2.4, to include "any wildlife species native to the state of Washington that is seriously threatened with extinction throughout all or a significant portion of its range within the state."

State Threatened Species is defined in WAC 232-12-297, Section 2.5, to include "any wildlife species native to the state of Washington that is likely to become an endangered species within the foreseeable future throughout a significant portion of its range within the state without cooperative management or removal of threats."

State Sensitive Species is defined in WAC 232-12-297, Section 2.6, to include "any wildlife species native to the state of Washington that is vulnerable or declining and is likely to become endangered or threatened throughout a significant portion of its range within the state without cooperative management or removal of threats."

State Candidate Species is defined in WDFW Policy M-6001 to include fish and wildlife species that the Department will review for possible listing as State Endangered, Threatened, or Sensitive. A species will be considered for designation as a State Candidate if sufficient evidence suggests that its status may meet the listing criteria defined for State Endangered, Threatened, or Sensitive.

Global and State Ranking System

The ranking system used by the Natural Heritage Network facilitates a quick assessment of a taxon's global and state rarity. Each taxon is assigned both a global (G) and state (S) rank of 1 to 5. The rank is based on the number of known occurrences, quality of habitat, number of individuals, population and habitat trends, threats, etc. All state (S) ranks have been assigned by the Washington Natural Heritage Program. Global (G) ranks have been assigned by various state Natural Heritage Programs (WA Natural Heritage Program 1997). Some species have two G ranks or two S ranks and this indicates uncertainty between two ranks.

State Rank

State rank characterizes the relative rarity or endangerment within the state of Washington. Factors including, but not limited to, number of known occurrences are considered when assigning a rank. Two codes together represent an inexact range (e.g., S1S2) or different ranks for breeding and non-breeding populations (e.g., S1B, S3N).

Values and their definitions:

S1 = Critically imperiled in the state because of extreme rarity or other factors making it especially vulnerable to extirpation from the state. (Typically 5 or fewer occurrences or very few remaining individuals or acres)

S2 = Imperiled in the state because of rarity or other factors making it very vulnerable to extirpation from the state. (Typically 6 to 20 occurrences or few remaining individuals or acres)

S3 = Rare or uncommon in the state. (Typically 21 to 100 occurrences)

S4 = Widespread, abundant, and apparently secure in state, with many occurrences, but the taxon is of long-term concern. (Usually more than 100 occurrences)

S5 = Demonstrably widespread, abundant, and secure in the state; believed to be ineradicable under present conditions.

SH = Historical occurrences only are known, perhaps not verified in the past 20 years, but the taxon is suspected to still exist in the state.

SP = Potential for occurrence of the the taxon in the state but no occurrences have been reported.

SR = Reported in the state but without persuasive documentation which would provide a basis for either accepting or rejecting the report (e.g., misidentified specimen).

SRF = Reported falsely in the state but the error persists in the literature.

SU = Uncertain. Possibly in peril in the state, but status is uncertain. More information is need.

SX = Believed to be extirpated from the state with little likelihood that it will be rediscovered.

S? = Not yet ranked. Sufficient time and effort have not yet been devoted to ranking of this taxon.

Qualifiers are sometimes used in conjunction with the State Ranks described above:

B - Rank of the breeding population in the state.

N - Rank of the non-breeding population in the state.

B and N qualifiers are used to indicate breeding and non-breeding rank of migrant species whose non-breeding rank may be quite different from their breeding rank in the state (e.g., S1B, S4N for a very rare breeder that is a common winter resident).

? qualifier is used with numeric ranks to denote uncertainty; more information may be needed to assign a rank with certainty. The '?' qualifies the character it follows (e.g., SE? denotes uncertainty of exotic status).

SnSn Two codes (i.e., S1S2) are used to indicate a range of ranks.

Global Rank

Global rank characterizes the relative rarity or endangerment of the element world-wide. Factors including, but not limited to, number of occurrences are considered when assigning a rank.

Values and their definitions:

G1 = Critically imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction. (Typically 5 or fewer occurrences or very few remaining individuals or acres).

G2 = Imperiled globally because of rarity or because of some factor(s) making it very vulnerable to extinction throughout its range. (6 to 20 occurrences or few remaining individuals or acres).

G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single western state, a physiographic region in the East) or because of other factors making it vulnerable to extinction throughout its range. (21 to 100 occurrences)

G4 = Widespread, abundant, and apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery. Thus, the Element is of long-term concern. (Usually more than 100 occurrences)

G5 = Demonstrably widespread, abundant, and secure globally, though it may be quite rare in parts of its range, especially at the periphery.

GU = Unrankable. Possibly in peril range-wide but status uncertain. More information is needed.

G? = Not yet ranked. Sufficient time and effort have not yet been devoted to ranking of this taxon.

Qualifiers are used in conjunction with the Global Ranks described above:

Tn Where n is a number or letter similar to those for Gn ranks, above, but indicating subspecies or variety rank. For example, G3TH indicates a species that is ranked G3 with this subspecies ranked as historic.

Q = Questionable. Taxonomic status is questionable and the numeric rank may change with taxonomy.

? = The specified rank is uncertain; more information may be needed to assign a rank with certainty.

GnGn Two codes (i.e., G1G2) are used to indicate a range of ranks.

D. Common and Scientific Names

Common Name	Scientific Name
Plants	
California brome	*Bromus carinatus*
Canada thistle	*Cirsium arvense*
Cascade azalea	*Rhododendron albiflorum*
Cheatgrass	*Bromus tectorum*
Cinquefoil	*Potentilla sp.*
Common houndstongue	*Cynoglossum officinale*
Common snowberry	*Symphoricarpos albus*
Desert-parsley	*Lomatium sp.*
Diffuse knapweed	*Centaurea diffusa*
Dogwood bunchberry	*Cornus canadensis*
Douglas fir	*Pseudotsuga menziesii*
Engelmann spruce	*Picea engelmannii*
Groundsel	*Senecio sp.*
Grouse huckleberry	*Vaccinium scoparium*
Heartleaf arnica	*Arnica cordifolia*
Horsetail	*Equisetum sp.*
Idaho fescue	*Festuca idahoensis*
Kinnikinnick	*Arctostaphylos uva-ursi*
Knapweed	*Centaurea spp.*
Labrador tea	*Ledum glandulosum*
Lodgepole pine	*Pinus contorta var. latifolia*
Low huckleberry	*Vaccinium myrtillus*
Lupine	*Lupinus sp.*
Mountain big sagebrush	*Artemisia tridentata ssp. vaseyana*
Mountain snowberry	*Symphoricarpos oreophilus*
Mountain sorrel	*Oxyria digyna*
Ninebark	*Physocarpus malvaceus*

Plants Continued

Pachistima	*Pachistima myrsinites*
Pinegrass	*Calamagrostis rubescens*
Ponderosa pine	*Pinus ponderosa*
Prairie smoke	*Geum triflorum*
Purple oniongrass	*Melica spectabilis*
Pussytoes	*Antennaria sp.*
Quaking aspen	*Populus tremuloides*
Rush	*Juncus sp.*
Russian knapweed	*Acroptilon repens*
Sedge	*Carex sp.*
Shiny-leaf spirea	*Spirea betulifolia*
Snowbrush	*Ceanothus sp.*
Spotted knapweed	*Centaurea maculata*
Spotted saxifrage	*Saxifraga broncialis*
St. John's wort	*Hypericum perforatum*
Starry false Solomon seal	*Smilacina stellata*
Strawberry	*Fragaria sp.*
Subalpine fir	*Abies lasiocarpa*
Twinflower	*Linnaea borealis*
Two-spiked moonwort	*Botrychium paradoxum*
Western larch	*Larix occidentalis*
Western wheatgrass	*Pascopyrum smithii*
Wheeler bluegrass	*Poa nervosa*
Whitebark pine	*Pinus albicaulis*
Willow	*Salix sp.*
Yarrow	*Achillea millefolium*

Wildlife

Beaver	*Castor canadensis*
Black bear	*Ursus americanus*
Black-backed woodpecker	*Picoides arcticus*

Bobcat	*Lynx rufus*
Boreal chickadee	*Poecile hudsonicus*
Boreal owl	*Aegolius funereus*
California bighorn sheep	*Ovis canadensis*
Canada lynx	*Lynx canadensis*
Chipmunk	*Tamias sp.*
Clark's nutcracker	*Nucifraga columbiana*
Cougar	*Felis concolor*
Coyote	*Canis latrans*
Elk	*Cervus elaphus*
Gray wolf	*Canis lupus*
Great gray owl	*Strix nebulosa*
Grizzley bear	*Ursus arctos horribilis*
Ground squirrel	*Spermophilus sp.*
Marmot	*Marmota caligata*
Moose	*Alces alces*
Mountain goat	*Oreamnos americanus*
Mule deer	*Odocoileus hemionus*
Northern bog lemming	*Synaptomy borealis*
Pine grosbeak	*Pinicola enucleator*
Raven	*Corvus corax*
Red squirrel	*Tamiasciurus hudsonicus*
Snowshoe hare	*Lepus americanus*
Spruce grouse	*Falcipennis canadensis*
Stellar jay	*Cyanocitta stelleri*
Three-toed woodpecker	*Picoides tridactylus*
White-tailed deer	*Odocoileus virginianus*
White-tailed ptarmigan	*Lagopus leucurus*
Wolverine	*Gulo gulo luscus*

Loomis NRCA
Fire Suppression Plan

April 2003

Summary

Introduction

The purpose of this plan is to guide fire suppression activity for all uncontrolled fire regardless of origin. Pre-suppression and fuel management activities will be addressed in the Loomis Natural Resources Conservation Area Management (NRCA) Plan. The Loomis NRCA Fire Suppression Plan includes information that will facilitate fire suppression efforts and optimize the protection of the most sensitive resources, in a manner that is most compatible with the management goals of the Loomis NRCA.

Geographic Context

Lack of access, minimal natural firebreaks, heavy fuel types, adjacent land owners/nations, and remote location, make for a challenging fire fighting scenario in the Loomis NRCA. Due to the high potential for a catastrophic fire in the Loomis NRCA, decisions made during initial attack will determine the range of fire fighting techniques available to safely and effectively suppress fire. Both blocks of the Loomis NRCA are contiguous with other public land (State Trust Land, DNR Natural Area Preserve, USFS, Bureau of Land Management, and Canada Protected Area) and the associated land managers meet yearly to discuss fire management issues.

Sensitive Areas

Sensitive areas include pockets of habitat within the NRCA that support or have a high probability of supporting Sensitive, Threatened, or Endangered plant and animal species. Alpine/subalpine meadows, wetlands and wet meadows, riparian habitat, shrub-steppe & dry grassland openings, and rock/talus/cliffs are all sensitive areas. Fire suppression objectives include: communicate and coordinate with resource protection staff and land managers of adjacent land, suppress fire safely, respond quickly, and minimize impacts from fire suppression activities, especially in sensitive areas.

Fuels

Fires are most common in July and August, with fires occurring anytime approximately June through October. The majority of the fuels in the Loomis NRCA are created by the sub-alpine forests. The natural fire regime for sub-alpine forests is infrequent with fires burning, on average, every 70-300 years and with high intensity. Several other vegetation types with similar fire regimes are scattered throughout both conservation area parcels and include fuel models 1, 3, 6, 8, 9, 10, 11 & 12 defined by the National Forest Fire Laboratory.

Policies

The Loomis NRCA is managed according to RCW 79.71 (NRCA Act) to protect natural processes and natural features. The NRCA is also subject to RCW 76.04.750 which states that “every reasonable effort will be made to suppress uncontrolled fires”. Within the NRCA fire may produce beneficial effects and maintains fire-dependent resources, however the responsibility to protect life and adjacent land is paramount.

Wildfire Suppression

DNR is responsible for fighting fire in the Loomis NRCA. Unlike natural resources on trust lands, the natural resources in the NRCA do not require protection from fire however, people and adjacent land do. The immediate and short-term goal is to act safely and aggressively to suppress all uncontrolled fires while using discretion to minimize impacts to ecological systems. Loomis NRCA Fire Control Priorities are as follows:

1. Protect human life.
2. Protect adjacent land.
3. Minimize resource losses (fire suppression impacts to sensitive areas) and fire costs.

A key action to the success of fighting fire in the Loomis NRCA will be employing suppression techniques that minimize disturbance to the environment (Light hand on the Land Techniques and Minimum Impact Suppression Tactics) by DNR fire managers and firefighters. Natural Area Managers will attend and teach short sessions at local district fire schools. The Highlands Fire School will also receive special training on fighting fire in the Loomis NRCA.

Post-Fire

Rehabilitation of the site after a fire will be left to natural processes as much as possible. In addition to the usual erosion and weed control practices, the level of disturbance and relative location to sensitive resources will be assessed to determine how much of the area will be left to recover naturally and how much will be actively restored.

Table of Contents

I. SITE DESCRIPTION

Location

The Loomis Natural Resource Conservation Area (NRCA) includes two separate parcels (or blocks) and encompasses approximately 24,600 acres located in Okanogan County, Washington. The two parcels are part of the Loomis State Forest and are located 20 miles west and northwest of Tonasket. The northern block is comprised of 13,822 acres located in Township 40 North, Range 24 East, W.M. The southern block is approximately 10,782 acres located at the four corners of Township 37 North, Range 23 East; Township 37 North, Range 24 East; Township 38 North, Range 23 East; Township 38 North, Range 24 East. WM.

Access

The main vehicle access to the two blocks is by forest roads through the Loomis State Forest. Forest roads are accessed from the Sinlahekin County road and the Loomis Oroville Road. A secondary USFS road connects the Thunder Mt. Road. It enters the southern block from the west off of the USFS 39 road.

Topography

The northern block is mountainous and includes Disappointment Peak and Snowshoe Mountain. Several other peaks are located in the Chopaka Natural Area Preserve. These mountains have elevation greater than 7,600 feet and drain into basins of creeks that leave the NRCA at an elevation of approximately 4,800 feet. Most of the area drains to the south into the North Fork of Toats Coulee Creek and a small portion of the area drains north into Canada. The topography varies from undulating high elevation grasslands and sedge meadows to forested mountain slopes, steep cliffs and talus.

The southern block includes several peaks that border the area and several creeks that drain into either Sinlahekin or Toats Coulee Creeks. The elevation ranges from approximately 7,000 feet to 5,200 feet. The topography on the southern block is not as extreme as the northern block and has high elevation grass lands, forested slopes, cliffs and talus slopes.

Climate

Average annual precipitation in the Loomis NRCA is between 18 to 40 inches. Average yearly snowfall varies with elevation, but represents the majority of the precipitation. Winters are cold and long with frost coming any month of the year and frozen ground starting in late October and ending in May depending on the exposure of the slope. Summers are short and dry with frequent electrical storms.

Predominant winds are generally from the southwest or west for much of the year, with periods of more northerly flow during the summer. Occasional strong east, or foehn, winds develop when high pressure air moves toward low pressure off the coast. Severe fire events throughout much of the Pacific Northwest are often associated with strong northerly winds or east winds during summer months.

Local wind patterns typically move air down slopes and valleys in the morning, reversing direction in the afternoon. Therefore, wind movement on the site is typically west to east in the morning and east to west in the afternoon depending upon aspect and topography.

Fire Seasons

Fire season usually lasts from mid to late summer, although fires may occur anytime from approximately June through October depending on weather conditions. The Loomis NRCA is in an area with high potential for lightning storms which most often occur in July and August.

Hydrology

Both blocks have creeks that range from intermittent to perennial with many seeps and springs. Most of the streams are intermittent at the highest elevations, becoming more seasonal at lower elevations. The northern block contains much of the head-waters to the North Fork Toats Coulee Creek. The southern block contains some headwaters for both Sinlahekin Creek and South Fork of Toats Coulee Creek.

Sensitive Areas

Certain portions of the NRCA have been identified that may be particularly vulnerable to impacts from fire suppression activities (Appendix A, Sensitive Areas Maps). These sensitive areas include pockets of habitat within the Loomis NRCA that support or have a high probability of supporting sensitive, threatened, or endangered plant and animal species. Direct impacts to these areas, especially from heavy machinery and helicopter landings, may damage populations of such species or their habitat. Where a high potential exists for sensitive areas to be impacted by fire suppression activities, high impact activities should be redirected to other locations when possible, while still meeting fire suppression goals of protecting life and property. Habitats identified as Sensitive Areas include:

Alpine/Subalpine Meadows – Vegetation is particularly sensitive to soil disturbance from machinery or heavy trampling. Once soil has been compacted or scrapped away, natural regeneration is significantly inhibited. Soil disturbance should be limited to the edges of these habitats as much as possible.

Wetlands and wet meadows – Soft hydric soils are easily compacted by machinery. Soil compaction can alter vegetation dynamics and may interrupt hydrologic functions. Many of the sensitive, threatened, or endangered plant and animal species known or suspected in the Loomis occur in wetland and wet meadow habitats. Soil disturbance should be limited to the edges of these habitats as much as possible.

Riparian habitat – Removing or crushing vegetation, and disturbing soils in riparian areas can increase erosion if stream banks are exposed. Soft hydric soils are easily compacted by machinery. Soil compaction can alter vegetation dynamics and may interrupt hydrologic functions.

Shrub-steppe & dry grassland openings - Vegetation is particularly sensitive to soil disturbance from machinery or heavy trampling. Areas of heavy soil

disturbance are likely to be colonized by weedy plants and noxious weeds. Regeneration of native species is difficult. Soil disturbance should be limited to the edges of these habitats as much as possible.

Rock/talus/cliffs - These habitats support or may support a disproportionately large number of the sensitive, threatened, or endangered plant and animal species. While not particularly vulnerable to fire suppression activities, substantial movement of talus or rock should be avoided where possible.

Fuels and Fire Regimes

Vegetation, dead and alive, provides fuel for fire and plays a major role in determining where a fire occurs and how it burns . The majority of the Loomis NRCA consists of subalpine fir zone forest (primary source of fuel), most of which is dominated by lodgepole pine. Sub-alpine forests burn infrequently and with high intensity. A small amount of Douglas-fir zone forest occurs at the lowest elevations of both blocks and comprises only a small percentage (less than 5%) of the total NRCA. Other minor vegetation types (secondary sources of fuel) include: shrub steppe, alpine, aspen, wetland plant communities, and harvested areas. Rock outcroppings and talus are natural fuel breaks and may be incorporated in fire suppression tactics.

Fuel loads vary from site to site and among plant communities. Fuel models 1,3,6,8, 9, 10, 11 & 12 (Anderson, 1982) are the most likely scenarios used to describe fire behavior in the Loomis NRCA (See Appendix B for detailed description of vegetation, fuel models and associated fire regimes).

Adjacent Land

The Loomis NRCA is surrounded by public land. The northern block is bordered by the Snowy Mountain Protected Area in Canada to the north, Pasayten Wilderness to the west, Loomis State Forest to the south, and Bureau of Land Management to the east. The Chopaka Natural Area Preserve is located within the northern block.

The southern block is bordered by the Okanogan-Wenatchee National Forest to the south and west and the Loomis State Forest to the north and east.

The land adjacent to the Loomis NRCA is managed to achieve a wide range of land management goals and objectives. Fire that burns on or into the NRCA and threatens to burn onto adjacent land will require coordination with affected land managers to address fire suppression tactics and strategies. Unless a formal agreement has been made, fires that cross boundaries can create a difficult administrative climate for dealing with the physical and financial impacts of fire. Agreements are in place with the BLM, USFS, and British Columbia that explain how a fire will be managed should it burn near an ownership change or administrative boundary (Appendix C, Northwest Wildland Fire Protection Agreement, 1977). In the future, agreements should be reviewed to incorporate any changes as a result of management planning or policy changes.

Jurisdiction

DNR has fire fighting responsibility within the Loomis NRCA. Fire suppression tactics will be employed according to laws and policies of the DNR. During fire suppression efforts, a Natural Areas Program representative (Appendix D) will be available to advise the incident commander regarding the protection of sensitive resources. It is also recognized that the USFS, BLM and BC Forest Service have reciprocal fire agreements for initial attack with DNR. Inter-agency and international coordination is a common function for fire suppression forces. Sharing information about NRCA fire suppression from the administrative level to the fire fighter level will strengthen the understanding of the land designation and what suppression tactics are most appropriate.

II. POLICIES

The Loomis NRCA is subject to two conflicting policies, the fire suppression RCW which mandates that all fires shall be suppressed and the NRCA RCW that requires that natural processes be protected. The two policies are described below. Fire suppression priorities and objectives for the Loomis NRCA (Section III) are designed to fully meet the requirements of the fire suppression RCW and, to the extent possible, take into consideration land management requirements outlined in the NRCA RCW.

Fire Suppression RCW

The Loomis NRCA is subject to the fire suppression RCW (76.04.750) which states that… "Any fire, on or threatening any forest land, burning uncontrolled and without proper action being taken to prevent its spread, notwithstanding the origin of the fire, is a public nuisance by reason of its menace to life and property. Any person engaged in any activity on such lands, having knowledge of the fire, notwithstanding the origin or subsequent spread thereof on his or her own or other forest lands, and the landowner, shall make every reasonable effort to suppress the fire".

The priorities (Policy 20-001 Fire Suppression) of the Department's fire control program are (in order) to:

1. protect human life,
2. protect natural resources, and
3. minimize resource losses and fire costs.

Natural Resources Conservation Areas RCW

The Loomis NRCA is managed under the Natural Resources Conservation Areas Act, RCW 79.71. Natural Resources Conservation Areas (NRCAs) are managed for conservation purposes to protect high quality examples of typical or unique features including habitat for threatened, endangered, and sensitive species, exceptional scenic landscapes and geologic features in Washington State. NRCAs also provide opportunities for low-impact recreation and outdoor environmental education as long as such uses do not adversely affect the natural features an area is intended to protect.

III. WILDFIRE SUPPRESSION

Discussion

In general, the subalpine fir zone forests in the Loomis NRCA are typical of seral forests maintained by fire in the Okanogan region. Seral forests contain species (lodgepole pine in this case) that generally do not reproduce in their own shade or without some form of disturbance. High elevation lodgepole pine stands are dependant on fire for regeneration. When fire is suppressed, lodgepole pine trees age and die allowing climax species such as Engelmann spruce and sub-alpine fir to gradually arise under the shade of the undisturbed seral species and eventually become the prominent species with a different forest structure.

Past stand replacement fires in and around the Loomis NRCA occurred close enough together to create large areas of relatively even-aged lodgepole pine forest. As the trees reached 80–120 years in age in the late 1980s and early 1990s beetle populations reached epidemic levels. Host trees have been significantly depleted by the beetles and as a consequence, beetle populations are decreasing. The natural progression of the system is for fire to burn the fuels created by the beetles. Most of the area has high levels of fuel, has a natural tendency for stand replacement type fires and natural fuel breaks are sparse. The likelihood of a fire consuming thousands of acres at a time is high.

The preferred option for dealing with wildfire from the perspective of maintaining natural systems, thus protecting the natural resource, would be to allow an area to burn while maintaining enough control to keep the fire contained within the NRCA or at least keep it from burning adjacent resources that require protection from fire. Firefighter safety would remain the top priority along with protecting human life. However, due to the natural widespread accumulation of fuel, minimal fire breaks and the fact that the DNR is mandated to suppress all wildfire, all uncontrolled fires will be suppressed in the NRCA. The maintenance of fire dependent plant communities will depend on prescribed fire, pre-approved with a burn permit.

The #2 priority listed for Fire Control in the Fire Suppression RCW is “protect natural resources”...from fire. As discussed above, the natural resources in the Loomis NRCA do not require protection from fire, however some natural resources adjacent to the NRCA do need protection from fire. Thus, for the purposes of this fire suppression plan, protecting adjacent land is the second priority. Furthermore, in the context of this plan, “minimize resource losses” refers to minimizing damage to sensitive areas.

Loomis NRCA Fire Control Priorities:

1. Protect human life
2. Protect adjacent land
3. Minimize resource losses (impacts to sensitive areas) and fire costs

Objective 1: Communicate and coordinate with Resource Protection staff and land managers of adjacent land.

- Review Loomis NRCA land management objectives and associated suppression tactics in fire training sessions.
- Contact a Natural Areas Program Representative (Northeast Region Natural Areas staff or the Natural Areas Eastside Ecologist) should be contacted when a fire is reported in, or threatening the NRCA.
- Follow procedures for contacting adjacent landowners and permit holders.

Objective 2: Suppress fire safely.

Fire fighter safety is dependant on many factors. Major factors that contributed to firefighter fatalities of the last century have been terrain, isolation, delayed response, limited response time, lack of adequate safety zones and escape routes, communication difficulties, and strategies/tactics that were not in line with predicted fire behavior. The Loomis NRCA lands face the same issues. The time of greatest threat to life is when a fire transitions rapidly from small to large.

- Follow standard personnel safety standards ("Fire Orders" and "Watchouts")
- **(L)ookouts –** Post an experienced, competent and trusted individual who has knowledge of fire behavior, local weather patterns, the fire personnel's location and their escape routes.
- **(C)ommunication -** Maintain communication throughout the fire's activity with all personnel, updating as to any changes in the fire behavior, weather activity or safety concerns.
- **(E)scape Routes-** More than one escape route is needed. Routes must be scouted and identified prior to safe use.
- **(S)afety Zones-** These areas need to be survivable without a fire shelter. The areas may be of natural origin or created. Area must be scouted, identified with flagging or markers and easily accessible by the fire line personnel.

Objective 3: Respond quickly.

- Check for public presence, location and notification. Post warning signs at (but not limited to) three locations for northern block: Cold Creek, 14 mile and at Iron Gate. In the southern block: USFS 39 road, Lone Frank Road, Thunder Mountain Road, Sinlahekin Road and South Fork of the Toats Coulee Road.
- Consult with Natural Areas Program representative to establish road access and helicopter landing areas to aid fire suppression.

Small, Low Intensity Fires:

- Review location, fuel conditions, agreements with adjacent landowners, weather, likelihood of spread, direction and availability of suppression resources. Determine appropriate response and parties to notify.
- Act quickly and decisively in mobilizing resources due to the long response times to the remote location. Expect limited resources the first hour and what the fire will do, given all the conditions that contribute to fire growth.
- Consider aircraft especially Type 2 & 3 helicopters for fast deployment of firefighters into remote locations and inaccessible areas. This can also aid in the delivery of water and logistical support (caution: high elevation air density reduces load capabilities of aircraft). Smoke - jumpers are another consideration with short response time and special training in difficult terrain.
- Another option to consider is para-cargo planes from the cache at North Cascades Smokejumper Base.
- Support and coordination through Canadian aircraft.

Larger, More Intense Fires:

More than likely, some fires will become large and difficult to contain or control. All control measures are acceptable for the objective of containing this type of fire.

- Ask dispatch to notify the Northeast Region Range Permit Administrator, who will notify permit holders that their stock may be in danger and may assist with the coordination of livestock rescue.
- Notify adjacent land managers.
- Once the fire is contained, measures will be immediately taken to reduce continued disturbance to the area while maintaining control of the fire.

Objective 4: Minimize impacts from fire suppression activities, especially in sensitive areas.

Fire Suppression:

- Burning out to existing firebreaks (roads, cattle trails, rock out crops) is preferable to the construction of new fire lines.
- Water and hand tools will be used to stop the spread of the fire, except under extreme conditions, or if improved structures or other key cultural resources are threatened. Crews will be directed to use M.I.S.T. tactics where applicable.
- In extreme conditions when foam/retardant, and bulldozers are necessary, try and take the opportunity to place fire lines along fence lines, roads, trails, existing vegetation breaks, and ownership boundaries. Foam and retardants are preferable to bulldozers.
- When feasible avoid sensitive areas (see Sensitive Areas Map).
- When applicable, fire vehicles should be confined to roads and bulldozer trails.
- Trees and snags should not be felled unless they pose a danger to firefighters.

Mop-Up:

Mop-up situations are governed by availability of crews, equipment, terrain, as well as current and predicted weather. These conditions makes it more difficult to use a fixed set of rules during mop-up, particularly on the boundaries of the Natural Area and the Canadian Border. Mop up activities should be done with as much care as possible, to minimize impacts to the site, use the following guidelines:

- To the extent possible, water will be used to extinguish the fire to prevent the disturbance of the soil and vegetation area (verses dry mopping,).
- Let the fire burn to containment/confinement/control perimeter line.
- When feasible, conduct mop-up activities at the site boundary and avoid the interior as much as possible. In most cases at least 100 feet inside the fire lines have to be completely put out as soon as possible.

IV. POST-FIRE

Seeding and erosion and weed control will be coordinated with a Natural Areas Advisor and/or the Natural Areas Eastside Ecologist. Natural Areas staff will fully assess burned areas and if necessary will develop a restoration plan according to management guidelines in the Loomis NRCA Management Plan. Generally, all fire trails will be rehabilitated and the site will be allowed to regenerate naturally. However, areas disturbed by fire suppression activities may need to be restored. Large (20+ acres) burned areas may impact grazing rotations. The effects of a fire on grazing will be addressed at Coordinated Resource Management meetings. Implementation of restoration activities should occur before snowfall or the following spring season.

Any road opened for fire suppression activities will be closed off after all suppression activities are completed in the area.

V. REFERENCES

Agee, J.K. 1993. Fire Ecology of Pacific Northwest Forests. Island Press. Washington, D.C. 493pp.

Anderson, H.E. 1982. Aids to Determining Fuel Models For Estimating Fire Behavior. Boise Interagency Fire Center, BLM Warehouse, Boise, Idaho.

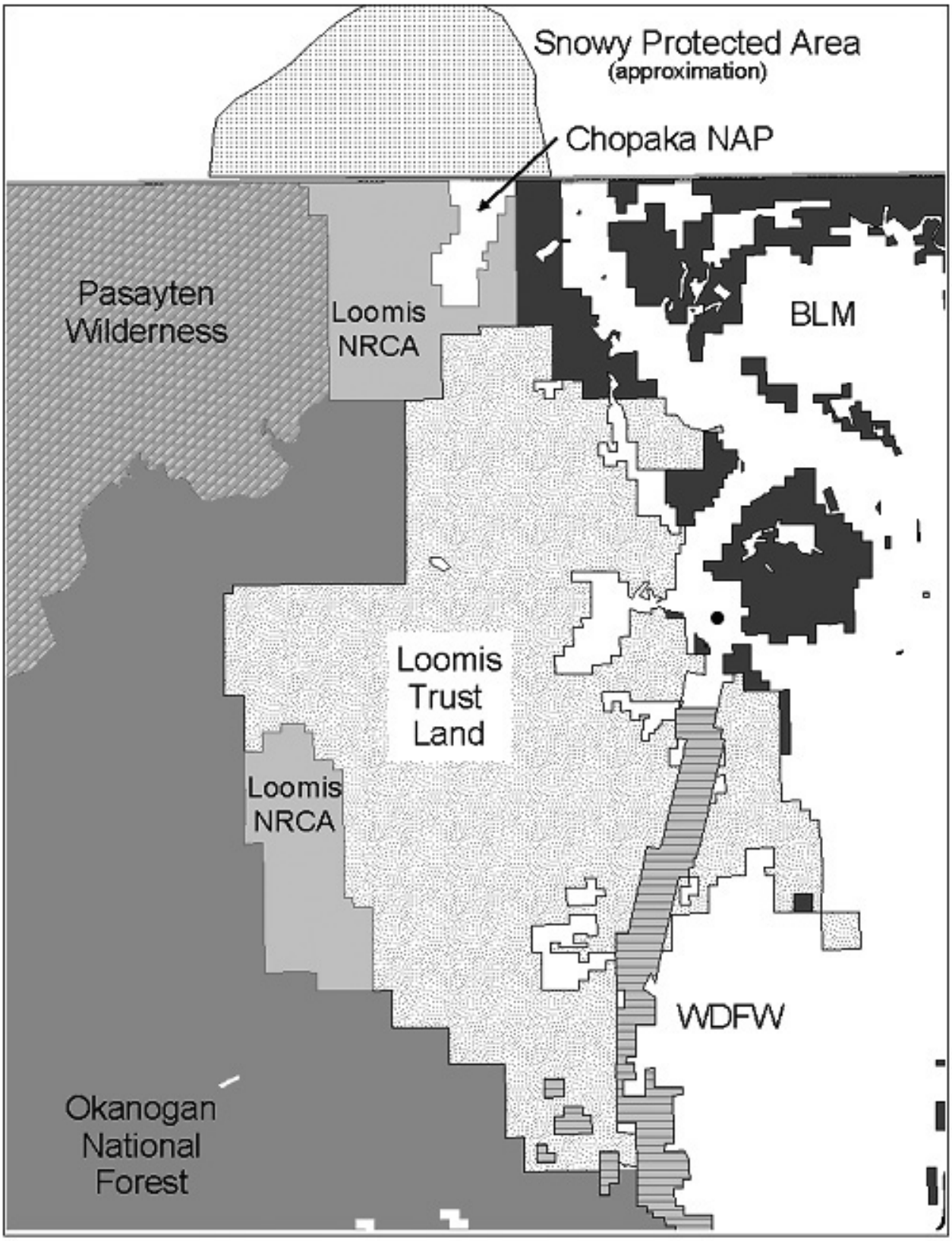
VI. APPENDICES

Appendix A: Maps

Appendix B: Fuels and Fire Regimes

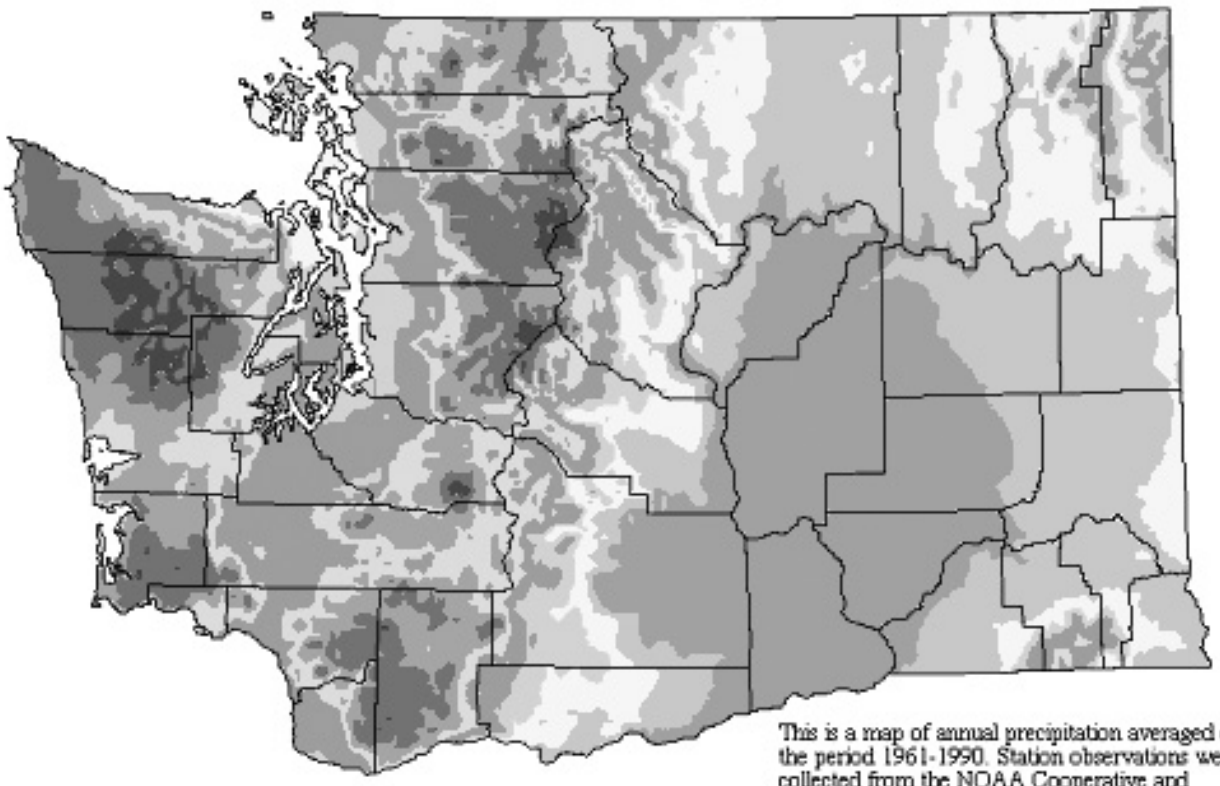
Appendix C: The Northwest Wildland Fire Protection Agreement

Appendix A: Maps



Average Annual Precipitation

Washington



This is a map of annual precipitation averaged over the period 1961-1990. Station observations were collected from the NOAA Cooperative and USDA-NRCS SnoTel networks, plus other state and local networks. The PRISM modeling system was used to create the gridded estimates from which this map was made. The size of each grid pixel is approximately 4x4 km. Support was provided by the NRCS Water and Climate Center.

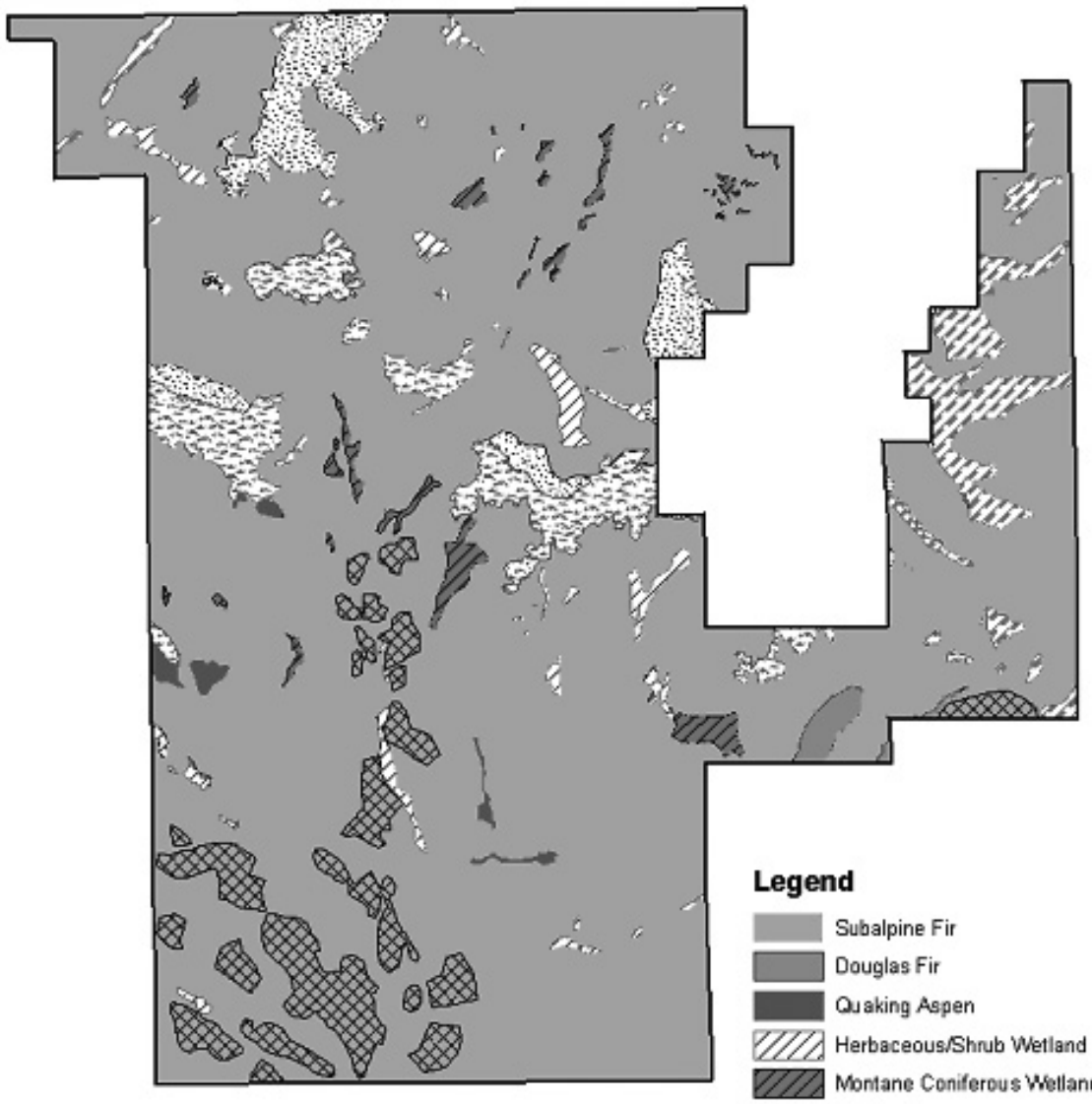
Legend (in inches)

Under 10	60 to 80
10 to 20	80 to 100
20 to 30	100 to 140
30 to 40	140 to 180
40 to 60	Above 180

For information on the PRISM modeling system, visit the SCAS web site at http://www.ocs.orst.edu/prism

The latest PRISM digital data sets created by the SCAS can be obtained from the Climate Source at http://www.climatesource.com

Vegetation - North Block



Loomis NRCA Management Plan
April 2003

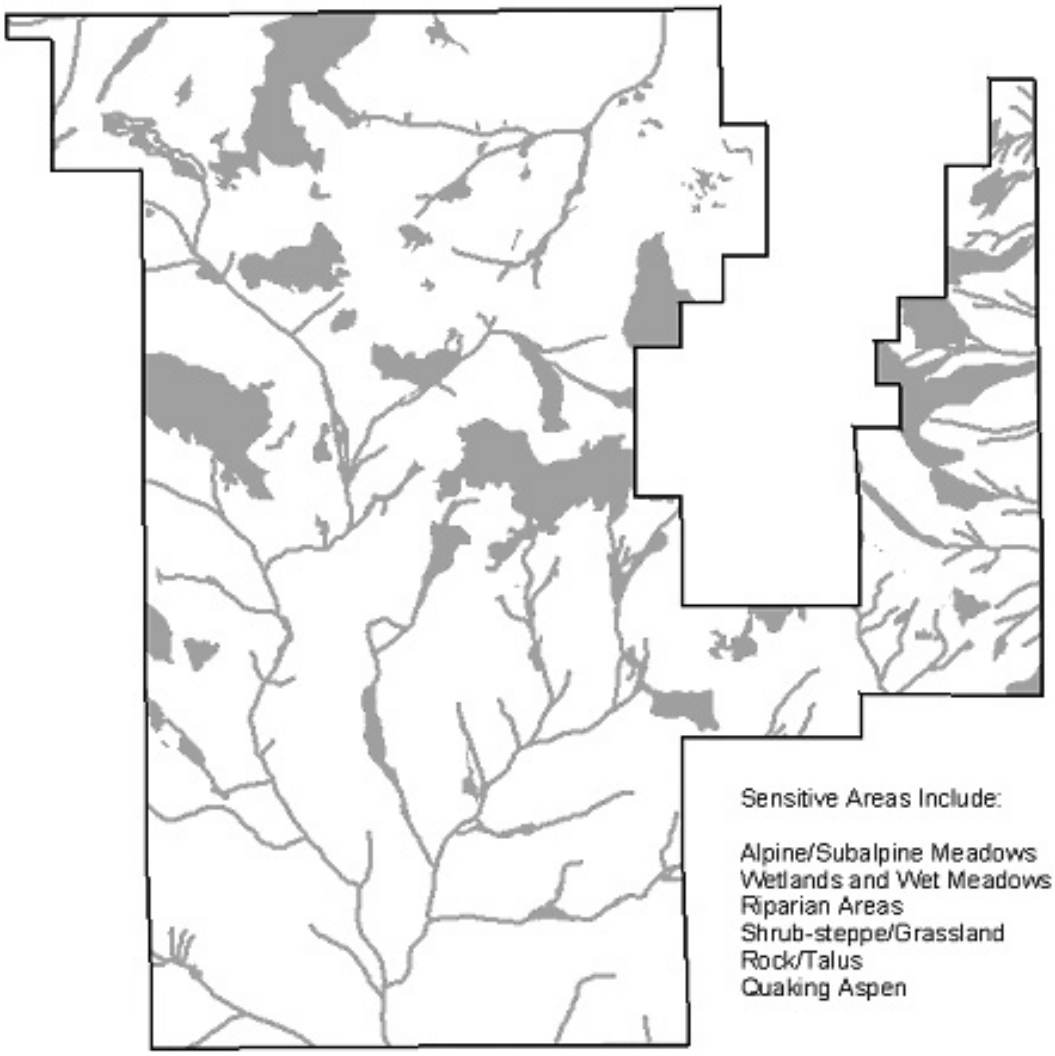
Vegetation - South Block

Legend

- Subalpine Fir
- Douglas Fir
- Quaking Aspen
- Herbaceous/Shrub Wetland
- Montane Coniferous Wetland
- Shrub-steppe
- Alpine
- Rock/Talus
- Harvested Areas

Loomis NRCA Management Plan
April 2003

Sensitive Areas - North Block

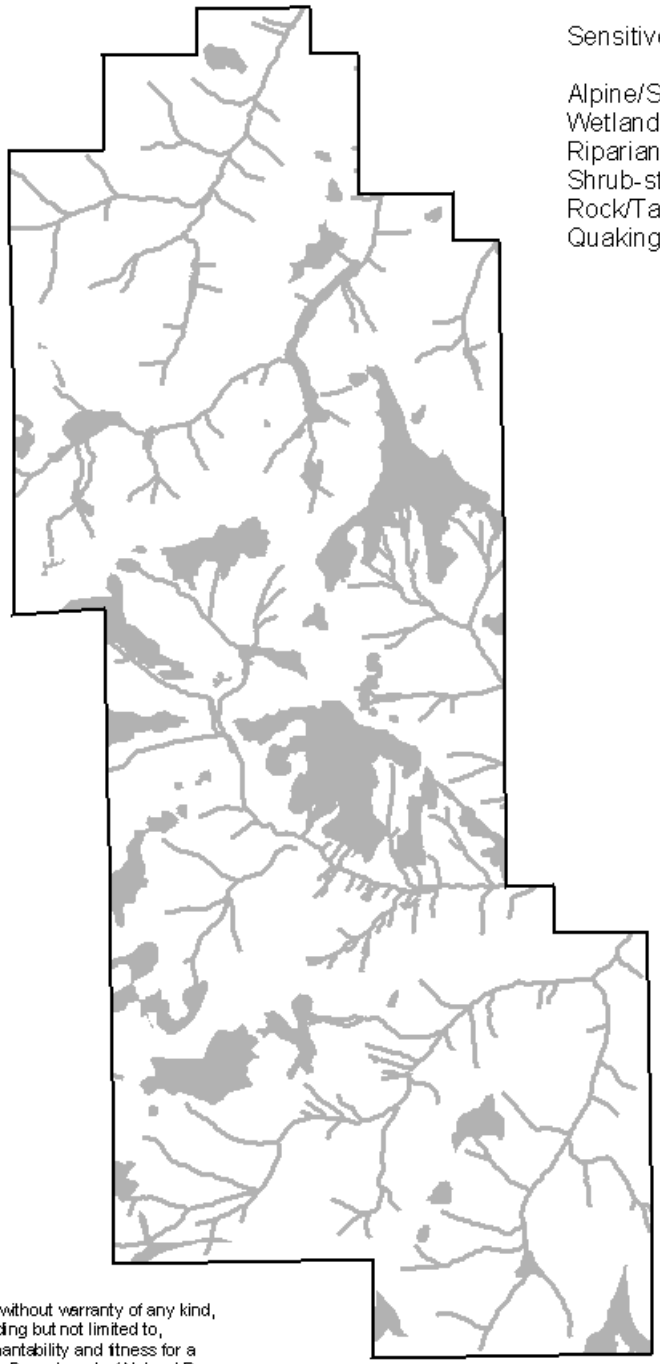


Sensitive Areas Include:

Alpine/Subalpine Meadows
Wetlands and Wet Meadows
Riparian Areas
Shrub-steppe/Grassland
Rock/Talus
Quaking Aspen

Loomis NRCA Management Plan
April 2003

Sensitive Areas - South Block



Sensitive Areas Include:

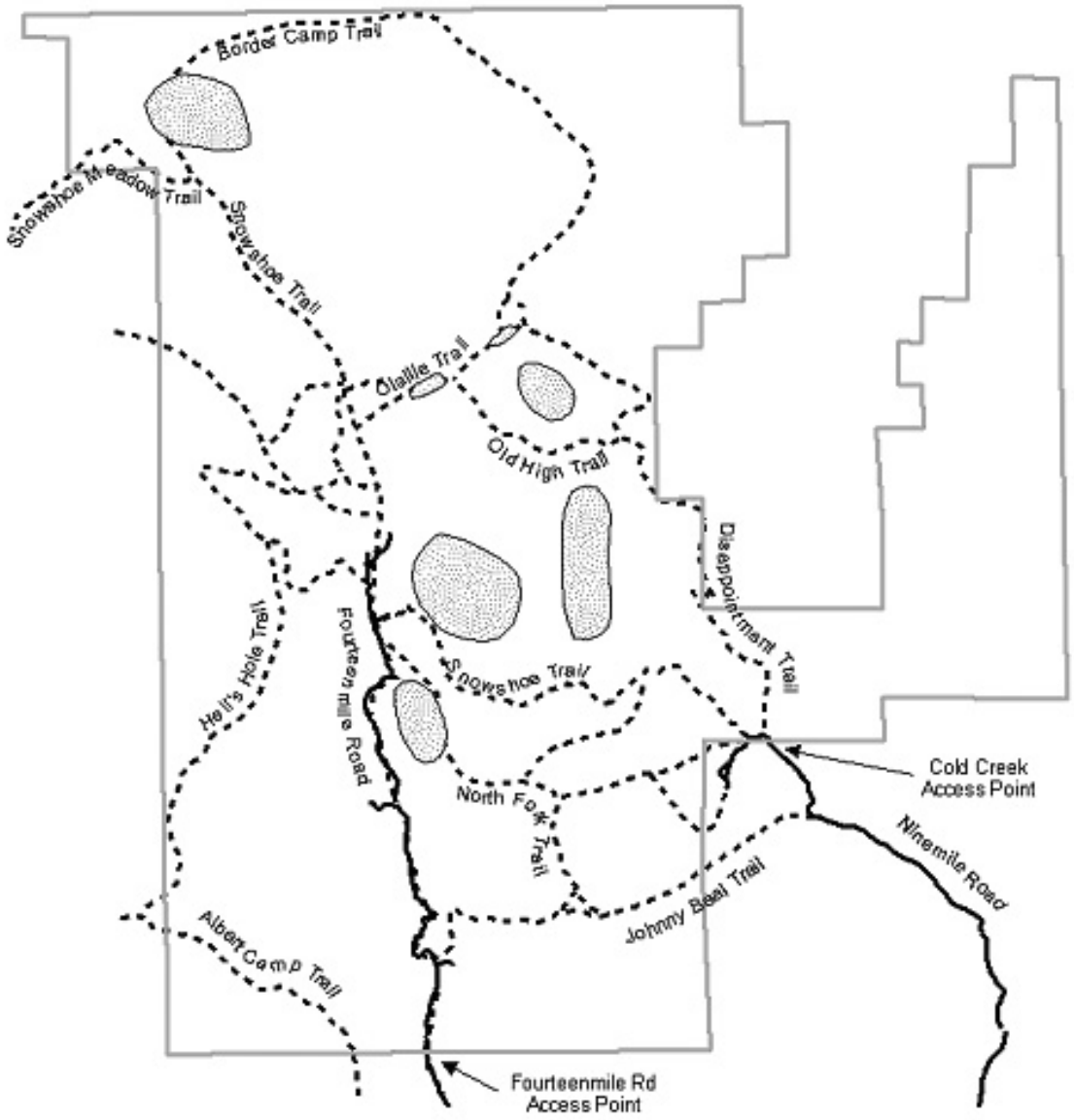
Alpine/Subalpine Meadows
Wetlands and Wet Meadows
Riparian Areas
Shrub-steppe/Grassland
Rock/Talus
Quaking Aspen

Loomis NRCA Management Plan

April 2003

Disturbed Areas - North Block

FOR RESURCE PROTECTION, NOT FOR GENERAL USE.



Legend

Trails — Roads

Snowmobile Play Area

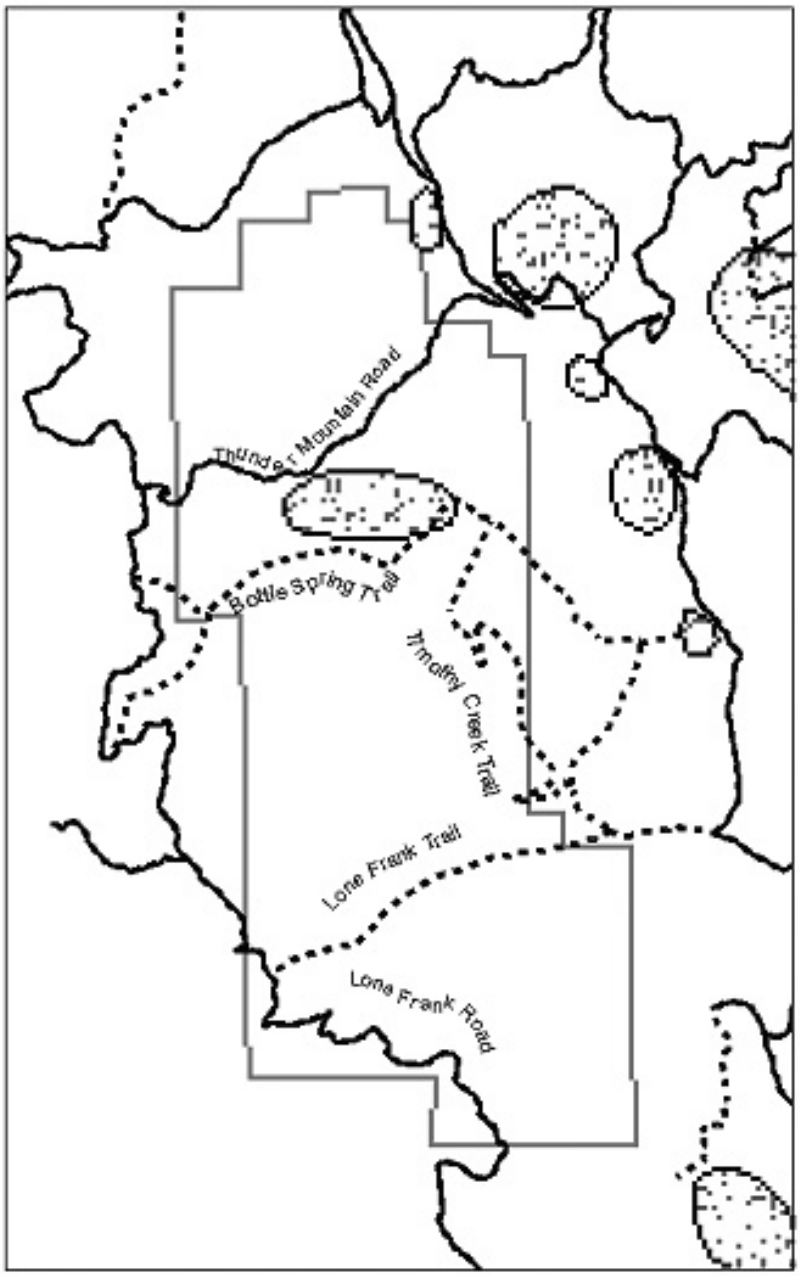
Loomis NRCA

Loomis NRCA Management Plan
April 2003

Motorized wheeled vehicle access is limited to emergency and maintenance vehicles.

Disturbed Areas - South Block

FOR RESOURCE PROTECTION, NOT FOR GENERAL USE



Legend

- Trails
- Roads
- Snowmobile Play Area
- Loomis NRCA

Motorized wheeled access is limited to roads.

Loomis NRCA Management Plan

April 2003

Appendix B: Fuels and Fire Regimes

Fire regimes are characterized by frequency and intensity (see Agee, 1993). A frequent fire regime is generally characterized be by fires occurring every 1-25 years, 25-75 years for moderate frequency and 75 – 300 years for infrequent occurrences. High intensity fires are described as stand replacement fires, burn very hot and consume heavy fuel loads. Low intensity fires burn at lower temperatures than high intensity fires and consume less fuel.

Fuel loads vary from site to site and among plant communities. Fuel models 1,3,6,8, 9, 10, 11 & 12 (Anderson, 1982) are the most likely scenarios to describe fire behavior in the Loomis Conservation Areas. The fuel models are described below in association with vegetation communities.

Primary Fuels (Subalpine Fir Zone)

Subalpine fir-zone forest covers most of the NRCA and is found on all aspects at approximately 5,000 feet and higher. Within the Loomis NRCA, the Subalpine Fir Zone has three types of forests, distinguished by moisture – wet, mesic, and dry. These forest types typically burn infrequently and with high intensity. Mean fire return intervals are approximately 70-300 years. Fires are either stand-replacement events, or partial-mortality events that thin the canopy considerably.

Subalpine Fir Zone – dry (Lodgepole pine)

Fire Regime: Infrequent/High Intensity

Fuel Model: 8

Forest canopies in the Subalpine Fir Zone are dominated primarily by lodgepole pine and secondarily by Engelmann spruce. Forests are characterized by a relatively dense single-layer tree canopy and a subcanopy in varying stages of development created by fire events, mountain beetle attacks and pathogens. Stand structure consists of trees which survived a fire event and potentially, a broad spread of understory regeneration. Trees are relatively small and stands are dense. The understories are dominated by short shrubs. Many relatively small snags and logs are typical of mature to old stands.

Ground fires in Fuel Model 8 burn slowly with low flame heights and occasional high fuel concentrations may cause a flare up. A typical fire would burn in the understory consuming fuels slowly. This type of fire may be easier to contain but usually requires extensive time to extinguish. Only under severe weather conditions do these fuels pose a problem.

Subalpine Fir Zone – mesic (Subalpine fir and Lodgepole pine)

Fire Regime: Infrequent/High Intensity

Fuel Model: 8

The majority of this forest type is in the Southern parcel. The dominant species are Lodgepole pine and Subalpine fir. Forests in this vegetation zone generally consist of a single main canopy layer, however, stands of multiple ages are also common. Varying development of sub-canopy/regeneration layers depends on the disturbance interval and the initial stocking pattern. Some stands may have scattered upper canopy layer of larger trees over the dense main layer. The stand structure is variable and may be even-aged, all aged, or mixed age. Shrub understory can be dense in early stages of succession and may become relatively sparse in middle stages of succession because of canopy shading. Grasses and forbs are generally less abundant than shrubs. Woody fuels accumulate on the ground.

Fuel Model 8 is described above.

Subalpine Fir Zone – wet (Engelmann spruce)

Fire Regime: Infrequent/High Intensity

Fuel Model: 10

Patches of this forest type are found on north slopes, along streams, and in other wet areas. Tree species include Engelmann spruce, lodgepole pine and subalpine fir. The site characteristics create a longer fire interval because moist fuels are less likely to burn. The infrequent fire interval leads to large trees and a large load of woody material available for consumption.

Fires classified in Fuel Model 10 typically occur under the forest characteristics described above. Fuel Model 10 fires burn in the surface and ground fuels with greater fire intensity than other timber litter models due to the large load of dead material on the forest floor. The vertical fuel component is also greater with large trees and snags, which increases the potential for crowning, spotting and torching of individual trees. Thus, fuel model 10 has more situations that lead to potentially difficult fires to control. These fires are usually difficult to contain and extinguish. Spot fires are of special concern in this fuel type.

E. Secondary Fuels

The following fuel types are scattered throughout the NRCA. Most likely the sub-alpine fuel models will predominate, however, these smaller areas, which can be several hundred acres in size, add to the complexity of predicting the behavior of fire in the NRCA.

Douglas Fir Zone

Fire Regime: Infrequent/Moderate-High Intensity

Fuel Model: 8

A small percentage of the vegetation within the Loomis NRCA falls within the Douglas Fir Zone. The forests in this zone are characterized by a semi-open, but relatively continuous, tree canopy. Understory is dominated by shrubs and/or grasses, and may be limited by dense tree growth.

The historical fire regime was characterized by a mixture of frequent, low-severity fire and less frequent, moderate to high severity fire (primarily low-severity fire regimes). Typical pre-settlement fire return intervals were approximately 10-50 years on average. Fire suppression, combined with some management practices, has resulted in dense young canopy layers and ladder fuels, which in turn have increased the probability of stand-replacement high-severity fires and insect/disease outbreaks.

Ground fires in Fuel Model 8 burn slowly with low flame heights and occasional jack pots of fuel concentrations may cause a flare up. A typical fire would burn in the understory consuming fuels slowly. This type of fire may be easier to contain but usually requires extensive time to extinguish. Only under severe weather conditions do these fuels pose a problem

Quaking Aspen

Fire Regime: Infrequent/Low or High Intensity

Fuel Model: 9

Upland aspen stands generally occur in small patches of <5 acres on south or southeast slopes. Stands are usually adjacent to shrub steppe and/or subalpine fir-zone forest. Quaking aspen is generally the only tree present, with occasionally scattered conifers. Understories vary from shrub to grass and forb-dominated vegetation.

Fires run though the surface litter. Rates of spread are variable because of rolling debris and burning materials are easily blown ahead of the main flame front by the wind. Concentrations of woody material will contribute to possible torching out of trees, spotting, and crowning.

Wetlands

Fire Regime: Infrequent/ Low Intensity

Fuel Model: 1 & 3

Various wetland types occur throughout the Loomis NRCA primarily along or at the head of stream courses or in depressions on hillsides. Elevations vary. Vegetation associated with the wetlands includes grassy herbaceous meadows, shrubs, forbs, and various sedges. Some wetland areas have substantial conifer tree cover.

Fuel Model 1 fires are surface fires that typically move rapidly through the cured grasses and associated material. This fuel model applies to shrub-steppe plant communities with little to no shrub cover.

Fuel model 3 fires are the most intense of the grass group and can have high rates of spread when wind driven. Fire will carry over the top of water. Wood concentrations will have a tendency to cause torching.

Shrub Steppe

Fire Regime: Moderate Frequency/Low Intensity

Fuel Model: 1 & 6

Shrub-steppe vegetation (including dry meadows) is found in 200-300 acre patches at relatively high elevations (5,000-7,000 feet), generally on dry, south-facing slopes. It consists of non-forested areas dominated by bunchgrasses and shrubs, and is mainly devoid of trees. Perennial grasses and forbs generally make up the majority of vegetative cover. Shrubs, primarily mountain big sagebrush, may be absent, widely scattered, or form a dense stand. Some of the areas classified as shrub-steppe do not currently have shrub cover and are actually dry grassy meadows. Occasional trees may be widely scattered. Riparian areas often have dense cover grasses, sedges, tall shrubs and trees.

Fuel Model 1 fires are surface fires that typically move rapidly through the cured grasses and associated material. This fuel model applies to shrub-steppe plant communities with little to no shrub cover.

Fuel Model 6 fires burn along the ground at mid-flame height with moderate winds. Shrubs are older, and not exceeding a height of six feet. This model includes a broad range of covers. It can be expected that a wind driven fire would be very difficult to control and would spread very rapidly. However, this fuel type should burnout quickly and can be extinguished relatively easily.

Alpine (Meadows)

Fire Regime: Infrequently/Low

Fuel Model: 1

In the NRCA, alpine vegetation only occurs above approximately 7,000 feet elevation, on the major peaks including Goodenough, Snowshoe, Disappointment, and in the Chopaka NAP, Joe Mills Mt., Hurley Peak, and Chopaka Mountain. Alpine areas are a mixture of short shrubs, grasses, and forbs. Scattered patches of stunted trees are present in some areas. High elevation trees include alpine larch, white-bark pine, subalpine fir, and Engelmann spruce. Other areas are primarily rock or bare ground with very sparse vegetation and little fuel. Short growing seasons due to the prolonged influence of cold that is often combined with drought create a landscape with light fuel loads and long fire intervals.

Fuel Model 1 fires are surface fires that typically move rapidly through the cured grasses and associated material. This fuel model applies to shrub-steppe plant

communities with little to no shrub cover. In alpine landscapes, fire intensity is low due to frost, snowmelt, short burning periods and higher relative humidity.

Harvested Areas

Fire Regime: Infrequently/High Intensity

Fuel Model: 11 & 12

Several areas in the northern block and to a lesser extent in the southern block, have areas that were harvested in 1988, 89' and 93.

Fuel Model 11 fires are fairly active in the slash and herbaceous material intermixed with the slash. Ground fuels are approximately 1' deep. The spacing of the rather light fuel load, shading from the overstory, or the aging of the fine fuels can contribute to limiting the fire potential. Light partial cuts or thinning operations are considered for this fuel model. Clear-cut operations generally produce more slash than represented here. If "red" needles are present Fuel Model 11 should be used.

Fuel Model 12 includes rapidly spreading fires with high intensities capable of generating firebrands can occur. Ground fuels are approximately 2.3' deep and are dominated by slash. Fire is generally sustained until a fuel break or change in fuels is encountered.

Appendix C: The Northwest Wildland Fire Protection Agreement

This agreement is entered into between the state, provincial, and territorial wildland fire protection agencies' signatory hereto, hereinafter referred to as "members."

For and in consideration of the following terms and conditions, the members agree:

Article I

1.1 The purpose of this agreement is to promote effective prevention, pre-suppression, and control of forest fires in the northwest wildland region of the United States and adjacent areas of Canada (by the members) by providing mutual aid in prevention, pre-suppression, and control of wildland fires and by establishing procedures in operating plans that will facilitate such aid.

Article II

2.1 This agreement shall become effective for those members ratifying it whenever any two or more members, the states of Oregon, Washington, Alaska, Idaho, Montana, the Yukon Territory, the Province of British Columbia or the Province of Alberta have ratified it.

2.2 Any state, province, or territory not mentioned in this article which is contiguous to any member may become a party to this agreement subject to unanimous approval of the members.

Article III

3.1 The role of the members is to determine from time to time such methods, practices, circumstances, and conditions as may be found for enhancing the prevention, pre-suppression, and control of forest fires in the area comprising the members' territory, to coordinate the plans and the work of the appropriate agencies of the appropriate members to each other in fighting wildland fires.

3.2 The members may develop cooperative operating plans for the program covered by this agreement. Operating plans shall include definition of terms, fiscal procedures, personnel contacts, resources available, and standards applicable to the program. Other sections may be added as necessary.

Article IV

4.1 A majority of members shall constitute a quorum for the transaction of its general business. Motions of members present shall be carried by a simple majority, except as stated in Article II. Each member will have one vote on motions brought before them.

Article V

5.1 Whenever a member requests aid from any other members in controlling or preventing wildland fires, the member agrees, to the extent they possibly can, to render all possible aid.

Article VI

6.1 Whenever the forces of any member are aiding another member under this agreement, the employees of such members shall operate under the direction of the officers of the member to whom they are rendering aid and be considered agents of the member they are rendering to and, therefore, have the same privileges and immunities as comparable employees of the member to whom they are rendering aid.

6.2 No member or its officers or employees rendering aid within another state, territory, or province pursuant to this agreement shall be liable on account of any act or omission on the part of such forces while so engaged or on account of maintenance or use of any equipment or supplies in connection therewith to the extent authorized by the laws of the member receiving assistance. The receiving member, to the extent authorized by the laws of the state, territory, or province, agrees to indemnify and save-harmless the assisting member from any such liability.

6.3 Any member rendering outside aid pursuant to this agreement shall be reimbursed by the member receiving such aid for any loss or damage to, or expense incurred in the operation of any equipment and for the cost of all materials, transportation, wages, salaries, and maintenance of personnel and equipment incurred in connection with such request in accordance with the provisions of the previous section. Nothing contained herein shall prevent any assisting member from assuming such loss, damage, expense, or other cost from loaning such equipment or from donating such services to the receiving member without charge or cost.

6.4 For purposes of this agreement, personnel shall be considered employees of each sending member for the payment of compensation to injured employees and death benefits to the representatives of deceased employees injured or killed while rendering aid to another member pursuant to this agreement.

6.5 The members shall formulate procedures for claims and reimbursement under the provisions of this article.

Article VII

7.1 When appropriations for support of this agreement or for the support of common services in executing this agreement are needed, costs will be allocated equally among the members.

7.2 As necessary, members shall keep accurate books of account, showing in full its receipts and disbursements, and the books of account shall be open at any reasonable time to the inspection of representatives of the members.

7.3 The members may accept any and all donations, gifts, and grants of money, equipment, supplies, materials, and services from the federal or any local government or any agency thereof and from any person, firm, or corporation for any of its purposes and functions under this agreement and may receive and use the same subject to the terms, conditions, and regulations governing such donations, gifts, and grants.

Article VIII

8.1 Nothing in this agreement shall be construed to limit or restrict the powers of any member to provide for the prevention, control, and extinguishment of wildland fires or to prohibit the enactment of enforcement of state, territorial, or provincial laws, rules, or regulations intended to aid in such prevention, control, and extinguishment of wildland fires in such state, territory, or province.

8.2 Nothing in this agreement shall be construed to affect any existing or future cooperative agreement between members and/or their respective federal agencies.

Article IX

9.1 The members request the United States Forest Service to act as the coordinating agency of the Northwest Wildland Fire Protection Agreement in cooperation with the appropriate agencies for each member.

9.2 The members will hold an annual meeting to review the terms of this agreement and any applicable operating plans and make necessary modifications.

9.3 Amendments to this agreement can be made by a simple majority vote of the members and will take effect immediately upon passage.

Article X

10.1 This agreement shall continue in force on each member until such member takes action to withdraw therefrom. Such action shall not be effective until sixty (60) days after notice thereof has been sent to all other members.

Article XI

11.1 Nothing in this agreement shall obligate the funds of any member beyond those approved by appropriate legislative action.

Signed by:

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

STATE OF MONTANA
DEPARTMENT OF NATURAL RESOURCES

PROVINCE OF BRITISH COLUMBIA
MINISTRY OF FORESTS

YUKON TERRITORY
FOREST SERVICE

PROVINCE OF ALBERTA
MINISTRY OF LANDS

STATE OF IDAHO
DEPARTMENT OF LANDS

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES

STATE OF OREGON
DEPARTMENT OF FORESTRY

**An original, signed copy is on file with the Department of Natural Resources.