

REGIONAL DISTRICT OF NANAIMO

**COMMITTEE OF THE WHOLE
TUESDAY, JANUARY 12, 2016
7:00 PM**

(RDN Board Chambers)

SEPARATE ENCLOSURE

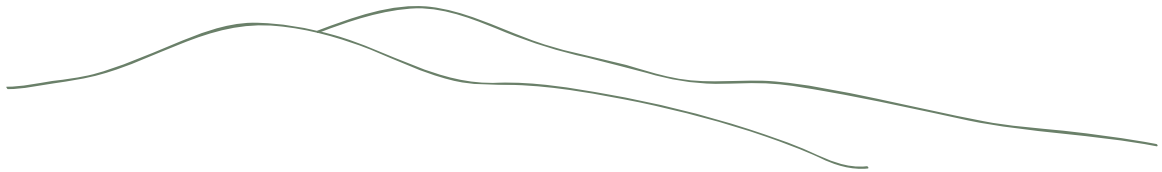
Supplement to report (pages 82-126 on main agenda): Mount Benson Regional Park Conservation Covenant and Termination of Contribution Agreement.

Appendix I Documents:

- | | |
|---------|--|
| 2-91 | Schedule "B"
The Mount Benson Regional Park 2010-2020 Management Plan |
| 92-98 | Schedule "C"
The Baseline Documentation Overview and Report Including Park Map |
| 99-177 | Schedule "C" continued
2. Report
a. Assessment of Conservation Values within Mt. Benson Regional Park, Nanaimo |
| 178-191 | Schedule "C" continued
2. Report
b. Mount Benson Regional Park- Review of Nature Values- Forestry |
| 192-210 | Schedule "C" continued
2. Report
c. Chapter 3 of Mount Benson Regional Park 2010-2020 Management Plan |

Schedule "B"

The Mount Benson Regional Park 2010-2020 Management Plan



Mount Benson Regional Park

2010-2020 Management Plan



DECEMBER 2009

Prepared for:

**Regional District of Nanaimo
Recreation and Parks Dept.**



and

Nanaimo & Area Land Trust



Prepared by:
HB Lanarc Consultants Ltd.



Front cover photos courtesy of S. Shaw and H. Rueggeberg

ACKNOWLEDGEMENTS

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The support, commitment and vision of the members of these committees were central to the success of the project.

Our sub-consultants, *Joe Materi, R.P.Bio.*, Ursus Environmental Consulting and *Len Apedaile, R.P.F.*, Econ Consulting were instrumental in providing the ecological and forestry expertise needed to complete this Plan.

To the many *citizens, organizations and their representatives* who provided invaluable input into the management plan through the park survey, public sessions and comments on this plan – thank you for your insight, time and resources.

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EXECUTIVE SUMMARY

Mount Benson Regional Park, located just west of the City of Nanaimo, covers 212 hectares (523 acres) of land on the upper north east slope of Mt. Benson. It is located in Electoral Area C of the Regional District of Nanaimo (RDN).



The Park is surrounded by private managed forest and Crown land. There are no public roads to the Park, and existing trail accesses cross private and Crown lands. Securing agreements with surrounding landowners and tenure holders is key to long term management and use of the Park.

The Park was acquired jointly by the Regional District of Nanaimo (RDN), the Nanaimo and Area Land Trust Society (NALT) and the Mt Benson Legacy Group. While the Park is now owned by the RDN, management of the Park is conducted in partnership with NALT. Together, the RDN and NALT seek to protect and steward the lands while at the same time provide rewarding and educational outdoor recreational experiences.

This Management Plan guides the operations, development and stewardship of Mount Benson Regional Park based on a comprehensive analysis of values (environmental, natural resource, recreational, cultural, and historical) and public and stakeholder input. The Plan lays out the long-term vision and goals for the Park and identifies management policies and actions for the period 2010-2020. The plan will be reviewed after five years by a management steering committee and updated formally at ten-year intervals.

The process to develop the Plan was overseen by a RDN-NALT Working Group and a Subcommittee composed of members from the RDN's Regional Parks and Trails Advisory Committee and the NALT Board. The plan process included two public surveys, two public information sessions, and contact with a variety of stakeholders.

The Park encompasses a wide range of values. The Plan documents known ecological features and functions based on field studies conducted in 2006- 2007. A rapid assessment of forestry resources was conducted as part of the Plan, and a preliminary overview of reforestation needs provided (Addendum 1). Current trails and recreational uses are also described, as well as mineral, historic, cultural and educational values.

The following *Vision* guides the Management Plan:

Mount Benson Regional Park is and will remain a wilderness park with inherent ecological, recreational and historical values. The Park's natural habitats and sensitive ecosystems will be preserved and enhanced. At the same time, the Park will provide outstanding, ecologically-sensitive recreation opportunities to area residents and visitors. Mount Benson Regional Park is part of the Nanaimo's dramatic mountain backdrop and will remain a natural landmark in the Regional District.



Management of the Park will also be in accordance with the following five *Management Goals*:

Environment: To protect and restore natural habitats found within Mount Benson Regional Park.

Recreation and Education: To provide recreational and educational opportunities that are compatible with the ecological values of Mount Benson Regional Park and its sensitive habitats; and, to take a long-term approach to improving accessibility to the Park and its viewpoints.

Management and Stewardship: To work together with the larger community - including the Snuneymuxw First Nation, educational institutions, community organizations, neighbouring landowners and tenure holders, government agencies, volunteers and the public - in the short-term management and long-term stewardship of the Park.

Visual Integrity: To maintain a natural, green backdrop for area residents and visitors and to ensure that management decisions and actions in Mount Benson Regional Park do not adversely impact the Nanaimo and area's view of the mountain.

Public Safety: To address park safety while respecting the wilderness context of the Park, and to cooperate with neighbouring landowners and managers to minimize natural and human-induced risks within the park and surrounding lands.

The Plan lays out 25 Management Policies organized under 14 topics that address everything from park zones, forestry and mineral resources to trail uses, signage and fire prevention. These policies and their accompanying actions over the next 10 years are explained in chapter 5 and summarized in a table in chapter 6.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

EXECUTIVE SUMMARY

1.0 INTRODUCTION	1
1.1 Park Overview.....	1
1.2 Role of Regional Parks.....	2
1.3 Stakeholders.....	2
1.4 Purpose of the Management Plan	3
1.5 Plan Organization.....	3
2.0 MANAGEMENT PLANNING PROCESS.....	5
2.1 The Approach	5
2.2 Public Consultation	6
3.0 DEFINING THE PARK VALUES	10
3.1 Land Status	10
3.2 Natural Resources.....	14
3.3 Recreation.....	22
3.4 Education	26
3.5 History and Culture.....	26
4.0 VISION, PRINCIPLES AND GOALS	28
4.1 Vision Statement	28
4.2 Management Goals.....	29
4.3 Management Principles	30
5.0 MANAGEMENT POLICIES AND ACTIONS	32
5.1 Balancing Conservation and Recreation	32
5.2 Protecting Environmental Values.....	33
5.3 Forestry Resources	36
5.4 Mineral Resources.....	37
5.5 Park Accesses	38
5.6 Park Accessibility.....	40
5.7 Trails Use and Management	42
5.8 Park Information and Signage	46
5.9 Visitor Facilities	48

5.10 Commercial Facilities and Activities 50
 5.11 Education and interpretation 51
 5.12 Park Stewardship and Operations 53
 5.13 Fire Safety and Emergency Planning 55
 5.14 Future Acquisitions 57

6.0 SUMMARY OF POLICIES AND ACTIONS..... 59

7.0 SOURCES 67

ADDENDUM 1: Review of Natural Values – Forestry: a rapid field
 assessment of Mt Benson Regional Park

Appendix A: Stakeholder Consultation List

Appendix B: Public Session #1 Results

Appendix C: Park Survey Results (Summary)

Appendix D: Public Session #2 Results

Appendix E: Draft Plan Survey Results (Summary)

Figure 1: The planning process5
Figure 2: Mount Benson Regional Park and surrounding lands.....10
Figure 3: Mount Benson Regional Park and neighbouring properties11
Figure 4: Sensitive Ecosystem polygons identified in the Park16
Figure 5: Top Tourism Attractions for visitors to Central Vancouver Island22
Figure 6: Existing trails in Mount Benson Regional Park24
Figure 7: Park Management Site Plan.....34

*Table 1: Valued Ecosystem Components identified in the Park (Ursus
 Environmental, 2006).....18*

1.0 INTRODUCTION

1.1 PARK OVERVIEW

Mount Benson Regional Park, located just west of the City of Nanaimo, covers 212 hectares (523 acres) of land on the upper north east slope of Mt. Benson. It is located in Electoral Area C of the Regional District of Nanaimo (RDN).



Mt Benson from Nanaimo Harbour

Past logging activities (1800s to present) and major fires (early 1920s and 1951) have shaped the forested slopes of Mount Benson. The Park itself is surrounded by private managed forest along with Crown land managed under a Woodlot License. In 2003 and 2004, about 64 hectares of the eastern portion of the Park property was logged by the previous owner, leaving several clear cut areas and a network of logging roads.

The mountain provides stunning views from the peak and upper elevations to Nanaimo, the Strait of Georgia and Mainland on the north and east, with a mountain panorama into the central Vancouver Island highland mountains to the south and west.

In 2004, in response to public concerns over new logging on private property on the upper slopes of the mountain, the Coalition to Save Mt Benson was formed by a group of local outdoor organizations, businesses and concerned residents. On behalf of the Coalition, NALT initiated negotiations with the property owners and in 2005, in partnership with the RDN, finalized a deal that saw the RDN take ownership of the property with the RDN and NALT each contributing 50% of the purchase price. Once all the funds were raised, the Park was officially opened in July 2008 (see Box 1. “A Short History of Park Acquisition” on page 4 for further details).

Mount Benson is a well-known landmark and outdoor recreational playground for area residents and visitors alike. However, it is important to recognize that Mount Benson Regional Park represents only a portion of the whole mountain. There are numerous trails, climbing crags and other points of interest that fall outside of the Regional Park boundary and hence, outside of the jurisdiction of the RDN and this Management Plan.

1.2 ROLE OF REGIONAL PARKS

The RDN manages approximately 2026 hectares of regional park, trail and conservation lands in the mid-Vancouver Island area along with another 584 hectares of neighbourhood or community parks and trails.

A Regional Parks and Trails Plan, completed in 2005, sets out the goals of the RDN with respect to land management, stewardship and recreational use of regionally significant properties.

The 2005 Regional Parks and Trails Plan establishes a vision for Regional Parks that *“secures, protects and stewards lands and water features of environmental significance and wildlife habitat value.”*

When managing properties, the RDN often acts in partnership with other government agencies and conservation organizations to manage the Parks. This is the case with Mount Benson Regional Park, where the acquisition and now management of the Park are conducted in partnership with the Nanaimo & Area Land Trust Society (NALT). Together, the RDN and NALT seek to protect and steward the lands while at the same time provide rewarding and educational outdoor recreational experiences.

1.3 STAKEHOLDERS

A variety of agencies and organizations have an interest in the use and management of Mount Benson Regional Park including:

Management Partners, Landowners	Regional District of Nanaimo Nanaimo & Area Land Trust
Neighbouring landowners and tenure holders	Island Timberlands Ltd. TimberWest Forest Corp. Cercomm Electronics Ltd. Province of BC City of Nanaimo Benson View Road residents Vancouver Island University
Aboriginal Heritage	Snuneymuxw First Nations

Education, Tourism	Vancouver Island University School Districts 68 & 69 Tourism Nanaimo Greater Nanaimo Chamber of Commerce
Emergency Services	Coastal Fire Centre, Mid-Island Fire Zone East Wellington Volunteer Fire Department RCMP Nanaimo Search and Rescue
Community Interests	Outdoor recreation organizations Area residents and visitors Local businesses

1.4 PURPOSE OF THE MANAGEMENT PLAN

This Management Plan guides the operations, development and stewardship of Mount Benson Regional Park based on a comprehensive analysis of values (environmental, natural resource, recreational, cultural, and historical) and public and stakeholder input.

The Plan lays out the long-term vision and goals for the Park and identifies management policies and actions for the period 2010-2020.

The plan will be reviewed after five years (2015) by a management steering committee and updated formally at ten-year intervals.

1.5 PLAN ORGANIZATION

This management plan includes the following sections:

- **Management Planning Process:** Summarizes the methods used to create this Plan and the results of the consultation process.
- **Defining the Park Values:** Provides an overview of land status and existing natural, recreational, resource, educational and cultural values of Mount Benson Regional Park.
- **Vision, Principles and Goals:** Defines the vision and management goals developed through the management plan process and outlines key principles that affect park operations.

- **Management Policies and Actions:** Addresses identified park management issues and identifies solutions through management policies and actions.
- **Summary of Policies and Actions:** Lists the policies and actions recommended for the 10-year management term.

A Short History of Park Acquisition

1994 – The property is sold by TimberWest Forest Corp. to Pennclan-Reeve Company Ltd.

1995 – Mount Benson is identified as a significant site in the RDN Park System Plan. Pennclan submits a rezoning application for the property to the RDN for 54 five acre lots with approximately 20% of the property as parkland. The planning report prepared by RDN staff does not support the rezoning and the application is withdrawn in February 1996.

1999 – The property is listed for \$1.2 million. The realtor approaches the City of Nanaimo and the RDN but lack of funds and other factors prohibits purchase of the land for park. The property does not sell and is withdrawn from the market.

2003-2004 – Pennclan starts logging on the east side of the property. An article in the Nanaimo Daily News advises the public that hiking to the summit of Mount Benson may be seen as trespass by the landowners. These events prompt a letter writing campaign to protect Mount Benson as a public park and the formation of the Coalition to Save Mt Benson. On behalf of the Coalition, NALT contacts Pennclan to determine their interest in selling the property. *The Coalition establishes a campaign to* fundraise and garner community support for acquisition of the property as parkland. The RDN and NALT cost-share a property appraisal and a timber assessment.

2005 – The Coalition succeeds in stopping further logging by Pennclan while they are negotiating possible purchase. Pennclan offers the property for \$950,000 with a closing date of December 21st, 2005. The RDN completes its Regional Parks and Trails Plan 2005-2015 which includes Mount Benson on its priority acquisition list. At the Coalition's request, the RDN Board agrees to purchase the property and completes the purchase contract with Pennclan.

Feb 2006 – A contribution agreement is signed between NALT (as the legal representative of the Coalition) and the RDN in which each party agrees to provide 50% of the purchase price and giving NALT two years to raise its 50%. NALT and the Coalition, now called the Mt Benson Legacy Group, step up their fundraising campaign. RDN passes two bylaws to secure interim financing for the full purchase.

March 15, 2006 – The land purchase is closed and the RDN becomes the registered land owner.

February 2007 – RDN board receives the first installment of 25% of the purchase price from NALT and the Mt Benson Legacy Group.

February 2008 – NALT secures a line of credit to make the second installment of 25% on schedule; fundraising continues to pay down the line of credit.

July 2008 – With a final \$50,000 grant from Mountain Equipment Coop, NALT and the Legacy Group reach their goal.

2.0 MANAGEMENT PLANNING PROCESS

2.1 THE APPROACH

HB Lanarc Consultants Ltd. was awarded the contract to lead the planning process and write this Management Plan. The consulting team was supervised by a Staff Working Group consisting of representatives from the RDN Recreation and Parks Department and NALT. A Management Plan Sub-Committee was also struck consisting of members from the RDN Board and NALT's Board of Directors to provide general oversight and review.

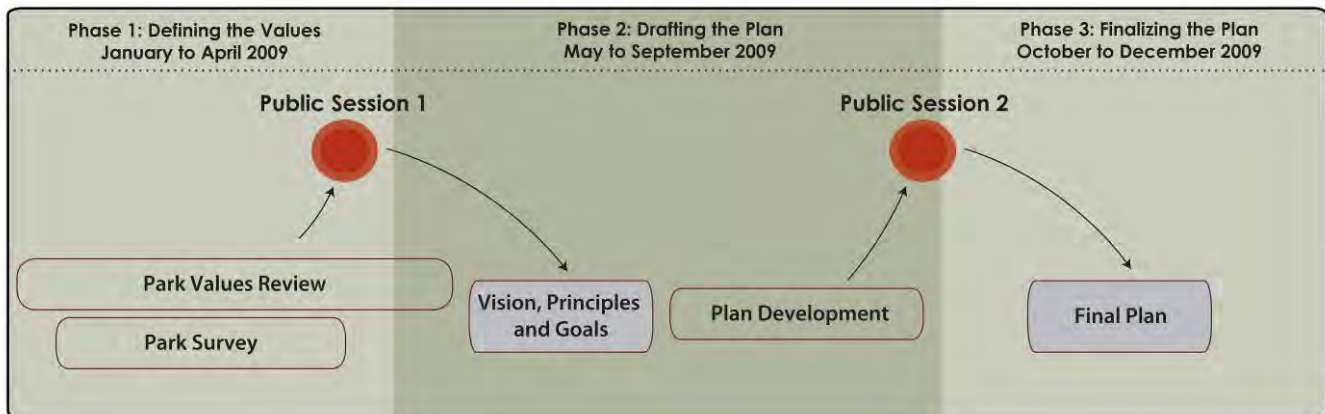


Figure 1: The planning process

The plan was developed in three phases:

1. Defining the Values:

Relevant baseline information was compiled, reviewed and synthesized, including property information, maps and inventories, historical records, legal documents and other related reports and plans.

Base maps were generated.

Consultants visited and analyzed the Park during site visits.

Initial meetings were held with the Staff Working Group and Management Plan Sub-Committee.

A public survey was disseminated and a public information session held to present the information that was gathered, seek further information and get public views on the future of the Park.

A 'rapid field assessment' of forestry values and reforestation strategies was also conducted.

2. Identifying Vision and Goals and drafting the Plan:

From the public input, a preliminary Vision and set of Management Goals and Principles were developed.

Vision, Goals and Principles were reviewed and refined with the Staff Working Group and Management Plan Sub-Committee. These efforts provided the basis for drafting the Plan itself.

A preliminary draft of the management plan was developed and reviewed by the Staff Working Group and Management Plan Sub-Committee.

Revisions were made, a Draft Plan was disseminated to stakeholders and the public, and a second Information Session held to present the Draft and gather comments.

3. Reviewing and Finalizing the Plan:

Based on public and stakeholder feedback, the plan was revised and finalized with the assistance of the Staff Working Group and Management Plan Subcommittee.

The plan was submitted to the RDN Board for approval in early 2010.

2.2 PUBLIC CONSULTATION

Public consultation in developing this plan included:

- direct contact via email, and in some cases telephone or personal meetings, with a range of stakeholders – people and organizations with an active interest in the Park.
- a public survey and a public session to gather information on use and opinions about the future of the Park (phase 1).
- a second public session to present the draft plan and gain feedback (phase 2).

- ongoing information on the process and its results, and dissemination of the Draft and Final Plan on the RDN's and NALT's websites.

2.2.1 Stakeholder Consultation

A variety of organizations, agencies and individuals were contacted regarding their interest in Mount Benson Regional Park (see *Appendix A: Stakeholder Consultation List*). Initial contact was made in March 2009 to inform stakeholders about the management plan process, provide information about the first public session and distribute the user survey. Subsequent contact was made in September-October 2009 to request input on the draft management plan.

2.2.2 Public Session #1

Approximately 100 people attended the first Public Session held on April 16th, 2009 at Beban Park in Nanaimo. This session used an open house format designed to present background information and gather information and ideas from the public. A series of posters asked questions such as:

- What are key words that you feel best describe your vision for the future of the Park?
- What are the top three issues that you feel are priorities for the management plan?
- What images reflect the future character that you would like to see for the Park?

The consultants also gave a short presentation at two points during the open house on the plan process and preliminary issues and opportunities. Public session participants were given the floor during Question and Answer sessions.

What We Heard

Results from the public session are summarized in *Appendix B: Public Session #1 Results*. Key outcomes included:

- Strong emphasis on both environmental protection and recreational opportunities.
- Notable issues included trail use conflicts, park access, trail conditions, litter and vandalism and parking.

Public Session #1

April 16th, 2009

Beban Park Lounge,
Nanaimo 4pm – 8pm

Attendees: +100

- Desirable park character tended towards natural, rustic images.
- Strong voice from the public requesting easier accessibility into the Park.

2.2.3 Park Survey

A Mount Benson Regional Park survey was available from April to May 2009 online from the RDN's website, at the RDN and NALT offices, and at various local events to receive public input on the future of the Park. A total of 373 survey responses were received.

Park Survey

April 15–June 30, 2009

Respondents: 373

What We Heard

The compiled survey results can be found in *Appendix C: Park Survey Results*. Key results of the survey include:

- Strong interest for environmental protection and 'keeping it natural.'
- Emphasis on maintaining multi-use nature of park – input from hikers, mountain bikers, climbers, paragliders and motorized users among others.
- Request for improved access – including formalization and better design of trails as well as interest development of a vehicle road or gondola access that would allow people of all levels of physical ability to access the Park.
- Need for improved visitor safety (e.g. better directional signage, posting emergency contacts).

Further details on input received from the first public session and the Park survey can be found in Section 5, as part of the discussion of park issues and policies. A detailed compilation of the Survey Results is also available on request.

Public Session #2

October 29th, 2009

Beban Park Lounge,
Nanaimo 4pm – 8pm

Attendees: ≈ 50

2.2.4 Public Session #2

Approximately 50 people attended the second Public Session held on October 29th, 2009 at Beban Park in Nanaimo. Like the first session, an open house format was used to present the draft Management Plan and obtain feedback from the public. A series of posters presented and asked for comments on the Vision, Management Goals and main Policies of the draft Plan.

The consultants also gave a short presentation at two points during the open house on the draft Plan, and outlined the process for completing and adopting the final Plan. Public session participants were given the floor during Question and Answer sessions.

What We Heard

Results from the public session are summarized in *Appendix D: Public Session #2 Results*. Most comments focused on alternative means to access the Park, continued non-motorized use only, parking, trails and signage.

2.2.5 Draft Plan Survey

The draft Plan was also posted on the RDN's website for review along with a survey form asking whether reviewers agreed or disagreed with the various components of the draft Plan.

What We Heard

Results from the Draft Plan Review are summarized in *Appendix E: Draft Plan Survey Results Summary*. A detailed compilation of the survey results are available from the RDN on request.

Most respondents (85% or greater on each question) agreed with the proposed Vision, Management Goals and most of the proposed Policies. The greatest level of disagreement and commentary centered around Policy #7 regarding increasing accessibility to the Park. Comments were split on providing a road to the summit in the future, while most respondents were not in favour of considering a gondola.

Draft Plan Survey

Oct 15–Nov 6, 2009

Respondents: 58

3.0 DEFINING THE PARK VALUES

3.1 LAND STATUS

The 212 hectares (523 acres) that comprise Mount Benson Regional Park occupy the upper north face of Mount Benson, lying between the 457 m (1,500 foot) and 1,006 m (3,300 foot) elevations. The Park is made up of three separate parcels legally described as Block 787, Block 1161 and Section 7, Range 4 within the Mountain Land District. The Park does not include the twin summits of the mountain (Figure 2).

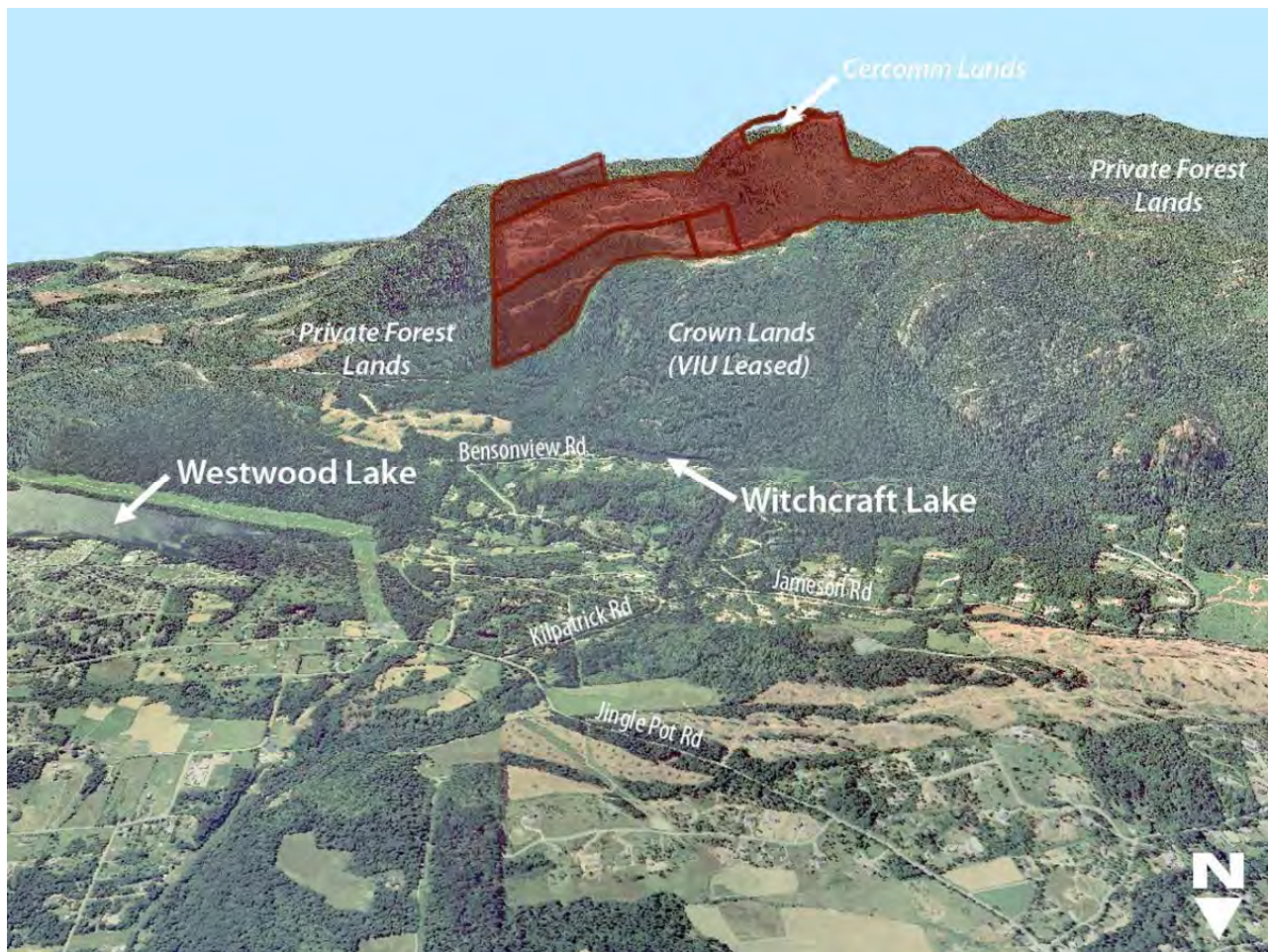


Figure 2: Mount Benson Regional Park (red) and surrounding lands

3.1.1 Neighbouring Lands

The Park is surrounded by private managed forest owned by Island Timberlands Ltd and TimberWest Forest Corp. to the east, west and south; and by BC Crown land to the north tenured to Vancouver Island University under Woodlot License #W0020 (Figure 3).

The mountain has two summits neither of which are contained in the Park. The west summit is a small (1.24ha/ 3.06 acre) parcel of Provincial Crown land which originally housed a fire tower. The east summit is encompassed in a 4.8 hectare (12 acre) parcel owned

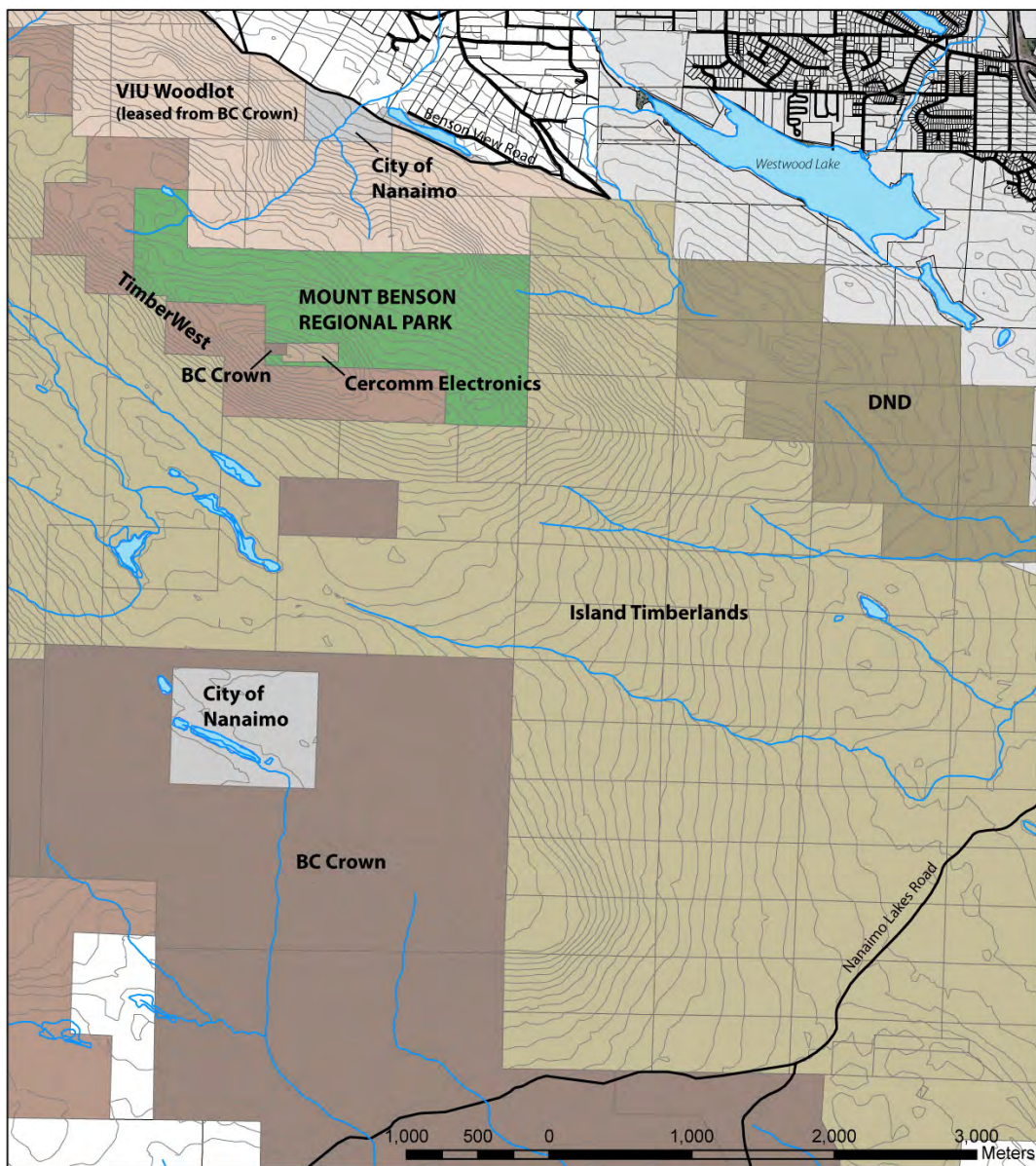


Figure 3: Mount Benson Regional Park and neighbouring properties

by Cercomm Electronics Ltd., which operates several transmission antennas and a diesel generation facility on site.

The City of Nanaimo holds park lands at Westwood Lake and Witchcraft Lake, both popular points of access to the mountain.

3.1.2 Leases and Encumbrances

Cercomm Electronics holds an *easement* over the Park lands that grants Cercomm the right to construct, install and maintain an access road and poles, wires, conduit and other apparatus for the supply of electrical power. In doing so, Cercomm is obliged to use reasonable efforts to minimize the footprint of such construction within the Park. Once permanent elements are constructed, the easement will be modified to include only the built areas.

A *Contribution Agreement* between the RDN and NALT was signed in 2005. Through this agreement, NALT and the RDN each contributed 50% of the property cost and committed to work together in the preparation of the Park Management Plan and to ensure a significant role for NALT and/or the Mount Benson Legacy Group in park stewardship and future management including trail development and restoration of logged areas.

A *Conservation Covenant* will be placed over the lands once this Management Plan is approved and adopted. The terms of the covenant will reflect the RDN's Regional Park goals and policies and the specific management directions defined through this management plan, while protecting NALT's interests in future stewardship of the Park. NALT will take the lead role as one of two Land Trust organizations holding the covenant and will be responsible for annual monitoring.

3.1.3 Land Use Regulations

Mount Benson Regional Park lies within Electoral Area 'C' and is designated in the *Arrowsmith Benson-Cranberry Bright Official Community Plan* (OCP) as Resource lands. The resource land designation applies to lands used for forestry, resource extraction, agricultural production or environmental conservation. The objectives of this designation include supporting and maintaining the long-term viability of the natural resource value and to protect it from activities and land uses which may diminish its resource value or potential (RDN Bylaw No. 1148). Within this land

designation, outdoor recreation and ancillary facilities exclusively devoted to outdoor recreation are listed as permitted uses.

Objectives of the OCP relevant to Mount Benson Regional Park include:

- To preserve, protect and enhance the area's natural resources which include not only aquatic and terrestrial wildlife and plants, but also freshwater, agricultural, forest, and mineral resources;
- To preserve and protect environmentally sensitive ecosystems and the nesting trees of protected species.

The *RDN Regional Parks and Trails Plan 2005-2015* sets out the future direction, policies, priorities and actions for regional parks and trails. The vision outlined in this plan is for a system that protects and stewards natural values while providing rewarding recreational opportunities; fostering education and appreciation of the natural environment; and, enhancing the livability of the Region.

RDN Park Use Regulations Bylaw No. 1399 (2004) regulates park use in community and regional parks. This bylaw limits park use to non-motorized activities (walking, cycling and horseback riding). Mount Benson Regional Park is listed as a Level 4 Park – “Undeveloped Park, Trail and other Open Space.” Park Use Permits are issued under this bylaw for such activities as commercial recreation services, special events and research activity.

3.1.4 Utility and Road Services

There are no utilities to the Park. The closest hydro and telephone service is about 6.4 km away on the private logging road system to the east of the Park. Cercomm Electronics currently powers their antennas at the east summit using on-site diesel generators. As noted, Cercomm may construct a power line to their facility over Park land. However, as this Management Plan was being developed, Cercomm was assessing whether their power needs could be met by using small on-site windmills.

There are no public roads to the Park. Two private logging road networks lead from Nanaimo Lakes Road to the east and south boundaries of the Park. Portions of these roads are maintained by the respective forest companies depending on logging activity.

They are not publicly accessible and are gated and locked near their entrances. Access to the Park along these roads can be obtained for maintenance and emergency purposes.

The Island Timberlands road to the east boundary was extended by the previous owner into the property to facilitate the 2003-2004 logging. However, the roads within the Park have since been decommissioned and are very rough, accessible only by a 4x4 vehicle with good clearance.

The logging road accesses from Nanaimo Lakes Road were not included as a choice for how people access the Park in the survey. However, numerous people commented that this was the route they use to access the slopes of Mount Benson and the Park. Long time residents remember when their families could drive to the summit via the old fire tower road (1950-60s).

The private forestry companies have indicated that they are not interested in permitting public access on their roads from Nanaimo Lakes Road at this time, due to concerns of increased dumping, vandalism and fire arson. They did indicate that they would continue to allow emergency and servicing access to the Park boundary by authorized personnel.

3.1.5 Fire and Emergency Service

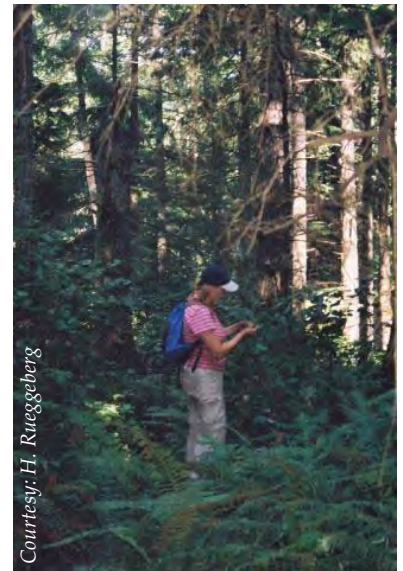
The RDN has a cost-sharing agreement with the Province's Coastal Fire Centre for fire response in the Park. The Coastal Fire Centre, located in Parksville, is the fire dispatch and operational centre for wild land fire fighting in South Coastal BC and supports 12 fire bases throughout the region. The Mid-Island Fire Zone provides service for the Park. Costs for this service are generally based on risk and fire-start potential.

Other emergency services are provided by the RCMP and by Nanaimo Search and Rescue, a registered non-profit society.

3.2 NATURAL RESOURCES

3.2.1 Environmental Features and Systems

In 2006, Ursus Environmental prepared an *Assessment of Conservation Values within Mount Benson Regional Park* for NALT. This project consolidated existing environmental and resource data



Typical 2nd growth forest in Park

related to the Park property, conducted a ground verification of sensitive ecosystems identified by previous inventories, and assessed the site's overall conservation values using standardized methods. This section is based in large part on this Assessment and further verification by Ursus Environmental.

Biogeoclimatic Zones

Mount Benson Regional Park encompasses two variants of the Coastal Western Hemlock (CWH) biogeoclimatic zone, including the Very Dry Maritime Coastal Variant (CWHHxm2) below 700m elevation and the Montane Moist Maritime Variant (CWHmm2) from 700m elevation to the summit. Differences between these two variants are related to elevation differences, with cooler temperatures and more snowpack in the higher reaches of the mountain. According to Pojar (1991), the CWH zone has the greatest diversity and abundance of habitat elements of all biogeoclimatic zones in the province.



Wetland at northwest end of Park

Hydrology

The summit of Mount Benson is the highest point of the Millstone River watershed and is the source of McGarrigle, McNeil and Benson Creeks that flow down its north slopes to Witchcraft Lake, Westwood Lake and the Millstone River. The east slope drains into the Chase River system. Mount Benson Regional Park forms the headwaters for these watercourses.

Wildlife Corridors

These aquatic systems form the basis for a network of wildlife corridors on the mountain and its surrounding areas. Several large species are known to use or travel through the region, including cougars, black bears and Columbian black tailed deer. In addition, a variety of small mammals and avifauna have been recorded in or near the study area (Ursus Environmental, 2006).

Sensitive Ecosystems

The *Sensitive Ecosystems Inventory for Southeastern Vancouver Island* (the SEI), published by federal and provincial environmental agencies in 1997, identified a variety of sensitive ecosystems on Mount Benson from aerial photography analysis. Fourteen SEI polygons were identified in the lands now comprising the Park.

Some of these polygons were subsequently field evaluated and updated by students from VIU in 2003-2004.

Ursus Environmental's assessment in 2006 confirmed the presence of eight of the SEI polygons, two of which had revised ecosystem associations. Four other SEI polygons were found to be significantly degraded by logging activity and two others remained unconfirmed due to accessibility constraints. Ursus also identified 9 new sites that meet SEI criteria. Figure 4 shows the location of known SEI polygons in and around the Park; there are likely more SEI sites that have not yet been identified.

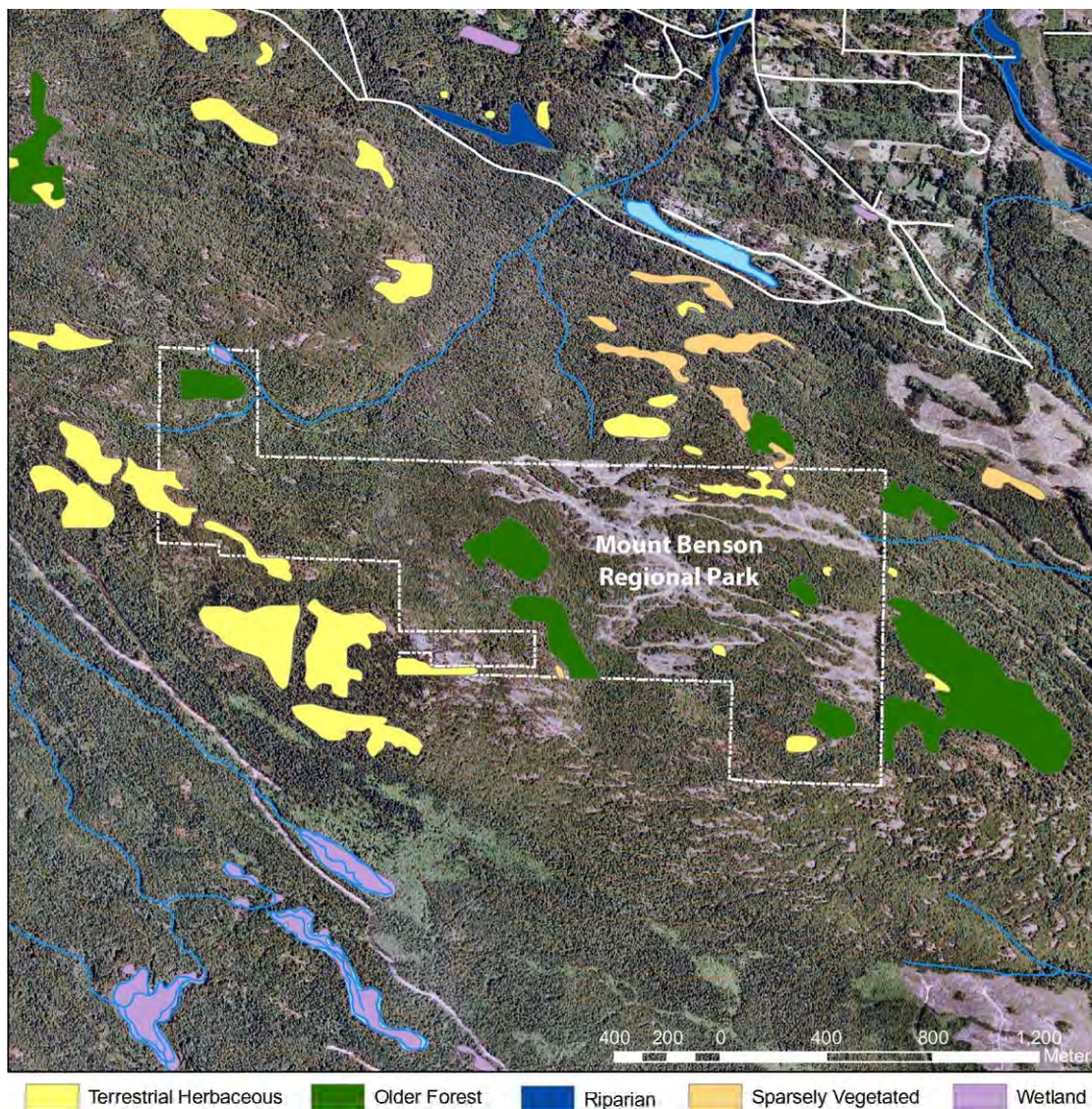


Figure 4: Sensitive Ecosystem polygons identified in the Park (from Ursus Environmental, 2006)

Other Ecological Features

Ursus Environmental's 2006 assessment highlighted the following additional ecological features:

Fungi – No formal inventory has been conducted although casual observations over nearly two decades indicate a rich fungi assemblage within the Park.

Avifauna – More than 75 bird species have been recorded in or near the Park. 52 of these are known to breed locally while the remainder likely over-winter in the area. Two identified species-at-risk are known to breed locally including the Northern Goshawk (red-listed) and the Western Screech-owl (blue-listed).

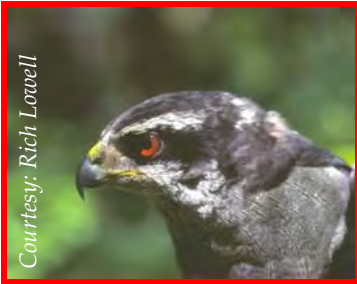
Mammals – Columbian black-tailed deer are common in the region. Evidence of cougar, elk and black bear has been found in the Park. In addition, scat belonging to marten, a highly arboreal member of the weasel family, has been seen in the Park.

Amphibians and Reptiles – Three species of native amphibians have been documented within the Park, including the northwestern salamander, western toads and pacific tree frogs. No reptile observations have been noted from previous field sessions. However, the Park falls within the distributional range of four species of native reptiles including common and western terrestrial garter snake, northwestern garter snake and the northern alligator lizard.

Conservation Assessment

A widely recognized approach to assessing conservation value is to identify Valued Ecosystem Components (VECs) and rate the site's importance to them. VECs are defined as "any part of the environment that is considered important by the proponent, public, scientists and government involved in the assessment process. Importance may be determined on the basis of cultural values or scientific concern" (Canadian Environmental Assessment Agency). Typical VECs include species diversity, presence of rare/endangered species or communities, and habitat connectivity (the ability of species to range through natural habitats without barriers or breaks).

Based on information available, Ursus Environmental identified and rated nine VECs occurring in the Park (Table 1). The overall



Courtesy: Rich Lovell
Red-listed Northern Goshawk.



Courtesy: US Forest
Blue-listed Western Screech Owl



Courtesy: Rod Gilbert
Blue-listed Macoun's groundsel

Rare or threatened species found in or known to use Mount Benson Regional Park.

conservation value of the Park is high, with individual VECs rated as moderate to high.

Table 1: Valued Ecosystem Components identified in the Park (Ursus Environmental, 2006)

Valued Ecosystem Component	Regional Importance Rating	Rating Rationale
1. Vascular plant diversity	High	117 species recorded to date
2. Rare/ uncommon plants	Moderate-high	2 Blue-listed species (current,/historical); 2 locally uncommon species
3. Fungal diversity	High	> 30 species recorded, many depend on stable older forest habitat
4. Rare/uncommon fungi	Moderate	1 species considered rare
5. Vertebrate diversity	High	At least 75 bird, 6 mammal, 3 amphibian species
6. Rare/uncommon vertebrates	Moderate-high	1 red-listed, 1 blue-listed, 6 locally rare bird species; potentially 1 federally-designated at-risk amphibian.
7. Ecosystem representation	Moderate	Spans 2 biogeoclimatic variants, contains unusual 'transition zone' features; 2 blue-listed forest ecosystems.
8. Sensitive ecosystem presence	High	16 ground-checked SEI polygons
9. Habitat connectivity	High	Provides elevation and wetland-to-upland corridors for wildlife
Overall Conservation Value	High	

3.2.2 Forestry

As stated earlier, past logging activities and major fires have shaped the forested slopes on Mount Benson. In 2003 and 2004, logging was conducted by the previous owner on the east portion of the Park.

In support of acquisition negotiations, a Timber Appraisal was conducted in September 2003 and updated in May 2005 following logging activity. Five significant forest cover types were identified in the Appraisal, including:

- *FH 320* – A 45-year old stand with Douglas fir and western hemlock as dominant species accounts for approximately 76 hectares (188 acres) of the Park area. The majority of the 2003 - 2004 logging was concentrated within this type.
- *FPI 320* – This 14.1 hectare (35 acre) stand contains a predominant mix of Douglas fir and lodgepole pine, growing on very shallow soils over bedrock.
- *HF (CyCw) 921* – Covering approximately 22 hectares (54 acres) of the property, this type consists of old-growth mix of over-mature western hemlock, Douglas fir, yellow cedar and western red cedar growing over shallow soils on bedrock. Due to limited availability of nutrients and moisture, trees in this type tend to show signs of decay or defect.
- *Non-Productive* – This type includes non-merchantable rocky areas, old roads and trails as well as inoperable bluffs. This area accounts for approximately 39 hectares (96 acres) of the property.
- *2003 and 2004 Logged Areas* – Impacted some 64 hectares (158 acres) of the east portion of the Park.



Natural revegetation of disturbed area

A 'rapid field assessment' of forestry values was conducted in August 2009 by Econ Consulting as part of this Plan. The full report is contained in Addendum 1. Main findings from this assessment include the following:

- Of the 64 hectares affected by recent logging, approximately 28 ha (69 acres) requires reforestation with the remainder being residual patches of standing timber, roads and trails, and rock outcrops.
- Varying amounts of naturally regenerated tree species (e.g., red alder, red cedar, Douglas fir, western hemlock, shore pine and western white pine) occur over the disturbed areas, but in general, these disturbed areas remain "not sufficiently restocked" (NSR) 5-6 years after logging.

- The disturbed areas are also covered to varying degrees with a diversity of other plant species typical of rapid revegetation, including fireweed, bracken fern, huckleberry, salal, grasses, etc. However, this brush layer should not pose a significant risk to further establishment of tree species by planting, but will likely continue to limit natural regeneration through light and moisture competition and seedbed limitations.
- With the exception of areas of exceptionally shallow soils around rock outcrops, much of the disturbed areas are readily plantable, though this needs more detailed analysis. Moderate planting effort will be required in areas of steep slopes, localized slash accumulations and well-established vegetation cover.
- The major slashpiles were burned in 2008. However, public access along roads and hiking trails combined with dry vegetation and remaining slash cover indicate that a fire hazard remains in mid- to late summer.
- Most of the logging roads in the disturbed areas are considered stable and require no special management. The exception is one steep section of Road #3, about 150 m below (east of) the intersection of Roads 1, 3 and 4 (see Addendum 1 map), which was constructed through a natural drainage bed and which now is subject to active erosion and bed transport.
- Former 'landings' and access trail edges would benefit from quick-growth revegetation, such as fall rye, to waylay erosion, then further rehabilitation with native grasses, legumes and grass tolerant conifers.
- No specific management issues were identified with the existing forested areas in the Park, other than ongoing fire protection and hazardous tree management.

The report presents options for reforestation of the disturbed areas from natural regeneration to full artificial reforestation, recommends a "supplemental reforestation" option, and discusses factors for species selection and restocking density. These points form the basis for policies and actions in the next section of this Plan.

3.2.3 Mineral Claims

In British Columbia, private land ownership does not usually include the rights to minerals or other subsurface resources. In most cases, the mineral rights remain with the Crown.

Under the *Mineral Tenure Act* (RSBC 1996), individuals are able to secure sub-surface mineral claims either through Legacy Claims or Cell Claims. Legacy Claims are ground-stake claims whereas Cell Claims are acquired by map selection through Mineral Titles Online (BC Ministry of Energy, Mines and Petroleum Resources).

Three Legacy Claims (406388, 406389 and 406625) originally covered lands within Mount Benson Regional Park, but expired on October 2004 and January 2005. Three Cell Claims Tenures currently overlap into the Park. Two of these (598484 and 598485) were claimed following designation of the Regional Park and as such, are subject to Section 21 of the Mineral Tenure Act, which states that *“Despite any Act, agreement, free miner certificate or mineral title, a person must not locate a mineral title, carry out exploration and development or produce minerals or placer mineral in a park created under an Act of British Columbia”*. As such, any exploration and development activity by the tenure holder must be conducted outside of the Park boundaries.



Hiking on Mt. Benson

The third Cell Claim Tenure (510914) was claimed prior to the designation of the Park and thus takes precedence and is not subject to Section 21 of the Act. In order to conduct exploration and development activity within the Park, the tenure owner is required to serve notice to the landowner (the RDN) under Section 19 of the Act.

Mineral claims grant exclusive rights to minerals in a defined area and claims must be maintained by paying a fee and by meeting minimum annual exploration and development work requirements outlined in Section 8 of the Act. This work may be non-intrusive (e.g. visual survey; collection of surface rocks) or intrusive (e.g. drilling holes, digging pits). Any work that disturbs the surface requires a permit under the *Mines Act*. Although notice to the landowner is required as per Section 19 of the Mineral Tenure Act, the landowner cannot prohibit entry but is entitled to compensation for loss or damage caused by the entry.

3.3 RECREATION

3.3.1 Local Demographics and Tourism Trends

In 2006, the population of the RDN was 138,631. Almost 57% of that population (78,743) lived in the City of Nanaimo, making it the second largest municipality on Vancouver Island after Victoria. Between 2001-2006, the RDN’s population grew by 9.1% (average 1.8%/year).

The average age in the RDN (46.6) is older than the provincial average (40.8). Only Electoral Areas A (13.8%), C (11.1%) and F (11.3) have fewer residents aged 65+ than the BC average (14.6%) (BC Stats Census Profile, 2006).

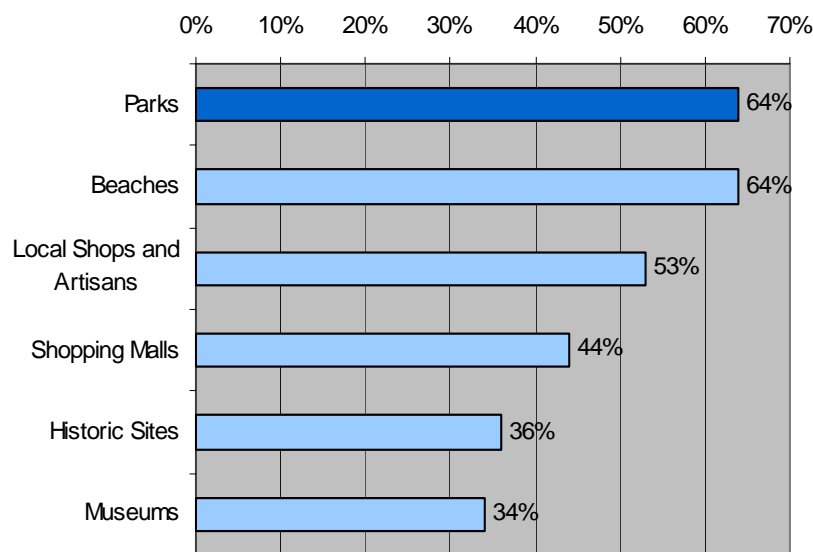


Figure 5: Top tourism attractions in Central Vancouver Island (Tourism VI, 2006)

Visitor profiles for the Central Island Tourism Region indicate that the two most popular activities visitors to Central Vancouver Island report participating in are hiking (50% of respondents) and wildlife viewing (40% of respondents). Other popular activities reported include bird-watching (24%), cycling/mountain biking (14%), and horseback riding (4%) (Tourism Vancouver Island, 2007). The same survey indicates that parks and beaches are the highest ranked attractions (64% each) for people visiting the Central Island (Figure 5). Features considered important in visitor decisions to visit

Central Vancouver Island included scenic beauty and outdoor recreation opportunities.

3.3.2 Relevant Recreation Trends

Individual and Informal Activities – Participation levels in many organized sports have declined in the past decade with an increase in individual activity preferences. The trend shows increased walking, cycling, gardening, cultural activities, outdoor education and ecotourism – which are largely individually-based activities.

According to the Recreational Trails Strategy for British Columbia Background Report (2007), hiking is the number one activity in North America. There has been an increase in demands for other uses, particularly mountain biking, which is one of the fastest growing segments of the outdoor recreation spectrum in BC.

Public Stewardship – As environmental awareness increases, emphasis on parks, natural areas and nature-based recreation takes on additional significance. The desire to learn about the natural environment through outdoor experience is growing and people are becoming increasingly willing to participate in projects to protect or restore sensitive environmental areas. Park programs are beginning to evolve to provide opportunities to help with inventory, restoration and enhancement projects.

Active Communities – The RDN is a participant in the provincial Active Communities initiative that seeks to “promote and support...a way of life in which physical activity is valued and integrated into daily life” (BCRPA, 2005). The goal of this initiative is to work with local governments and partner organizations to undertake actions that promote healthy lifestyles, build healthy communities and increase physical activity levels amongst British Columbians by 20% by the year 2010.

3.3.3 Current Park Use

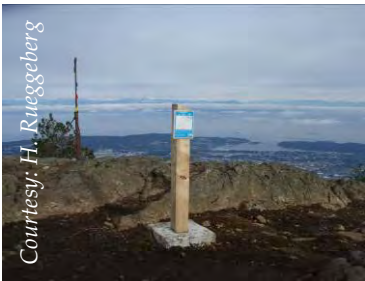
The slopes of Mount Benson have a long tradition of use by area residents and visitors. There are a variety of trails that have been constructed informally over the years, many based on pre-existing logging roads and others built to interconnect between these main trails.

Today, the mountain and its trails are used by a variety of outdoor recreation enthusiasts – including hikers, mountain bikers,



Courtesy: NALT

Informal sign installed by users of Witchcraft Lake trail.



Courtesy: H. Rueggeberg

Trail map installed by NALT/RDN at Mt Benson summit.

horseback riders, ATV'ers, snowmobilers and climbers. There has also been some amount of wilderness camping, both summer and winter, evidenced by the presence of flattened vegetation, fire rings, refuse and human waste.

There are four main points of access: Witchcraft Lake off Benson View Road; Westwood Lake; Nanaimo Lakes Road; and to a lesser extent, the end of Jameson Road. About 58% of park survey respondents indicated they use the Witchcraft Lake access and 56% use the Westwood Lake access, the two most popular trailheads.

There are additional but less well known points of access from logging roads or rights-of-way. These tend to link to one of the trails that start from the main access points.

As noted earlier, all park access trails start on lands outside of the Regional Park boundary and cross either private forestry land or crown land within the VIU Woodlot before entering the Park (Figure 6).

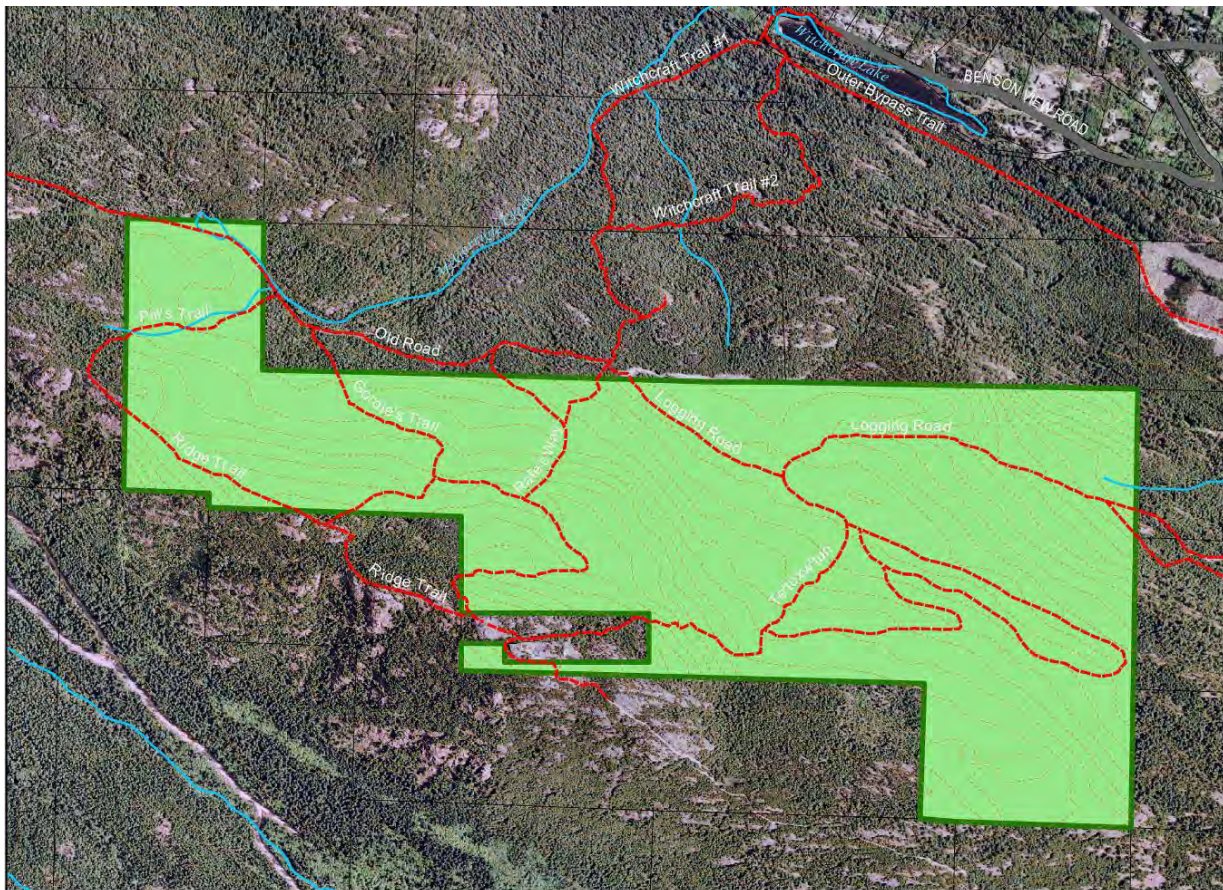


Figure 6: Existing trails in Mount Benson Regional Park

Trails to Mount Benson Regional Park tend to be steep and rugged and some are in relatively degraded condition. Trails within the Park are gradually being improved in partnership with NALT through the Job Creation Partnership (JCP) Program.

There are currently no services (e.g. pit toilets, garbage facilities, rest areas or benches, etc.) provided for park visitors within the Park. The RDN and NALT have erected some directional signs at park boundaries and major trail junctions and several of the major trails have been 'blazed'.

Park users have erected rustic signs and flagging tape along some of the trails leading to the Park boundary, notably the Witchcraft Lake and Westwood Lake trails.

Main Trailheads to Mount Benson Regional Park

Witchcraft Lake trail: originates off the west end of Benson View Rd. on City of Nanaimo property surrounding the Lake. Traverses City and residential properties to VIU Woodlot, and climbs through Woodlot to north boundary of Park. Roadside parking along Benson View Road; on busy days parking can impact area residents, blocking driveways and creating noise.

Westwood Lake: from Westwood Lake Municipal Park, trail crosses Hydro power line, through City of Nanaimo property before ascending through Island Timberlands property over flagged trails and logging roads to the east boundary of the Park.

Nanaimo Lakes Road: via gated and locked private forest service road across Island Timberlands property to the east boundary. A very long route for hikers, but accessible to mountain bikers. ATVs and 4X4s have traditionally accessed by requesting a key or, more often, maneuvering around the gate ends or breaking the lock.

Jameson Road: originates at locked gate at west end of Jameson Rd and traverses through west portion of VIU woodlot to west boundary of park. This route is less well known and used.

3.4 EDUCATION

As noted earlier, summer students from Malaspina University-College's (now VIU) biology department assisted with site inventories in 2003 and 2004, but there are no known regular and ongoing programs using the Park.

NALT, along with the RDN and City of Nanaimo, through their Active Living Guides, occasionally run guided hikes to the summit of Mount Benson.

Historical accounts show that there was an annual ritual for area schools to climb Mount Benson on Easter Break as part of school recreation programs. Currently, although schools may use the lower slopes or lands within the VIU Woodlot for educational programs, because of limited access issues into the Park proper (e.g. steep grades, lack of road), there are no known school programs using the Park site itself.

There is currently no interpretive signage in the Park with the exception of an area map located near the summit.

3.5 HISTORY AND CULTURE

3.5.1 Historical and Archaeological Values

Mount Benson, known as Te'tuxw'tun, is a sacred site of the Snuneymuxw First Nation and was an important area for Snuneymuxw ancestors to hunt and gather food.

The mountain is named after Dr. Alfred Robson Benson, a physician who served with the Hudson's Bay Company from 1857 to 1862 and then with the Vancouver Coal Company.

In 1912, Mount Benson was proposed as a possible site for the new Dominion Astrophysical Observatory by the Meteorological Service of Canada. In the end, a site in Saanich was chosen.

The west summit housed a fire lookout station from 1925 to the mid 1960s. The original wood-frame structure was burned down in 1938 and replaced by a second structure until 1967. The road to the fire lookout station was improved in 1927 which triggered the summit becoming an attraction to local citizens and tourists. Some



Original Fire Lookout

A plane crash in 1951 was the worst aviation accident in BC history at that time. Flight PBY-A5 was travelling from Kemano to Vancouver and may have been blown off course. The plane hit the side of Mount Benson around 490 m elevation and burst into flames, killing all 23 on board. Until recently, plane remnants could be found on the slopes, but by now, most have been removed by 'treasure hunters'.



Remnants from 1951 plane crash.

long-time Nanaimo residents have recounted memories of driving to the summit for family picnics, weddings, family outings and to visit the fire lookout.

There are no known archaeological sites within Mount Benson Regional Park.

3.5.2 Community Identity and Sense of Place

Mount Benson's prominent green slopes set the backdrop for the City of Nanaimo and surrounding area. From tales of hikes in the Times Colonist in 1913, to recent stories of weddings on the summit, to inspiring poetry, Mount Benson means many things to many people, but what is common is the community's connection to the mountain.

NALT's fundraising campaign raised the community profile of the mountain and brought out stories from a variety of people highlighting its importance in the hearts and minds of the people of Nanaimo and area. NALT continues to maintain historical records and photos of the many stories and memories that record Mount Benson's past.

The acquisition and designation of Mount Benson Regional Park in itself is a remarkable story of a community coming together with a common purpose – to ensure a continuing green landmark for the City of Nanaimo.



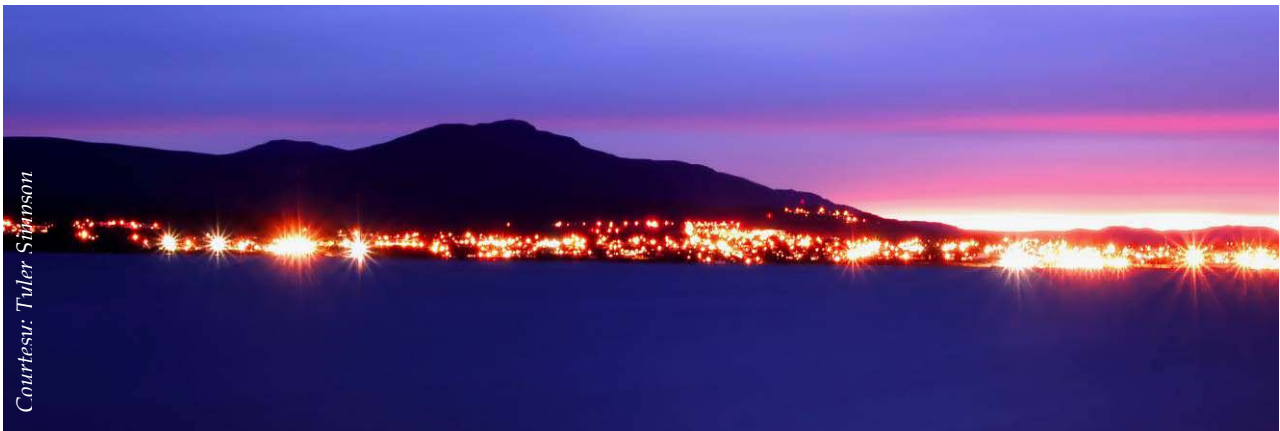
With donation from Mountain Equipment Coop, NALT reaches fundraising goal

4.0 VISION, PRINCIPLES AND GOALS

4.1 VISION STATEMENT

A vision statement sets the tone for the long-term management of Mount Benson Regional Park and defines the context within which short-term actions can occur.

Mount Benson Regional Park is and will remain a wilderness park with inherent ecological, recreational and historical values. The Park's natural habitats and sensitive ecosystems will be preserved and enhanced. At the same time, the Park will provide outstanding, ecologically-sensitive recreation opportunities to area residents and visitors. Mount Benson Regional Park is part of the Nanaimo's dramatic mountain backdrop and will remain a natural landmark in the Regional District.



4.2 MANAGEMENT GOALS

The following management goals set the framework for policies and management actions related to Mount Benson Regional Park. The coloured dots are used in Section 5 to indicate how each policy relates to these goals.

4.2.1 Environment ●

To protect and restore natural habitats found within Mount Benson Regional Park.

4.2.2 Recreation and Education ●

To provide recreational and educational opportunities that are compatible with the ecological values of Mount Benson Regional Park and its sensitive habitats; and, to take a long-term approach to improving accessibility to the Park and its viewpoints.

4.2.3 Management and Stewardship ●

To work together with the larger community - including the Snuneymuxw First Nation, educational institutions, community organizations, neighbouring landowners and tenure holders, government agencies, volunteers and the public - in the short-term management and long-term stewardship of the Park.

4.2.4 Visual Integrity ●

To maintain a natural, green backdrop for area residents and visitors and to ensure that management decisions and actions in Mount Benson Regional Park do not adversely impact the Nanaimo and area's view of the mountain.

4.2.5 Public Safety ●

To address park safety while respecting the wilderness context of the Park, and to cooperate with neighbouring landowners and managers to minimize natural and human-induced risks within the Park and on the surrounding lands.

4.3 MANAGEMENT PRINCIPLES

The following principles represent the basic ‘rules’ that underlie this Management Plan, and which all management policies and actions regarding the Park must observe.

4.3.1 Conservation Covenant

Upon adoption of this Plan, a *Conservation Covenant* will be placed on the Park properties, attached to the land titles. The terms of the Covenant will reflect the RDN’s Regional Park goals and policies and the specific management directions defined through this management plan, while protecting NALT’s interests in the conservation values of the lands and future management of the Park. NALT will take the lead role as one of two Land Trust organizations holding the covenant and will be responsible for annual monitoring of its terms.

4.3.2 RDN Regional Parks and Trails Plan 2005-2015

The RDN’s *Regional Parks and Trails Plan 2005-2015* sets out the future direction, policies, priorities and actions for regional parks and trails. The vision outlined in this plan is for a system that protects and stewards natural values while providing rewarding recreational opportunities; fostering education and appreciation of the natural environment; and, enhancing the livability of the Region. Management of Mount Benson Regional Park must work within this greater vision.

4.3.3 RDN Park Use Regulations Bylaw No. 1399

The RDN’s *Park Use Regulations Bylaw No. 1399 (2004)* regulates park use in community and regional parks. Mount Benson Regional Park is listed as a Level 4 Park – “Undeveloped Park, Trail and other Open Space”.

4.3.4 Cercomm Easement

Cercomm Electronics Ltd. currently holds an easement over the Park lands (*Cercomm Easement*). This document grants Cercomm the rights to construct, install and maintain an access road as well as poles, wires, conduit and other apparatus for the supply of electrical power using reasonable efforts to minimize the footprint of such construction within the Park. Once permanent elements are

constructed, the easement will be modified to include only the as-built areas.

4.3.5 Park Access

At this time, the Park is accessible only by crossing private lands held by timber companies or residents, or Crown land held in woodlot tenure by Vancouver Island University. The cooperation of these neighbours is essential to the long-term public use and management of the Park.



View west from the summit

5.0 MANAGEMENT POLICIES AND ACTIONS

The process to create this Management Plan revealed several key issues regarding the current use and future directions for Mt Benson Regional Park. The following section is organized around these key topics. For each topic there is a summary of the issue(s), followed by management policies and actions to address the issues over the next 10 years, and in some cases, beyond. Each policy is colour coded to relate it directly to the one or more of the five goals stated in the previous section.

5.1 BALANCING CONSERVATION AND RECREATION

The Issue:

There were numerous comments on the survey and at the Open Houses that the Park should remain natural and that its management should respect natural values and focus on conservation. 62% of survey respondents indicated that one of their top three reasons for visiting Mount Benson Regional Park was for the wilderness experience.

At the same time, over 80% of respondents use the Park/mountain for walking and hiking, 60% state that they enjoy the physical and mental health benefits derived from trail use and many comments were made about improving and expanding the trail system.

Balancing environmental protection with outdoor recreation opportunities is a universal issue – and this dilemma is only intensified in wilderness parks like Mount Benson.

Policy 1:

Park use zones will be established to effectively manage Mount Benson Regional Park for both conservation and recreation.

Designating zones within a park is a common method for managing uses in accordance to environmental sensitivities and the capacity of different areas to withstand public use. Park zones identify the types and levels of use that are appropriate to different parts of the Park. Zone designations are intended to protect and enhance

14 key management issues:

- Balancing Conservation and Recreation
- Protecting Environmental Values
- Forestry Resources
- Mineral Resources
- Park Accesses
- Park Accessibility
- Trails Use and Management
- Park Information and Signage
- Visitor Facilities
- Commercial Facilities and Activities
- Education and Interpretation
- Park Stewardship and Operations
- Fire Safety and Emergency Planning
- Future Acquisitions

environmentally sensitive features while recognizing long-standing uses and public preferences, thereby reducing existing and potential conflicts between recreational uses and environmental conservation.

Taking this into account, this plan subdivides Mount Benson Regional Park into two types of park zones (Figure 7):

- **Conservation Zone:** the management focus is to protect, conserve and enhance the natural landscape and wildlife habitats. The conservation of ecological assets takes precedence over human activities in these areas.
- **Natural Environment Zone:** the management focus is to protect natural values while providing non-motorized recreational opportunities in a natural environment. In this case, the distribution of this zone recognizes the established trail system in the Park. The non-motorized activities permitted in this zone are intended to have low impact and involve limited development while providing meaningful recreation opportunities. Motorized vehicles are allowed only for emergency and servicing/maintenance purposes authorized by the RDN.

5.2 PROTECTING ENVIRONMENTAL VALUES

The Issue:

Park management must ensure that impacts on ecologically sensitive areas are avoided or minimized and that the natural values of the Park are protected.

Policy 2:



The RDN and NALT will work with partners to inventory, monitor and restore the natural ecosystems and wildlife habitats found within Mount Benson Regional Park.

To preserve the environmental values of the Park, it is vital to know what those are – e.g., the full range of ecological features, conditions and processes that support the mountain’s habitats and biodiversity – and the management actions that will protect those values.

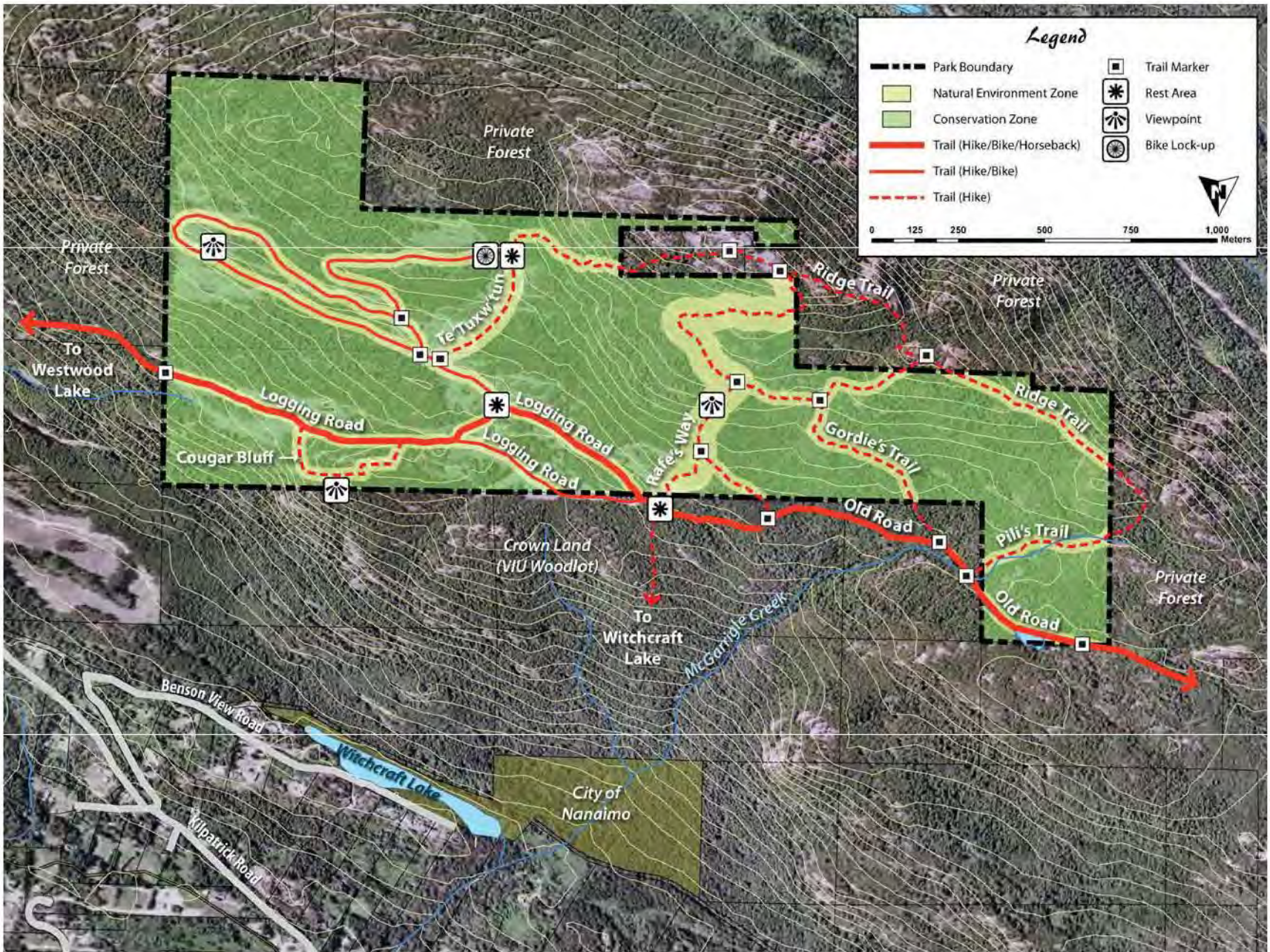


Figure 7: Park Management Site Plan. NOTE: all trails and trail markers shown outside park boundaries are subject to completion of agreements with neighbouring landowners.

As mentioned in section 3, several inventory projects were conducted in 2002-2006 to document the status of SEI-based sensitive ecosystems in the Park. Ursus Environmental noted that three of the SEI sites could not be accessed and verified; as well there are portions of the Park that have not been surveyed for the presence of SEI-type ecosystems. Park stewardship activities have also identified the presence of several wetlands within the Park.

Action 2.1: Complete ground verification of SEI polygons and SEI-equivalent sites; survey the remainder of the Park not covered in previous inventories for environmentally sensitive features.

Action 2.2: Establish and operationalize an environmental monitoring program; review after 5 years.

Beyond initial inventories, ongoing monitoring is fundamental to the conservation of ecosystems and wildlife populations in the Park. It is not possible to inventory and monitor every species, population or plant community that occurs in the Park. However, inventory and monitoring of a few carefully chosen indicator species can act as a bellwether of the general ecological health of the Park's ecosystems and biodiversity. For example, Ursus Environmental suggests an inventory of breeding use of the site by amphibians and birds of prey. The RDN and NALT should confer with local ecologists (e.g., Ursus, VIU) on the best indicator species for this area.

In addition, monitoring activities can be linked with educational programs to create meaningful experiences for students and to nurture greater public understanding of the natural values found in the Park.

Action 2.3: Establish a process for measuring and monitoring the impacts of human use on the Park's environment.

Standard methods applied in BC Parks will be used to assess the impacts of recreational use on sensitive sites or habitats. Mechanisms to ensure that the impacts of recreational use are minimized are included in Section 5.5.

Action 2.4: Continue to identify projects and pursue funding opportunities to restore and/or enhance the biodiversity and sensitive ecosystems of the Park.



Wildflowers in the Park.

For example, in summer 2009, NALT began an 11 month habitat restoration and enhancement project with funding from the BC Ministry of Housing and Social Development's Job Creation Partnership Program. The crew will carry out invasive species removal, wetland enhancement, stream-bed remediation and reforestation of the logged areas of the Park.

5.3 FORESTRY RESOURCES

The Issue:

The 64 ha area that was logged in 2003-2004 needs to be more intensively managed to re-instate a natural forest system, stabilize soils and reduce the potential fire hazard.

Policy 3:

In general, forest management in the Park will be guided by the report "Mount Benson Regional Park – Review of Natural Values – Forestry", attached as Addendum 1 to this Plan. In particular:

- Reforestation of the recently logged portions of the Park will consist of a combination of option 1 "Natural Regeneration" and option 2 "Supplemental/Partial Artificial reforestation" from that report.
- Reforestation will focus on achieving natural habitat diversity and slope/soil stability as opposed to harvestable timber, using a range of naturally occurring and ecological appropriate tree and plant species.
- Revegetating former landings and trail edges through the logged area will be emphasized.

NALT has also been working with Econ Consulting on more detailed replanting prescriptions for the logged portions of the Park.

Action 3.1: *Based on the report in Addendum 1, complete and implement a more detailed silviculture plan/prescription for the logged portions of the Park, with assistance from a Registered Professional Forester as needed, that:*



Assessing disturbed areas

- Identifies and prioritizes sites or patches to be actively reforested (assuming that the remainder of the logged area outside these patches would be subject to natural revegetation);
- Specifies species mixes and densities for each reforestation site;
- Identifies sites (landings and trail edges) to be grass seeded, and the seed mixes to be used along with supplemental tree planting;
- Sets out seasonal timeframes for replanting activities;
- establishes a program for monitoring replanting success; and
- identifies roles and responsibilities for each activity.

Policy 4: 

Other than hazard tree management and fire protection as needed, no active management activities will be pursued in the existing forested areas.

Action 4.1: Identify a strategy, including roles and responsibilities, for monitoring and addressing tree hazards along the Park's trail system; include a method for allowing trail users to report downed trees, hazards, etc.

Section 5.13 and Policy 23 (below) address fire prevention planning and fuel management.

5.4 MINERAL RESOURCES

As discussed in Section 3.2, of the three mineral claims that overlap the Park, only one has active rights within the Park boundaries that may affect the Park's management.

Policy 5: 

The RDN will work to ensure no mineral claims are held on the Park property.

The objective here is to protect the environmental and recreational values of the Park from impacts related to any future mineral exploration and development works. Ideally, the RDN should obtain a written agreement or memorandum of understanding that recognizes the Park's goals, defines the claim holder's objectives, and provides the RDN the opportunity to review and comment on

the claim holder's proposed activities well in advance of those activities.

Action 5.1: Negotiate with the current mineral claim holder to remove the existing mineral claim within Mount Benson Regional Park.

5.5 PARK ACCESSES

The Issue:

All trails leading into the Park lie across Crown (from Witchcraft Lake or from Jameson Road across the VIU woodlot) or private lands (from Westwood Lake across Island Timberlands property; or from forest service roads on Island Timberlands and TimberWest properties). A short portion of the trail access from Witchcraft Lake also crosses the south ends of two residential lots. In other words, there are no official *public* access points to the Park property.

Lack of parking is an additional issue at the trailhead at Witchcraft Lake. 'No Parking' signs have been erected at the end of Benson View Road to make sure that the turnaround is left free and driveways of local residences are not blocked. However, on busy weekends, the road can become clogged with parked cars and the vehicle frequency can be disruptive to this quiet neighbourhood.

Policy 6:

The RDN will work with neighbouring landowners to formalize main access routes to the Park, for public use as well as for park maintenance and emergency access.

Action 6.1: Work with VIU and the Province to establish formal trail accesses to the Park from Witchcraft Lake and from Jameson Road.

VIU recently received formal approval from the BC Ministry of Tourism, Culture and Arts to construct and maintain a recreational trail on Woodlot Licence 0020 between Witchcraft Lake and the Park, under the authority of sec.57 of the Forest and Range Practices Act. Permission was granted under the following conditions (B. Ostrand, Woodlands Manager, VIU: pers. comm.):

- The trail is constructed and maintained to minimize erosion resulting from trail use.

- The trail is open to the public and there are no restrictions on use of the trail.
- There is no restriction on other resources uses (such as forest harvesting) inherent in this authority.
- Good communication is maintained between VIU and the RDN to ensure coordination of trail management.

VIU also recognizes that much of the trail off Jamieson Road follows an old logging road, which VIU intends to rehabilitate in some 5-10 years (*ibid.*).



Steep trails in Mt. Benson Regional Park.

Action 6.2: Complete an agreement with Island Timberlands and the City of Nanaimo to establish long-term trail access to the Park from Westwood Lake across Island Timberlands property.

Although the City of Nanaimo is agreeable to the use of Westwood Lake as a trailhead, neither the City nor the RDN can legally establish and sign trails that travel over private forest land. The existing informal trails from Westwood Lake travel through recently cleared areas and logging roads on Island Timberlands property, making the route to the Park difficult to find for those unfamiliar with the area.

- Trail location, design standards, construction, signage and maintenance responsibilities will be part of all trail access agreements.

Action 6.3: Work with the City and the Ministry of Transportation and in consultation with local residents and the public on an appropriate location or locations for parking near the Witchcraft Lake trailhead. In partnership with the City, design and construct parking areas.

The RDN has initiated discussions with the City of Nanaimo and the Ministry of Transportation to find better parking near the Witchcraft Lake trailhead. Ongoing planning and design will involve the residents along Benson View Road. Refer to Section 5.9: Visitor Facilities for details on development of a trailhead area at Witchcraft Lake.

Action 6.4: Work with the City of Nanaimo and neighbouring private land owners near Witchcraft Lake to resolve the existing trail routing over private property.

This should be resolved in concert with Action 6.3 to determine the appropriate parking and trailhead location.

5.6 PARK ACCESSIBILITY

The Issue:

Currently, the Park can be legally accessed only via the trail system on foot or bicycle; all roads that lead to the Park are gated private forest service roads and not open to the public. The trails to the Park are steep and rugged, limiting access by the physically challenged, elderly, very young or those not otherwise able to undertake the steep hike. Hence, only those with the physical ability and desire can technically access the Park and enjoy the views from the summit.

Some long-time residents have fond memories of the days prior to the 1970s when the road to the fire tower allowed anyone with an adequate vehicle to drive to the summit of Mount Benson. Several survey respondents and participants at the public sessions indicated a strong desire to see some form of access to the Park reinstated so that people of all ages and varying levels of physical ability can enjoy the Park. There are also economic benefits that could be enjoyed in the community by offering the mountaintop views as a visitor and tourist attraction.

Several paragliders and hang-gliders indicated their interest in using the summit of Mount Benson as a launch point. A requirement for this would be access to a road as well as a constructed launch.

There was also a strong public voice from those concerned about preserving the wilderness character of the Park. Roads, gondolas, or railway lines could negatively impact sensitive ecosystems in terms of their respective footprints and the greatly increased foot traffic, particularly at the summit. There are concerns about the effect of increased noise on wildlife and the existing 'peace and quiet' of the mountain and the Park, as well as visual impacts of a gondola or railway line up the highly visible north side of the mountain. Access by mechanical means could also negate the sense of accomplishment achieved from summiting the mountain, and some respondents opined that a road or gondola would be just a foot in the door to commercialization of the Park or summit.



The Grouse Gondola.



Narrow-gauge railway in Snowdon Park (Wales)

During the course of the planning process, several forms of access to the Park were discussed, including:

- **Road** – based on reinstating the remnant service road that winds up the east and south sides of the mountain or the construction of a new road to its summit. According to a property appraisal completed in 2006, the estimated cost of extending a public road to the Park property would be in the range of \$1.5 million plus right-of-way negotiation costs. Given its responsibilities and priorities for the entire regional parks and trails system, this would not represent wise use of the RDN’s limited park management budget.
- **Gondola** – public response on this idea was split with interests both strongly for and against indicated at the public sessions and in the survey.
- **Narrow-gauge railway** – proposed in the past up the north side of the mountain.

As indicated in the RDN Regional Parks and Trails Plan, although the RDN will strive to provide “opportunities to all RDN residents to access and enjoy regional parks and trails”, this may be constrained by topography, environmental values, cultural/historic sensitivities and cost.

In the case of Mount Benson Regional Park, these factors are compounded by the private ownership of surrounding lands, all of which severely limit opportunities to undertake major access upgrades in the short-term – i.e., within the timeframe of this Plan. However, as the RDN and Nanaimo area continue to develop, future opportunities to improve access to the Park could arise from private or community interests and may warrant consideration.



Hiking in the Park.

Policy 7: ● ●

Public road access to Mount Benson Regional Park will not be actively pursued by the RDN during the term of this management plan. However, the RDN may consider proposals from private interests for road, gondola or other forms of access into the Park or to its boundaries, subject to rigorous and extensive assessment of: impacts on the environmental and visual integrity of the Park; socio-economic impacts in the surrounding area; and full business-case scenario planning.

Special Events

Special events are regulated through the Park Use Bylaw No. 1399 (2004) and Amendment Bylaw 1399.01 (2009). Under this bylaw, the RDN may permit use of the Park or its trails by groups provided that: a) the use is compatible with the purpose and management of the Park; b) the group accepts full responsibility for maintaining the site during the event; and c) the group restores the site to existing conditions after completion of the event.

5.7 TRAILS USE AND MANAGEMENT

Issue 1 – Motorized and Non-motorized Trail Use:

Given its proximity to a growing urban area, Mount Benson is used by a wide variety of outdoor recreationists including hikers, mountain bikers, ATVers, horseback riders, climbers, snowshoers and snowmobilers.

Walking and hiking was by far the highest use in the Park identified by survey respondents (83.0%), followed to a significantly lesser degree by nature study (19.4%) and mountain biking (18.5%). Other non-motorized recreational activities that were mentioned in the Park survey and at open houses include horseback riding, running, snowshoeing and rock climbing.

15.4% of respondents indicated all-terrain vehicle (ATV) or 4X4 use, while a number in the 'other' category (16.7%) listed snowmobiling among their uses of the Park. ATVs, motorbikes and other off-road vehicle drivers have traditionally used the logging roads on the slopes of the mountain and the access road on the south side of the mountain to the summit.

The role of regional parks as defined in the RDN's Regional Parks & Trails plan includes "providing opportunities for a range of outdoor experiences in a natural or semi-natural setting". At the same time, the RDN's Park Bylaw No. 1399 stipulates that no motorized recreational vehicles are permitted in RDN park properties.

The basis for this restriction is that *on a per capita basis*, ATVs and other motorized vehicles can have significantly greater negative impacts on the natural environment than non-motorized users. In addition, the experience and safety of other user groups can be



Trail improvements through the JCP program.

compromised by the noise and trail degradation caused by motorized use. Also, the RDN does not have the resources to police or maintain trails for motorized use.

Issue 2 – Trail Conditions:

Due to the steep, rocky terrain, poor drainage and increasing level of use, portions of trails leading to and within the Park are in poor condition. Over 44% of survey respondents indicated that they are satisfied to very-satisfied with the trails in the Park. However, there were numerous requests for a trail through the VIU woodlot with switchbacks to reduce grade and improvements to reduce erosion.

There is also a desire for additional trails within the Park, particularly in areas containing former or decommissioned logging roads. There was support indicated for designated mountain bike trails within the Park.

Trails within Mount Benson Regional Park are gradually being improved in partnership with NALT using federal Job Creation Partnership funding. The VIU Forestry Department has also indicated interest in improving one of the trails leading through its woodlot from Witchcraft Lake. As required under its woodlot license, VIU is submitting an application to the Ministry of Tourism, Culture and the Arts to develop a recreational trail.



View from Cougar Bluff.

Policy 8: ●●●●

Management of the Park will support a non-motorized multi-use trail network while protecting sensitive habitats and minimizing user conflicts.

Figure 7 shows a conceptual trail network for the term of this management plan. This plan is subject to review and revision based on user trends and impacts observed over the next five years.

The trail network is based largely on existing trails and decommissioned logging roads, and recognizes three types of trails:

- hiking only – these are generally very steep trails not conducive to other uses.
- hiking + mountain biking – these trails tend to be former logging roads with sufficient width to accommodate both uses.

- hiking + mountain biking + horseback riding– along former logging roads that provide an east-west route through the Park.

The network includes additional multi-use trails on decommissioned logging roads in the eastern portion of the Park, which currently see little use but which can provide an enjoyable alternative to trails to the summit.

Policy 9: ●●●

Any future trail development and re-alignment will seek to avoid alteration or damage to any sensitive ecosystems, or to minimize such impacts where avoidance is not possible.

Action 9.1: Identify trail sections near environmentally sensitive areas and take appropriate actions as needed.

This may include:

- Realigning the trail section away from the sensitive areas.
- Reinforcing the trail surface or improving drainage to help ensure that users do not stray off the trail surface.
- Constructing physical or visual barriers to prevent intrusion into the sensitive areas.
- Installing signs informing of and requesting respectful avoidance of the sensitive areas.

Action 9.2: Assess, re-route and reinforce the trail to Cougar Bluff as needed, to ensure public safety and to minimize disturbance to the Bluff's sensitive vegetation.

An existing trail to Cougar Bluff, an ecologically sensitive site, will be upgraded to provide access to this destination while protecting its ecological features. This route will provide outstanding views over Westwood Lake and the City of Nanaimo to the Georgia Strait and Coast Mountains for those seeking a shorter hike than the summit route.

Policy 10: ●●●●

New trails and trail upgrades within the Park will be designed and constructed to standards appropriate to the type and level of use of each trail and that aim to ensure environmental protection



Difficult trail conditions.

and public safety. Nonetheless, trails will continue to be provided on a 'use at own risk' basis.

Action 10.1: Develop a detailed trail plan that identifies the different types of trails. These types may include:

- Nature or natural walking/hiking only trail.
- Mountain biking/hiking trail.
- Mountain biking/horseback riding/hiking trail.
- Trails that will also be required to support vehicle access for maintenance and operation purposes (former logging roads).

Action 10.2: Develop and prioritize a complete list of trail system improvements.

Action 10.3: Determine the need for rehabilitating the drainage and erosion issues associated with the former logging road and commission a rehabilitation project that meets those objectives.

Correcting the ongoing erosion and sediment transport on road #3, between areas 2 and 3 (see Econ report), is necessary to maintain access to the Park for maintenance and emergency purposes, and to alleviate sedimentation impacts on downstream aquatic habitats.



Pets in the Park.

Policy 11: ● ● ● ●

Pets must be under human-control at all times in the Park.

Although not identified as a problem at this time, with the growing popularity of dog companionship, there is the potential for wildlife harassment, habitat damage and conflicts with other park users.

RDN Park Use Bylaw 1399 does require that pets in regional parks be kept under control at all times. As in other regional parks, enforcement of this provision in Mount Benson Regional Park will be primarily through awareness and 'peer pressure' by other park users. If complaints surface, the RDN may consider requiring dogs to be on leash, again enforced primarily through signage and peer pressure.

5.8 PARK INFORMATION AND SIGNAGE

The Issue:

Not knowing how to access the Park (43%) and not being able to find their way around the Park (almost 30%) were the two most frequent limitations listed in the Park survey.

There were numerous comments on the survey requesting better information on getting to the Park. It appeared that many respondents were not clear about the Park location — particularly that it encompasses only a portion of Mount Benson.

Generally, respondents indicated a strong desire for a well-marked trail system with better directional signage. There were requests for more information to be included on trail signage — including approximate distances, travel time and level of difficulty. There were also requests for more public education signage, particularly related to litter.

Signs can help to educate, alleviate negative impacts, enhance visitor safety and generally realize the Park vision and goals. To do this, park signage falls into three categories:

- *Informational* – general information about the location, natural and cultural history and context for the Park, its features and facilities; may include interpretive signage.
- *Regulatory and risk management* – identify park hazards, set out do's and don'ts, and provide information on emergency services within the Park.
- *Directional* – way-finding within the Park, including trailhead and trail maps, arrows, travel distances and 'blazes'.

The RDN and NALT have installed some directional signage and fire prevention signs within Mount Benson Regional Park, including small park maps at major intersections (see Figure 7).

However, for liability reasons, the RDN cannot as yet sign trails leading to the Park through private lands. As a result, trail signage has not been installed at major trailheads such as Witchcraft Lake or Westwood Lake. In the neighbouring lands, informal signs and flagging have been placed by past users, but it is 'hit and miss' and the long-term status is uncertain. This issue will be alleviated once



Example of RDN trailhead kiosk at Top Bridge Regional Trail

long-term trail access agreements with neighbouring property owners have been secured. Part of the access agreement consultation process should address signage on trails that cross neighbouring properties.

Policy 12: ● ● ● ● ●

The RDN and NALT will collaborate on developing a strategic sign system within the Park that includes informational, regulatory and directional signs at key locations along the trail network.



Example of effective trail user sign.

Figure 7 indicates some of the trail locations that would be key sites for park signs. Other factors to consider in a sign system are:

- Consult with neighbouring landowners once agreements are in place on sign information and location.
- Ensure sign design and materials are in keeping with the character of Mount Benson Regional Park and do not detract from the wilderness setting. The RDN has developed a sign standard that reflects the general character of the regional park system as well as being durable and practical to maintain. This standard will be used and modified as needed for sign design and construction in this Park.
- Create effective park entrance signs that can serve as information sources, advising visitors of the special features and potential hazards of the Park. These should be installed at formalized trailheads (e.g., start of Witchcraft Lake trail), but also considered for points where informal trails enter the Park (e.g., Jameson Road access point). Information to include:
- Caution about the degree of physical ability required to access the Park – including information on the length of time that should be allowed and that the climb is very strenuous.
- Personal safety in a wilderness park – e.g., travel with someone else or let people know where you are going and when you are expected back; carry a cell phone and first aid kit, water, snack, clothing layers appropriate to changes in weather, etc.
- Rules of the trail – e.g., no motorized vehicles, pack-in, pack-out, no camping, trail etiquette for multi-use trails, etc.

- Provide clear directional signage throughout the Park to improve park navigation. Trail markers should indicate trail distance, difficulty and should indicate the type of use (e.g. hiking and/or biking) to reduce trail use conflicts.
- Provide interpretive signage at strategic locations to educate visitors about various park hazards or environmental issues and management actions being carried out to alleviate these issues.
- Use park signage and a variety of media (e.g. web site, brochures) to assist the public in understanding the reasons behind park rules and regulations.

Policy 13: ● ●

The RDN and NALT will collaborate on communications about the Park on their respective websites and any written materials that are made available to the general public.

Information about the Park will reside primarily on the RDN's website with appropriate links from NALT's website.

5.9 VISITOR FACILITIES

Currently, visitor facilities within the Park are minimal. Topics and issues raised through the public planning process include the following:

Issue 1 – Refuse and Human Waste:

There are no garbage receptacles or toilets in the Park. With Regional Park designation, there is the potential for increased usage – which could bring more litter and waste. However, given the Park's location and difficult access, the logistics of garbage pick-up and maintenance of even pit toilets are difficult and expensive.

There were some suggestions in the Park survey regarding installation of garbage receptacles. There was also a strong interest in improving education about 'leave no trace' and 'pack it in, pack it out' ethics. There were several comments suggesting organized clean-up events.



Refuse in the Park.

Issue 2 – View Points and Rest Areas:

While there are a number of popular spots to stop for a rest and to take in the view on the trails to the summit, currently there are no developed view points or rest spots in the Park.

There were several suggestions in the Park survey for benches and other viewing facilities. There was also some interest in larger facilities such as a safety shelter and picnic tables.

Issue 3 – Camping and Overnight Use:

Mount Benson has been and continues to be used by the community for overnight camping. Several sites have traditionally been used including a lower bluff, the summit, and a flat site beneath the summit off the Te'tuxw'tun Trail. In all cases, evidence of these camping areas is left by campfire rings, environmental damage (burned trees, broken branches, crushed moss and lichen, etc.) as well as refuse and human waste.

Under the Park Use Regulation Bylaw 1399, camping is allowed only in designated campsites in regional parks that have constructed camping areas – i.e., Horne Lake and Descanso Bay Regional Parks. The primary reason for this restriction is that wilderness camping can quickly overwhelm the capacity of the backcountry to absorb impacts, destroying habitat and spoiling wilderness experiences for all. Wilderness camping can also be a wildfire hazard. In addition, the RDN does not have the resources to build or maintain facilities to support wilderness camping (outhouses, tent pads, etc.) or oversee their use, particularly in remote locations like Mount Benson Regional Park.

Camping on Mount Benson was not indicated as a key issue at the public sessions. There were a few requests for camping facilities in park survey comments; but at the same time, there were also requests to keep the recreational impact low.

Policy 14:

Mount Benson Regional Park will be equipped with simple day-use facilities that are in keeping with its wilderness character and that can be readily maintained by RDN staff, contractors or volunteers.

The Regional Parks and Trails Plan states that a strategic approach to park improvements will be used that reflects levels of use, minimizes maintenance requirements and offers resistance to vandalism.

In Mount Benson Regional Park, this translates to a few facilities of rustic but resilient design in key sites. The objective is to enhance the visitor experience in simple ways while minimizing the potential to disrupt the Park's environment and the enjoyment of that environment. Any constructed facilities will be minimal and rustic in nature.

Action 14.1: *Prioritize and construct simple use facilities at Rest Areas and Viewpoints indicated on Figure 7 of this Plan.*

Figure 7 indicates locations of rest areas and viewpoints, primarily to indicate popular spots with good vistas and enough flat area to offer a reprieve from the steep climb. In the short term, these sites may be equipped with simple benches constructed from logs found on site. This provides easier seating for hikers while helping to prevent widespread disruption of vegetation at the site. In the longer term (> 10 years), these sites may support pit toilets or picnic tables if warranted by use and servicing access.

Action 14.2: *Design and construct appropriate visitor facilities at the Witchcraft Lake trailhead once access and parking issues are resolved.*

Garbage and recycling receptacles and a pit toilet will be considered in the design of the Witchcraft Lake trailhead and parking area where these facilities may be effectively maintained. Informational signage on packing waste out of the Park will also be included (see Section 5.11).

5.10 COMMERCIAL FACILITIES AND ACTIVITIES

With the gondola and road concepts have come suggestions of permitting fixed commercial facilities, such as a restaurant or gift shop, within the Park at or near the summit of Mount Benson. Responses from the public on these ideas were mixed, but with a majority speaking against such enterprises.

Under the Regional Parks and Trails Plan, the RDN's current policy regarding commercial activities in regional parks is to "allow commercial services that are program-oriented, personal services,



Example of a simple log bench.

such as guided programs or outdoor recreation activity training, and that meet the following conditions:

- The service or activity is an appropriate outdoor recreation activity;
- The service is compatible with the particular regional park management plan;
- The service could not be operated effectively outside the Park boundary.”

Any commercial activities in regional parks must first obtain a permit issued under the Park Use Regulation Bylaw.

Policy 15: ●●●●

The only commercial (i.e., for profit) activities permitted in the Park will be commercial guiding and interpretive programs, and these will only be permitted subject to the provisions of a permit issued under the Park Use Regulation Bylaw. No commercial facilities (e.g., food or gift services, commercial signs, etc.) will be supported at this time.



NALT guided hikes up Mt. Benson.

5.11 EDUCATION AND INTERPRETATION

The Issue:

The public survey indicated a general interest in natural and/or historic interpretation at the Park, with approximately 63% of respondents supportive of interpretive programs. However, emphasis was placed on the importance of keeping the Park natural and minimizing the impact of interpretive signage.

An interpretive program can enrich visitor experience as well as help to promote public understanding of park goals and objectives. An interpretive program can consist of signage as well as both guided and self-guided tours. In the design of a program for Mount Benson Regional Park, it is important to be mindful of the rustic, wilderness character of the Park.

Policy 16: ●●●●

The RDN and NALT will develop an interpretive program that provides information about the natural and/or historical features

of the Park and aids public understanding of the Park goals and management policies.

NALT continues to offer guided hikes to Mount Benson during the spring, summer and fall. Both the RDN and the City periodically offer hikes to the Park as part of their Leisure programs.

Interpretive information will continue to be developed to support these programs.

To supplement these programs, and to help inform the seasoned users as well as new visitors to the Park, the RDN and NALT should also consider developing a self-guided tour along the trail network. To minimize intrusions on the natural character of the Park, as well as to minimize opportunities for vandalism, the tour could use numbered posts or rocks coupled with brochures, made available in a pick-up/return-it box at trailheads, with explanations corresponding to the numbered sites. This information tool is very adaptable; as the Park changes or items for interpretation change, it is simple to either move the numbered posts and/or reprint new brochures.

Action 16.1: *Develop and build a pilot self-guided tour on a portion of the trail network; monitor its use and effectiveness in conveying information.*

Using guided hikes or a self-guided interpretive program, potential themes for interpretation could include:

- *Natural forest succession:* Te'tuxw'tun Trail – young forest regeneration in clear-cuts to old-growth higher up the trail.
- *Fire on the mountain:* Historical information on the old fire tower as well as looking at the evidence of old fires on trees and the understorey along the trails.
- *Sensitive plant communities:* In Terrestrial Herbaceous, such as at Cougar Bluff, to educate park users on the uniqueness and fragility of the ecosystem.
- *VIU Woodlot practices:* Work with VIU to develop a program about their logging practices and urban interface forest management practices and challenges.
- *Inventory and Monitoring studies:* As they are ongoing; e.g., explaining the use of quadrants, and challenging users to find certain or a quota of plants, rocks, etc.



Interpretive map at summit

- To monitor level of use and effectiveness, the interpretive brochure could end with a simple question asking the user to rate their learning experience or the degree to which it enhanced their hike. (Remember to leave some pencils in pick-up/drop-off boxes.)

Issue 2:

Few public schools currently use the Park site due to its limited accessibility. However, Vancouver Island University (VIU) offers several programs that can be directly relevant to the management of Mount Benson Regional Park including its Bachelor of Natural Resource Protection, Resource Management Officer Technology program, Forest Resources Technology program, Bachelor of Forest Resource Management and Tourism, Recreation & Hospitality programs.

Policy 17:

The RDN and NALT will consider approaching VIU and other educational institutions and agencies to explore ways of integrating Park management activities (inventory, monitoring, restoration, etc.) into their educational and research programs. For example, RDN/NALT may wish to seek the assistance of VIU's Forestry program in planning, implementing and monitoring silviculture prescriptions arising from actions under Policy 3.

5.12 PARK STEWARDSHIP AND OPERATIONS

The RDN manages approximately 650 hectares of regional park, trail and conservation lands in the mid-Vancouver Island area. As is the case with Mount Benson Regional Park, when managing such properties the RDN is often acting in partnership with major conservation and land trust organizations or the Province.

As outlined in the RDN's Regional Parks and Trails Plan *"the RDN will continue to work with its existing community and user groups in the planning and management of regional parks and trails"* and *"will endeavour to expand these partnerships to a wider range of organizations."*

Policy 18: ●●●

The RDN and NALT will continue to work together, as well as seek assistance from other partners and the community, on the long-term stewardship of the Park.

NALT continues to run a variety of Job Creation Partnership programs at Mount Benson Regional Park. Projects that have been undertaken include trail upgrading and construction, park sign development and installation, and a habitat restoration project. However, to date, its volunteer activities have been aimed primarily at fundraising.

Policy 19: ●●●

The RDN and NALT will collaborate in finding funding and resources to establish a volunteer stewardship program for Mount Benson Regional Park that could act as the pilot for a system-wide program.

The Regional Parks and Trails Plan indicates that the RDN will work towards a volunteer program throughout the regional park system. Although volunteers can be an integral part of park management, volunteer coordination can require a substantial investment in staff time and resources to support training, supervision, equipment and liability coverage.

In Mount Benson Regional Park, the partnership with NALT provides an opportunity for both parties to gain experience in establishing a formal volunteer program, and for the Park to benefit from a variety of volunteer activities including park monitors, naturalists, trail maintenance and invasive species removal.

Policy 20: ●●●●

The RDN and NALT will respect the archaeological and cultural heritage values of the Park and the Mountain, and continue to collaborate with First Nations on park acquisition and development proposals.

In June 2009, the RDN and Snuneymuxw First Nations (SFN) approved a Protocol Agreement for partnership on land use planning and development, economic opportunities and provision of services of interest to both governments. This Agreement will help the SFN and RDN work together to preserve culturally

significant sites throughout the region. The Agreement also establishes a framework for the formation of a working group comprised of SFN leaders and RDN directors to provide the structure for communication between the two governments.

Policy 21: ●●

The RDN and NALT will seek innovative revenue-generating opportunities that are in keeping with and support the Park management goals.

Maintaining and protecting Mount Benson Regional Park will create significant demands on the RDN's tax-based funding resources. While capital facilities, restoration projects and interpretive/educational programs are often eligible for grants from senior governments and private foundations, few grants exist to help offset operational and staffing costs.

Under its Regional Parks and Trails Plan, the RDN's policy is not to charge fees for entry, parking or general use of regional parks and trails. However, fees can be considered for specific services — such as programs offered through the RDN's recreation services or permits issued to commercial tour operators.

Policy 22: ●●

The RDN will use measures identified in the RDN's Park Inspection Policy to implement risk management in the Park.

A combination of RDN staff and trained volunteers will monitor tree hazards along trails and inspect park facilities on a regular basis, particularly after storm events, to ensure that the Park is safe for public use.

5.13 FIRE SAFETY AND EMERGENCY PLANNING

The Issues:

Wild fires are a natural part of the ecological cycle of a healthy forest ecosystem. Past practices of fire suppression to protect forestry timber values and other life and property damage has exacerbated the risk of fires, disrupting the natural pattern of

frequent low-intensity fires and allowing the accumulation of natural fuels.

Due to the proximity of the urban interface and its popularity with Nanaimo and area residents, fire risk on Mount Benson is very high and can threaten the natural values of the Park, its visitors and surrounding lands.

The majority of wildfires on Vancouver Island are human-caused (Ministry of Forests and Range, 2009). It is impossible to prevent lightning from striking, but it is possible to reduce the number of people-started fires. The mountain is at risk from fire caused by illegal campfires or discarded cigarettes. Campfires are not allowed in RDN Regional Parks except in campground sites with a designated fire pit.

There were several human-caused fires on the slopes of Mount Benson in 2008. Although almost all of these started outside the Park boundaries, the risk to the Park is very high as forest fires travel uphill.

Policy 23: ●●●

The RDN will work to reduce the risk of natural and human-caused fires at Mount Benson Regional Park as part of its Fire Control Cost Sharing Agreement with the Ministry of Forests and Range.

The RDN is developing a fire management plan to meet the requirements of the Fire Control Cost Sharing Agreement that it has with the Ministry of Forests and Range for 11 of its park properties that fall outside local/community fire protection areas. Mount Benson Regional Park is one of these areas.

In June 2009, staff from the RDN and the Coastal Fire Centre conducted a fire hazard assessment, using a standard 'Interface Community Fire Hazard Analysis' that provides a quantitative method for assessing the interface fire hazard. Over 25 risk factors – such as fuel types, potential fire behaviour, susceptibility to ignition, suppression constraints, fire history, type of development, access, tenure, developed recreation sites, watersheds, wildlife habitat, and cultural features – are rated and assigned point values based on the level of risk. The analysis found that although the overall fire risk is moderate, the risk of human-caused fires in the



Campfire remains in the Park.

Park is extreme. Measures to mitigate the high fuel load are required, particularly in the logged areas.

While the RDN has the primary role for fire management in the Park, NALT can assist with public education, signage and monitoring.

***Action 23.1:** As part of the RDN's Fire Control Cost Sharing Agreement, prepare and implement a fire management plan for the Park that includes fire-smart planning, education and awareness opportunities and identifies hazard reduction priorities and actions.*

***Action 23.2:** Include information about the destructive aspects of campfires and discarded cigarettes and contacts for reporting campfires or wildfires, as part of the signage strategy.*

Policy 24: ●●

The RDN will coordinate emergency responses with local and provincial agencies.

The RDN will work with local agencies (e.g. RCMP and Nanaimo Search & Rescue) to ensure continued access and other requirements for emergency response.

Members of Nanaimo Search & Rescue, particularly those using motorized vehicles, may apply for a Park Use Permit to allow for special training sessions in the Park. This is to ensure that should a response be needed, they know the routes and are able to respond quickly in an emergency.

5.14 FUTURE ACQUISITIONS

The Issue:

There were numerous comments in the Park survey related to future acquisitions. The public was particularly in favour of increasing the forested area under protection and having publicly-owned trail access and routes that could be signed and maintained.

Policy 25: ●●●●

The RDN will consider strategic acquisitions that enhance the recreational components, including access, and aesthetic qualities of Mount Benson Regional Park.

Action 25.1: Continue discussions and negotiations with neighbouring property owners for acquiring — through purchase, donation or a combination of these measures — key additions to the Park that would secure trail use and recreational features, and/or protect significant habitats and environmental features.

Action 25.2: Apply to the Province for a Nominal Rent Tenure under the Community and Institutional Land Use program for the west summit Crown parcel.

This program is designed to support community, social and economic goals of the Province of BC by making parcels of Crown land available for community and institutional uses. Nominal rent tenures are issued for public facilities, parks and other community infrastructure.

Action 25.3: Approach the current owner of the east summit property to secure an agreement for first right of refusal on the sale of the property.



6.0 SUMMARY OF POLICIES AND ACTIONS

TOPIC	POLICY	ACTIONS	2010	2011	2012	2013	2014	2015+
Balancing Conservation and Recreation	1. Park use zones will be established to effectively manage Mount Benson Regional Park for both conservation and recreation.							
	2. The RDN and NALT will work with partners to inventory, monitor and restore the natural ecosystems and wildlife habitats found within Mount Benson Regional Park.	2.1: Complete ground verification of SEI polygons and SEI-equivalent sites; survey the remainder of the Park not covered in previous inventories for environmentally sensitive features.						
Protecting Environmental Values		2.2: Establish and operationalize an environmental monitoring program; review after 5 years.			Estab-lish	Imple-ment		
		2.3: Establish a process for measuring and monitoring the impacts of human use on the Park's environment.						
		2.4: Continue to identify projects and pursue funding opportunities to restore and/or enhance the biodiversity and sensitive ecosystems of the Park.						
		3.1 Based on the report in Addendum 1, complete and implement a more detailed silviculture plan/prescription for the logged portions of the Park, with assistance from a Registered Professional Forester as needed, that: <ul style="list-style-type: none"> • Identifies and prioritizes sites to be actively reforested; • Specifies species mixes and densities for each reforestation site; • Identifies landings and trail edges to be grass seeded, and the seed mixes to be used along with supplemental tree planting; • Sets out seasonal timeframes for replanting activities; 	Adopt plan	Imple-ment				
Forestry Resources	3. In general, forest management in the Park will be guided by the report "Mount Benson Regional Park – Review of Natural Values – Forestry", attached as Addendum 1 to this Plan.							

TOPIC	POLICY	ACTIONS	2010	2011	2012	2013	2014	2015+
		<ul style="list-style-type: none"> Establishes a program for monitoring replanting success; and Identifies roles and responsibilities for each activity. 						
	4. Other than hazard tree management and fire protection as needed, no active management activities will be pursued in the existing forested areas in the Park.	4.1 Identify a strategy, including roles and responsibilities, for monitoring and addressing tree hazards along the Park's trail system; include a method for allowing trail users to report downed trees, hazards, etc.						
Mineral Resources	5. The RDN will work to ensure no mineral claims are held on the Park property.	5.1: Negotiate with the current mineral claim holder to remove the existing mineral claim in Mount Benson Regional Park.						
Park Accesses	6. The RDN will work with neighbouring landowners to formalize main access routes to the Park, for public use as well as for park maintenance and emergency access.	6.1: Work with VIU and the Province to establish formal trail accesses to the Park from <u>Witchcraft Lake</u> and from <u>Jamesson Road</u> .						
		6.2: Complete an agreement with Island Timberlands and the City of Nanaimo to establish long-term trail access from <u>Westwood Lake</u> .						
		6.3: Work with the City of Nanaimo and the Ministry of Transportation and in consultation with local residents and the public on an appropriate location or locations for parking near the Witchcraft Lake trailhead. In partnership with the City, design and construct parking areas.						
		6.4: Work with the City of Nanaimo and neighbouring private land owners near Witchcraft Lake to resolve the existing trail routing over private property.						

TOPIC	POLICY	ACTIONS	2010	2011	2012	2013	2014	2015+
Park Accessibility	7. Public road access to Mount Benson Regional Park will not be actively pursued by the RDN during the term of this management plan. However, the RDN may consider proposals from private interests for road, gondola or other forms of access into the Park or to its boundaries, subject to rigorous assessment of: impacts on the environmental and visual integrity of the Park; socio-economic impacts in the surrounding area; and full business-case scenario planning.							
	8. Management of the Park will support a non-motorized multi-use trail network while protecting sensitive habitats and minimizing user conflicts.							
Trails Use and Management	9. Any future trail development or re-alignment will seek to avoid alteration or damage to any sensitive ecosystems, or to minimize such impacts where avoidance is not possible.	9.1: Identify trail sections near environmentally sensitive areas and take appropriate actions as needed – such as re-aligning trails, reinforcing trail surfaces, improving drainage, constructing barriers, and installing signs.						
		9.2: Assess, re-route and reinforce (as needed) the trail to Cougar Bluff, to ensure public safety and to minimize disturbance to the Bluff's sensitive vegetation.						

TOPIC	POLICY	ACTIONS	2010	2011	2012	2013	2014	2015+
	<p>10. New trails and trail upgrades within the Park will be designed and constructed to standards appropriate to the type and level of use of each trail and that aim to ensure environmental protection and public safety. Nonetheless, trails will continue to be provided on a 'use at own risk' basis.</p>	<p>10.1 <i>Develop a detailed trail plan that identifies the different types of trails – including: walking/hiking (only); mountain biking/hiking; mt biking/horseback riding/hiking trails; and trails that will be required to support vehicle access for maintenance and emergency purposes (former logging roads).</i></p> <p>10.2 <i>Develop and prioritize a complete list of trail improvements.</i></p> <p>10.3 <i>Determine the need for rehabilitating the drainage and erosion issues associated with the former logging road and commission a rehabilitation project that meets those objectives.</i></p>						
	<p>11. Pets must be under human-control at all times in the Park.</p>							
Park Information and Signage	<p>12. The RDN and NAL.T will collaborate on developing a strategic sign system within the Park that includes informational, regulatory and directional signs at key locations along the trail network.</p>							
	<p>13. The RDN and NAL.T will collaborate on communications about the Park on their respective websites and any written materials that are made available to the general public.</p>							
Visitor Facilities	<p>14. Mount Benson Regional Park will be equipped with simple day-use facilities that are in keeping with its wilderness character and that can be readily maintained by RDN staff, contractors or volunteers.</p>	<p>14.1: <i>Prioritize and construct simple use facilities at Rest Areas and Viewpoints indicated on Figure 7 of this Plan.</i></p>						

TOPIC	POLICY	ACTIONS	2010	2011	2012	2013	2014	2015+
Commercial Facilities and Activities	15. The only commercial (i.e., for profit) activities permitted in the Park will be commercial guiding and interpretive activities, and these will be only permitted subject to the provisions of a permit issued under the Park Use Regulation Bylaw. No commercial facilities (e.g., food and gift services, commercial signs, etc.) will be supported at this time.	14.2: <i>Design and construct appropriate visitor facilities at the Witchcraft Lake trailhead once access and parking issues are resolved.</i>						
	16. The RDN and NALT will develop an interpretive program that provides information about the natural and/or historical features of the Park and aids public understanding of the Park's goals and management policies.	16.1: <i>Develop and build a pilot self-guided tour on a portion of the trail network; monitor its use and effectiveness in conveying information.</i>						
Education and Interpretation	17. The RDN and NALT will consider approaching VIU and other educational institutions and agencies to explore ways of integrating Park management activities (inventory, monitoring, restoration, etc.) into their educational and research programs. For example, RDN/NALT may wish to seek the assistance of VIU's Forestry program in planning, implementing and monitoring silviculture prescriptions arising from actions under Policy 3.							

TOPIC	POLICY	ACTIONS	2010	2011	2012	2013	2014	2015+
Park Stewardship and Operations	18. The RDN and NALT will continue to work together, as well as seek assistance from other partners and the community, on the long-term stewardship of the Park.							
	19. The RDN and NALT will collaborate in finding funding and resources to establish a volunteer stewardship program for Mount Benson Regional Park that could act as the pilot for a system-wide program.							
	20. The RDN and NALT will respect the archaeological and cultural heritage values of the Park and the Mountain, and continue to collaborate with First Nations on park acquisition and development proposals.							
	21. The RDN and NALT will seek innovative revenue-generating opportunities that are in keeping with and support the Park management goals.							
Fire Safety and Emergency Planning	22. The RDN will use measures identified in the RDN's Park Inspection Policy to implement risk management in the Park.							
	23. The RDN will work to reduce the risk of natural and human-caused fires at Mount Benson Regional Park as part of its Fire Control Cost Sharing Agreement with the Ministry of Forest and Range.	<i>23.1: As part of the RDN's Fire Control Cost Sharing Agreement, prepare and implement a fire management plan for the Park that includes fire-smart planning, education and awareness opportunities and identifies hazard reduction priorities and actions.</i>						

TOPIC	POLICY	ACTIONS	2010	2011	2012	2013	2014	2015+
		23.2: <i>Include information and interpretation on the destructive aspects of campfires and discarded cigarettes and contacts for reporting campfires or wildfires as part of the signage strategy.</i>						
	24. The RDN will coordinate emergency responses with local and provincial agencies.							
Future Acquisitions	25. The RDN will consider strategic acquisitions that enhance the recreational components, including access, and aesthetic qualities of Mount Benson Regional Park.	25.1: <i>Continue discussions and negotiations with neighbouring property owners for acquiring key additions to the Park that would secure trail use and recreational features, and/or protect significant habitats and environmental features.</i>						
		25.2: <i>Apply to the Province for a Nominal Rent Tenure under the Community and Institutional Land Use program for the west summit Crown parcel.</i>						
		25.3: <i>Approach the current owner of the east summit property to secure an agreement for first right of refusal on the sale of the property.</i>						

7.0 SOURCES

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Mount Benson Regional Park – Review of Nature Values - Forestry

*A rapid field assessment of Mount
Benson Regional Park*

November 2009

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Mount Benson Regional Park – Review of Natural Values – Forestry

A rapid field assessment of the Mount Benson Regional Park area was conducted on June 19, 2009 by Len Apedaile RPF, Econ Consulting accompanied by Leigh Sifton and Harriet Rueggeberg of HB Lanarc Consulting. The purpose of the assessment was to gain an overview of existing forest resources and rehabilitation needs for inclusion in the park management plan. The primary emphasis was on recently logged areas with secondary emphasis on the existing forest cover.

Methods:

The rapid assessment was conducted on foot over a period of 6 hours and involved hiking up the Witchcraft Trail (#1), from the end of Benson View Road, through the VISU Woodlot # 20, until the old logging road. From there the assessment proceeded east along the central logging road network and visited the majority of the areas harvested in 2003 and 2004 from west to east and from lowest elevation to highest. Portions of each of these polygons were walked to ascertain the general status of natural regeneration, plantability, slash loading, and other vegetation. The condition of existing roads and drainage structures were also observed as well as the apparent status of logging trails, landings and other disturbed areas to identify any issues or rehabilitation needs.

After hiking through the harvested areas the assessment continued up the Te'tuxw'tun Trail through older second growth and old growth forest polygons to the summit. We then descended back to Benson View Road via Scramble Trail and Rafe's Way, through the westernmost harvested areas and Witchcraft Trail (#2).

Following the assessment a meeting was held with Paul Chapman and Gail Adrienne of the Nanaimo Area and Land Trust (NALT) to provide further background on the property and to discuss the preparation of a more detailed reforestation plan and recommended methods of reforestation in association with NALT's Habitat Restoration and Enhancement Crew Project.

The digital orthophoto and base map layers, (including property boundaries, forest cover polygons, roads and trails), were then used to conduct a more detailed overview assessment and net calculation of harvested areas and disturbed / non-productive areas (trails, roads, landings, rock outcrops). This data will form the basis for the reforestation plans. A telephone conversation was also held with Joe Materi of Ursus Environmental to review and discuss general observations, rehabilitation approaches and species selection for reforestation and rehabilitation of disturbed and degraded areas.

Observations:

Harvested Areas

- **Area Summary**

For reference purposes, the harvested areas are subdivided into 5 areas as shown on the attached map and in the following table:

Unit	Gross Area (ha)	Road/Trail Area (ha)	Net Area (ha)
1	1.0	0.0	1.0
2	12.0	0.6	11.4
3	4.4	0.3	4.1
4	4.8	0.1	4.7
5	6.7	0.1	6.6
total	28.9	1.1	27.8

The extent of the harvested areas, roads and logging trails were digitised to delineate and estimate the gross and net areas. Residual patches of timber within the harvested area were excluded. Non-productive road and trail areas within these polygons were estimated based on 5m average width for roads and 3m average width for trails. These areas were deducted from the gross areas to arrive at an estimated net productive land area for reforestation. Further deductions for non-productive rock outcrop areas have not been included but are assumed to account for less than 5% of the net area.

As a result, the estimated total area requiring reforestation is approximately 28ha.¹

- **Current Status**

- Site ecology and general productivity

The general ecology of the Park and the applicable biogeoclimatic zonation is described in the Assessment of Conservation Values within Mt. Benson Regional Park (2006). The harvested areas occur within the transition between two variants of the Coastal Western Hemlock (CWH) biogeoclimatic zone. These are the very dry maritime coastal variant

¹ This is less than the estimate of 64 hectares (51.2ha logged in 2003 + 13.0ha logged in 2004) quoted in the September 2003 and May 2005 Timber Appraisal reports. It is assumed that these estimates broadly estimated the overall extent of the area subjected to logging development whereas the current numbers are based on actual area disturbed and requiring reforestation and excludes areas that were partially or selectively logged and have remaining forest cover.

(CWHxm2) which occurs below 700m elevation, and the montane moist maritime variant (CWHmm2).

The observed site series, which describe the general soil moisture and nutrient regime, were pre-dominantly zonal - 01 (semi dry – poor to medium sites) and expressions of the drier 03 (moderately dry – poor) site series. The predominant 01 sites are indicated by shallow to moderately deep soils and well established vegetation normally dominated by fireweed. The 03 sites occur on steeper areas with shallow soils, usually in the vicinity of rock outcrops and indicated by sparser vegetation cover usually dominated by salal.

The aspect of the harvested areas ranges from N in the western reaches (Unit1) to NE in the lower and eastern reaches (Unit 3 & 5). This northerly aspect tends to moderate the moisture regime of the site and create truly transitional conditions between the two zones.

These characteristics are described because they have a bearing on species selection and reforestation.

The following table summarises the elevation range, biogeoclimatic zone and predominant site series observed during the field review.

Unit	Elevation Range	Biogeoclimatic Zone	General Site Series
1	700-760m	CWHmm2	01
2	680-720m	CWHxm2 – CWHmm2	01 (03) (06t)
3	520-640m	CWHxm2	01 (03)
4	720-820m	CWHmm2	01 (03)
5	620-760m	CWHxm2 – CWHmm2	01, 03

o Stocking and Species

The walk through of a sample of the disturbed areas has indicated that the disturbed areas remain NSR (not sufficiently restocked) 5 -6 years after logging.

Despite this prognosis, there does exist varying amounts of naturally regenerated and established but sparsely distributed tree species throughout the harvested areas. These include: red alder (Dr), red cedar (Cw), douglas fir (Fd), western hemlock (Hw), shore pine (Pl) and western white pine (Pw).

With the exception of some localised concentrations of red alder, it is estimated that current stocking levels vary between 100 -200 stems per hectare (sph) overall.

Varying amounts of germinants were also noted along roadsides and disturbed soils. Most of these are unlikely to survive dry summer conditions. Recent dry summers since logging have likely contributed to lower survival rates of germinants and natural restocking.

The current stocking is in contrast to the adjacent densely overstocked 51 year old stands that were the focus of the harvesting in 2003 and 2004. These stands were naturally regenerated following fire and are heavily stocked.

○ Other Vegetation

The disturbed areas are also covered to varying degrees of distribution and density with a diversity of other plant species including but not limited to fireweed, bracken fern, huckleberry spp, salal, trailing blackberry and grasses. As indicated above there are also isolated small patches of moderate to densely stocked red alder.

Despite the 5-6 years since logging, the extent of the brush layer, with very few localised exceptions, is not expected to pose a significant risk to the further establishment of tree species on the sites by planting (if larger two year old quality stock are used). It will however likely continue to limit natural regeneration through light and moisture competition and seedbed limitations.

○ Slash Loading and Plantability

Due to the high density and age of the harvested stands, it is evident that moderate to heavy slash accumulations remained in many parts of the area. Roadside accumulations have been piled and burned consequently roadsides and landings are quite clean. Low to moderate accumulations consisting of tops, branches and understory material remain scattered throughout the harvested areas. The remaining slash has begun to settle due to the age of material and does not present a significant impediment to reforestation.

With the exception of areas of exceptionally shallow soils around rock outcrops, much of the site appears to exhibit readily plantable, shallow to moderately deep soils. This was not shovel tested and a further plantability survey is recommended.

To summarise, the site conditions are representative of an average coastal second growth logged site and is readily plantable. Moderate effort will be

required in areas with steep slopes, localised slash accumulations and well established vegetation cover.

- Fire Hazard

A fire hazard assessment was recently conducted on the site by Ministry of Forests staff. While the disposal by roadside slash by piling and burning has abated the fire hazard somewhat, the regular public access along roads and hiking trails combined with dry vegetation in the late summer and moderate in block slash accumulations indicate that until the harvested areas are further regenerated that a degree of fire hazard will remain.

- **Reforestation Options**

- Reforestation / Rehabilitation Objectives

The reforestation and rehabilitation of the harvested areas within the Park is an inherent goal of the Regional Park Plan. This general objective includes restoration and maintenance of a natural range of forest cover attributes (including tree species and plant communities, age class, density, stand structure and habitat values).

A reforestation plan to achieve this objective should be guided by the following specific objectives and considerations:

- objectives for future forest cover (species composition, function*)
- timeframe to achieve desired state & functional characteristics.
- cost of reforestation and stand management
- priority areas (ie trail corridors, visible areas)

*functional objectives include ecological function and amenity functions such as visual quality and recreation.

Discussion with HB Lanarc staff, NALT staff and with Ursus Environmental suggested that:

- Reforestation should aim to achieve more open and irregular stands (lower stocking) within the harvested areas to enhance forest cover and habitat diversity within the Park. This would be in contrast to the dense second growth stands surrounding the harvested areas. This would include open areas dominated by native brush species that would be subject to slower and more gradual natural reforestation processes.
- Reforestation should strive to include the full diversity of naturally occurring and ecologically appropriate conifer and deciduous species. Reforestation should not be delayed any longer.
- Long term objectives are to achieve a stable, mature seral stage with a diversity of structural attributes and natural successional processes occurring across the range of site / forest cover types.

- Resources are expected to be limited implying that long term objectives will need to be achieved with a minimum of investment in forest stand management interventions beyond initial reforestation to establish the make up and stocking pattern of the future stands.
- Initial priorities should focus on corridors along existing recreation trails to accelerate the visual recovery of adjacent harvested areas. Priorities should also be given to revegetating, restoring and stabilizing soils and areas most heavily impacted by logging activities. These include roadside landing areas and areas of exposed/compacted soil along extraction trails.

With these in mind, three general reforestation options (or strategies) were discussed during the field review. Other than the cost of planting all three assume that due to funding limitations few or no resources will be available for brushing treatments or other stand tending activities. Reforestation therefore becomes the key opportunity with respect to achieving future objectives.

- Option 1: Continue with natural regeneration:
This is a status quo option that will allow the natural process of regeneration to take place over time as existing stocking grows up and new trees seed in and become established. This option will prolong the current brush stage and visual recovery of the site by another 15 – 20 years and result in a more open and variably stocked stands in the medium term and more open partly uneven aged stands in the long term.
- Option 2: Supplemental / partial artificial reforestation:
This option prescribes a mix of planting and natural regeneration with planting taking place in targeted and priority areas such as along hiking trails where quicker greenup may be desired. Other targeted areas would include areas requiring rehabilitation or areas where natural regeneration is expected to be slower due to brush competition or slash loading. This option also allows the areas to be gradually planted in phases according to the availability of funding.

The supplemental nature of this option also implies lower planting densities to take full advantage of establishing natural regeneration.

- Option 3: Aggressive – full artificial reforestation.
This option involves planting conifer species to BC Chief Forester stocking standards (800-900sph) with the purpose of achieving full stocking of the site and stand establishment as quickly as possible.

This option will create an even aged stand with a specified species composition. Following the CHWmm2 stocking standards provide more flexibility and diversity of conifer species choice while CWHxm2 regimes involve planting predominantly Fd.

Based on the objectives discussed above, Option 2 is recommended as the preferred reforestation strategy, providing maximum flexibility from a timing and cost perspective and for achieving short, medium and long term goals.

This reforestation strategy will be further developed in a separate, detailed silviculture plan under preparation for NALT. The plan will incorporate the following considerations with respect to species composition and stocking.

- Species composition
Species options are determined by ecological suitability. A range of conifer and deciduous species are considered ecologically suitable on these sites. Depending on specific site attributes, these include: Fd, Hw, Hm, Cw, Yc, Hm, Pl, Pw, Ba, Dr, (Mb), (Act). Planting a range of species will create an ecologically and structurally diverse forest cover.

The future forest cover will be mainly dominated by coniferous species; however, areas currently dominated by red alder will be allowed to develop into moderately dense alder stands in the interim. Over time, it is anticipated that these alder stands will gradually be replaced by shade tolerant understory Cw, Hw and Ba.

Specific species will also be prescribed for use in areas requiring rehabilitation such as old landings and skid trails. This may also be accompanied with targeted revegetation seeding to help accelerate or improve soil organic matter or reduce erosion potential.

- Density (stocking)
Artificial reforestation provides opportunities for density management, including stocking density as well as distribution or uniformity. The surrounding stands as a result of the fire history are excessively dense. While it would be possible to emulate this through higher planting densities, it has been suggested by Joe Materi that managing the disturbed areas to lower densities and more open distribution, including the retention of areas of brush species with little or no stocking, would create an ecologically and

structurally diverse area within the park that would contribute to overall ecological restoration.

- **Roads, trails and landings status**

Roads and ‘permanent’ trail lengths were estimated from the orthophoto.

Road Name	Total Length (m)	Road Name	Total Length (m)
Rd 1	1581	Tr 1	51
Rd 2	362	Tr 21	176
Rd 3	1055	Tr 22	77
Rd 4	803	Tr 31	257
Rd 5	689	Tr 32	101
Rd 6	903	Tr 5	281
Total (roads + trails)			6336

The density of roads and temporary trails within harvested areas is relatively high in comparison to the area logged, and is a consequence of the harvesting system and long narrow configuration of many of the cut areas. Many of the temporary machine trails within the harvested areas have caused some degree of soil disturbance and degradation that will persist through the next rotation. However, these areas will restock over time and gradually disappear as the canopy closes.

The rapid field assessment looked at general road and harvest trail conditions and for any specific problems that were evident. Generally, the main roads are in good condition with most of the road system located on relatively flat grades on natural benches. The road system in general is considered to be stable and requiring no special management.

The exception is a section of *Road # 3* located in a climbing section between *Unit 3* (at the entrance to the harvesting complex) and *Unit 2*. This steep section (~300m @ est 12-18%) was constructed within a narrow, confined, natural draw that contains a seasonal stream. During periods of high runoff (fall/winter rains and spring snowmelt), water runs down sections of the road surface and established ditch and is resulting in erosion and degradation of parts of the road surface and deepening/widening of parts of the ditch.

The ditch and a culvert at the bottom of this section have been completely blocked by sediment deposition and consequently the ditch water is diverted onto the road and flows along a heavily eroded surface for 20-30m before cascading over the lower side of the road bank, into the cutover. The repair of this particular problem is a drainage management priority. If not repaired, it will eventually wash out the road below the blocked culvert and block access into the rest of the road system. It is estimated that the problem could be relatively easily managed and corrected in about 1-2 day's work with an excavator and should involve:

- walking a machine up from the entrance of unit 3

- removing the blocked culvert and installing a well armoured cross ditch to move the water across the road while continuing to allow light vehicle access,
- armouring sections of the ditch along the length of the section above the culvert to prevent further erosion and ensure that the water is properly channelled. Managing water velocity through the installation of ditch blocks or weirs is also recommended but it should be noted that these will require periodic maintenance to manage sedimentation build up such that the ditch does not fill up and spill water back onto the road surface.

After, the water eventually returns to the natural downstream portion of the same stream which runs through the length of Unit 3 . Sections of the streambed within Unit 3 have also been disturbed by logging access trail construction resulting in bank destabilisation, active erosion and ongoing sediment transport. Natural revegetation is occurring in these areas and it is expected that this will eventually naturally stabilise. Some remedial work by hand may be considered should resources permit; however, further assessment is required. Machine remediation is not recommended.

- Landing and access trail rehabilitation options (grass seeding / planting)
Several landings have been partially rehabilitated through decompaction and distribution of large woody debris. There are also several areas along roadsides and at trail junctions where there has been significant soil disturbance. In both cases these areas of disturbed soil, despite the landing treatment , have yet to see any revegetation. These areas should be considered for remedial revegetation with a mix of grass and legume species as well as planted with tolerant conifers including Cw and Pl. It is suggested that a quick growing revegetation treatment such as fall rye be applied to create a quick green up and then a resulting mat of straw that will foster soil development processes and the establishment of native grasses and legumes that could be over seeded into the rye straw. Because the rye is not persistent (does not seed) it presents little danger of environmental contamination.

Existing Forest Cover

General Management Considerations

The rapid assessment did not identify any specific management issues associated with the existing forest cover stands other than ongoing fire protection and safety.

The existing forest cover that dominates the majority of the Park area is described in the Timber Appraisal (DRFS 2003) and is categorised into types. These include recently logged areas, the 50 year old fire origin stands, remnant pockets of old growth forest and open forest areas associated with the dry rocky outcrops.

The old growth areas provide some spectacular examples of structurally diverse coastal forest including large Cw, Fd and Hw trees. The younger dense fire origin stands that make up a majority of the Park, show signs that despite their understory density that a dominant over story is being expressed and will continue to develop and diversify over time re-creating future old growth characteristics in the long term. Evidence of active natural thinning processes were noted in these stands including significant pockets of snow press that had effectively removed the majority of the intermediate layer.

Consequently no specific ongoing management interventions are contemplated to manage and or maintain the existing forest stands.

Considering the nature of the park and park activities , protection activities should focus on user education and fire hazard notification. Response to any fire incidents will likely rely on external agencies. Protection initiatives and contingencies should be considered in the overall management plan.

From a safety perspective ongoing attention to hazard trees and maintenance along hiking trails will be required and may involve the occasional felling of trees that present a danger. Attention should be given to locations (such as viewpoints, water features or interesting forest features) where people tend to stop, congregate or camp.

Summary

The forest resources within Mount Benson Regional Park are generally in good condition. Priority should be given to the reforestation of recently logged areas, the rehabilitation of disturbed soils, and the maintenance and rehabilitation of road and trail sections that are located within natural drainages. A variety of reforestation options exist for harvested areas depending on objectives and available resources.

The management of existing stands should continue to rely on natural stand development processes. Fire protection/education of recreational users and the management of safety hazards along trails and high use areas should continue.

Reference documentation:

A Proposal for the Regional District of Nanaimo. Consultant Services: Management Plan for Mount Benson Regional Park. H.B. Lanarc Consultants Ltd. Jan 2009.

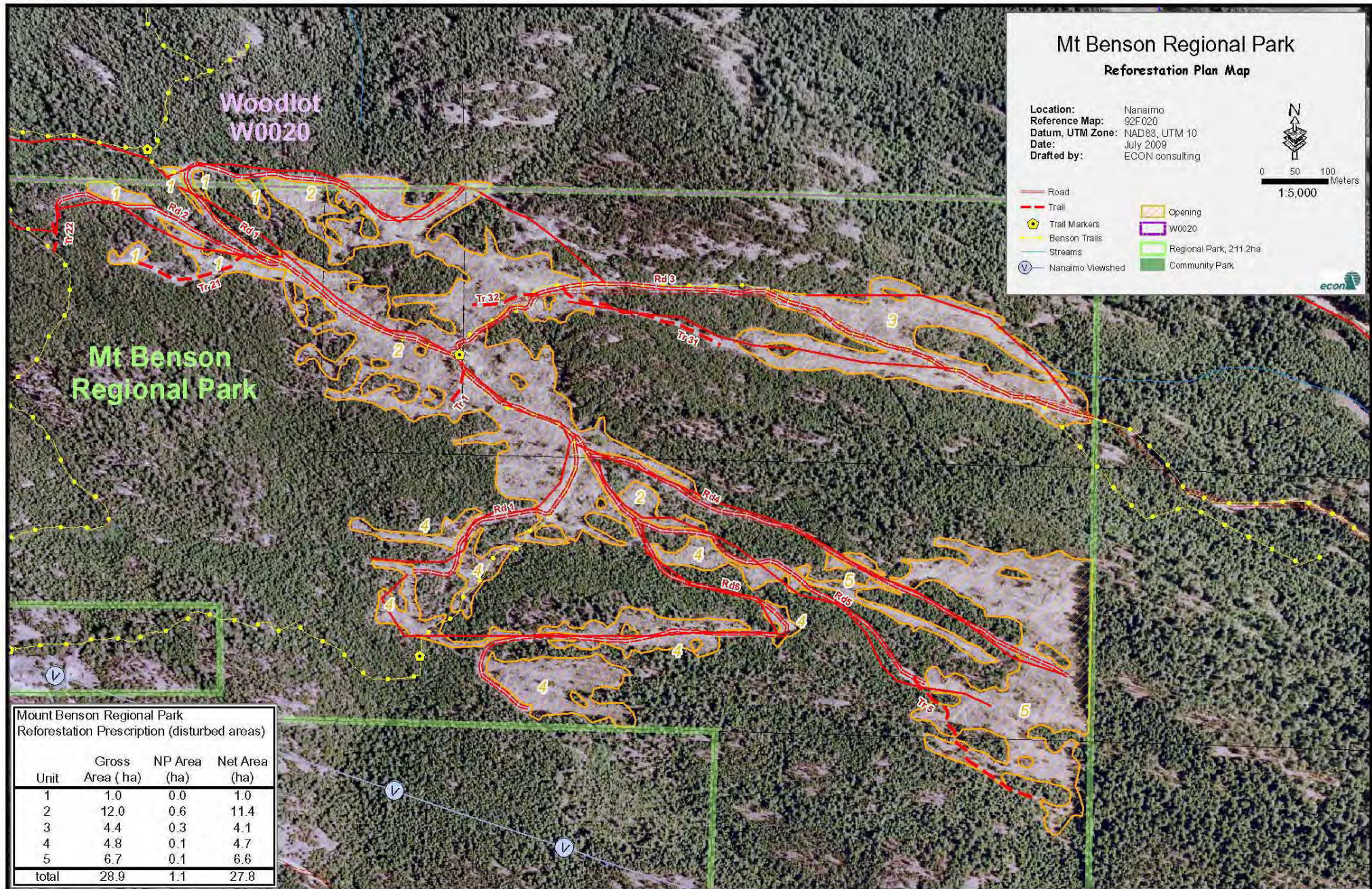
Assessment of Conservation Values within Mount Benson Regional Park, Nanaimo. Joe Materi, Ursus Environmental, September 27, 2006

Timber Appraisal of Mt Benson Properties Section 7, Block 787, and Block 1161 Nanaimo, B.C., David Robinson Forestry Services, September 30, 2003

Revised Timber Appraisal of Mt Benson Properties. Section 7, Block 787, and Block 1161 Nanaimo, B.C. David Robinson Forestry Services, May 7, 2005

JCP Proposal for : NALT Habitat Restoration and Enhancement Crew Project

Mount Benson Regional Park Management Plan, Review of Natural Values – Forestry, June 19, 2009



Schedule “C”

The Baseline Documentation Overview and Report Including Park Map

Table of Contents

1. Baseline Documentation Overview
2. Report
 - a. *Assessment of Conservation Values within Mt. Benson Regional Park, Nanaimo*
 - b. *Mount Benson Regional Park- Review of Nature Values- Forestry*
 - c. *Chapter 3 of Mount Benson Regional Park 2010-2020 Management Plan*
 - d. Park Map

Baseline Documentation Overview

1. LOCATION AND DESCRIPTION

Mount Benson Regional Park, hereafter referred to as the Covenant Area, is located just west of the City of Nanaimo. The Covenant Area covers 212 hectares (523 acres) of land on the upper north east slope of Mt. Benson, lying between the 457 m (1,500 foot) and 1,006 m (3,300 foot) elevations.

It is located in Electoral Area C of the Regional District of Nanaimo (RDN).

The Covenant Area covers the entire area of Mount Benson Regional Park, legally described as:

PID: 000-010-294, Block 1161, Mountain District;

PID: 000-010-286, East 10 Chains of Section 7, Range 3, Mountain District;

PID: 000-013-340, Section 7, Range 4, Mountain District; and

PID: 000-101-278, Block 787, Mountain District, Except Part Shown Outlined in Red on Plan 2334 RW and Except Part on Plan 28907 and VIP75642.

(the “Lands”)

2. SITE HISTORY

Mount Benson, known as Te’tuxw’tun, is a sacred site of the Snuneymuxw First Nation and was an important area for Snuneymuxw ancestors to hunt and gather food. The mountain is named after Dr. Alfred Robson Benson, a physician who served with the Hudson’s Bay Company from 1857 to 1862 and then with the Vancouver Coal Company.

The slopes of Mount Benson have a long tradition of use by area residents and visitors. The Times Colonist (a Victoria, B.C. newspaper) reported tales of hikes in 1913. Other historical accounts show that there was an annual ritual for area school children to climb Mount Benson on Easter Break as part of school recreation programs.

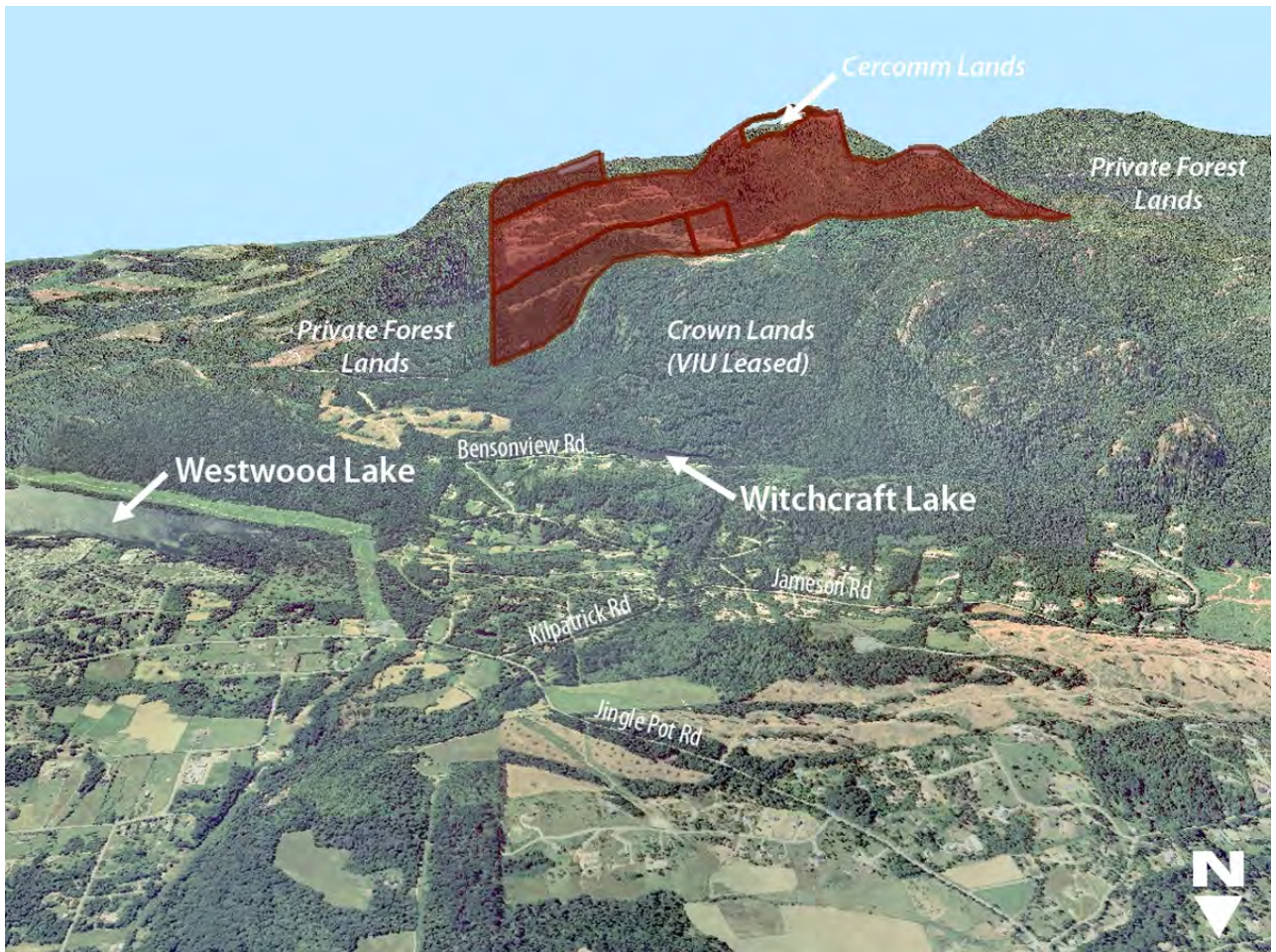


Figure 1: The four parcels of Mount Benson Regional Park, the “Covenant Area”, are shaded red.

The west summit (not in the Covenant Area) housed a fire lookout station from 1925 to the mid 1960s. The road to the fire lookout station, which passes through the Covenant Area, was improved in 1927 which triggered the summit becoming an attraction to local citizens and tourists for family picnics, weddings, family outings and to visit the fire lookout.

Past logging activities (1800s to 2004), and major fires (early 1920s and 1951) have shaped the forested slopes of Mount Benson. The Covenant Area itself is surrounded by private, managed forest along with Crown land managed under a Woodlot License. In 2003 and 2004, about 64 hectares of the eastern portion of the Covenant Area property were logged by the previous owner, leaving several clear cut areas and a network of logging roads. The major slash piles were burned in 2008.

There are no public roads to the Lands. Two private logging road networks lead from Nanaimo Lakes Road to the east and south boundaries of the Park. An old fire tower road led to the summit of Mount Benson in the 1950s-1960s.

The Island Timberlands road to the east boundary was extended by the previous owner into the property to facilitate the 2003-2004 logging. However, the roads within the Covenant Area have since been decommissioned and are very rough. Permission for emergency and servicing access to the Covenant Area boundary via these private roads can be obtained for authorized personnel.

Various trails have been constructed informally over the years, many based on pre-existing logging roads and others built to interconnect between these main trails. The mountain trails are used by a variety of outdoor recreation enthusiasts – including hikers, mountain bikers, horseback riders,

All-Terrain-Vehicle (ATV) users, snowmobilers and climbers. There has also been some wilderness camping, both summer and winter. NALT, and occasionally the RDN and City of Nanaimo, take guided hikes to the summit of Mount Benson.

Summer students from Malaspina University-College's (now Vancouver Island University) biology department assisted with site inventories in 2003 and 2004, but there are no known regular and ongoing university or school programs using the Covenant Area (*Mount Benson Regional Park 2010-2020 Management Plan, 2009*).

3. LIST OF BUILDINGS, STRUCTURES AND OTHER IMPROVEMENTS

3.1 Buildings or Structures:

"Waterbar" stairs have been built on Te'tuxw'tun Trail in the Natural Environment Zone for ease of access up a steep incline.

Trailhead maps mounted on posts in the Natural Environment Zone are located : at the confluence of the Old Road Trail and the logging road that is an access route from Westwood Lake; at the lower end of the Te'tuxw'tun Trail and at either end of where the trail was repositioned; where Rafe's Way and the Straight to the Top trail meet and where Rafe's meets Gordie's Trail and at a mid-point along Gordie's Trail before it meets Rafe's; an interpretive sign at a small wetland area near the Te'tuxw'tun Trail; and another along a decommissioned logging road spur.

3.2 Other improvements:

Trails within the Covenant Area are gradually being improved, and dangerous and/or eroding trails have been blocked from further use.

The Te'tuxw'tun Trail was repositioned away from following a seasonal streambed. Plantings of native grasses, shrubs and trees were done to discourage transit and prevent erosion. A portion of Rafe's way was repositioned and marked to avoid an area requiring a rope-assistance feature.

Several areas were planted with trees to augment natural regeneration where it lagged, and a significant portion of a logging road spur was decommissioned by the placement of large woody debris and seeding with native grasses suited for reclamation of old logging roads (entrance to the spur road is at a point along the Old Road just east of where it is met by the Witchcraft Lake Regional Trail).

The RDN and NALT have erected some directional signs at Covenant Area /Park boundaries and major trail junctions and several of the major trails have been 'blazed'. Interpretive signage in the Covenant Area is a sign at a small wetland area near Te'tuxw'tun Trail, and another along a decommissioned logging road spur.

4. SIGNIFICANCE OF LANDS AND AMENITIES

Mount Benson provides a natural backdrop to Nanaimo and an outdoor recreational playground for area residents and visitors alike. The mountain provides stunning views from the peak and upper elevations to Nanaimo, the Strait of Georgia and Mainland on the north and east, with a mountain panorama into the central Vancouver Island highland mountains to the south and west.

Valued Ecosystem Components (VECs), defined as "any part of the environment that is considered important by the proponent, public, scientists and government involved in the assessment process" (Canadian Environmental Assessment Agency <<http://www.ceaa-acee.gc.ca> >) have been identified and rated for the Covenant Area/Park. Nine VECs have been identified and rated in the Covenant Area (Table 1). The overall conservation value of the Covenant Area is high, with individual VECs rated as moderate to high.

Species lists compiled for the Covenant Area, despite incomplete inventory efforts, indicate that it possess considerable floral, faunal and fungal biodiversity. It supports 117 vascular plant species, 84 vertebrate species and at least 33 species of fungi. As of 2006, the plant list for the Covenant Area includes 12 trees species, 27 shrub species, and 78 species of non-woody plants (herbs and ferns) (*Ursus Environmental, 2006*).

Table 1: Valued Ecosystem Components identified in the Covenant Area (Ursus Environmental, 2006)

Valued Ecosystem Component	Regional Importance Rating	Rating Rationale
1. Vascular plant diversity	High	117 species recorded to date
2. Rare/ uncommon plants	Moderate-high	2 Blue-listed species (current/historical); 2 locally uncommon species
3. Fungal diversity	High	> 30 species recorded, many depend on stable older forest habitat
4. Rare/uncommon fungi	Moderate	1 species considered rare
5. Vertebrate diversity	High	At least 75 bird, 6 mammal, 3 amphibian species
6. Rare/uncommon vertebrates	Moderate-high	1 red-listed, 1 blue-listed, 6 locally rare bird species; potentially 1 federally-designated at-risk amphibian.
7. Ecosystem representation	Moderate	Spans 2 biogeoclimatic variants, contains unusual 'transition zone' features; 2 blue-listed forest ecosystems.
8. Sensitive ecosystem presence	High	16 ground-checked SEI polygons
9. Habitat connectivity	High	Provides elevation and wetland-to-upland corridors for wildlife
Overall Conservation Value	High	

Given the long history of logging in the region, all Older Forest polygons have considerable conservation value in providing structural habitat elements, such as cavity-bearing snags and large recumbent logs, which are generally in short supply in southeastern Vancouver Island.

5. INVENTORY OF BIOLOGICAL FEATURES

5.1 Biogeoclimatic Zones

Mount Benson Regional Covenant Area encompasses two variants of the Coastal Western Hemlock (CWH) biogeoclimatic zone: the Very Dry Maritime Coastal Variant (CWHHxm2) below 700m elevation and the Montane Moist Maritime Variant (CWHmm2) from 700m elevation to the summit. The CWH zone has the greatest diversity and abundance of habitat elements of all biogeoclimatic zones in the province (Pojar, 1991).

5.2 Sensitive Ecosystems

Sensitive forested, non-forested and wetland ecosystems occur within the Park. Although it includes large areas disturbed by logging and wildfire, it rates high in the Valued Ecosystem Component assessment of conservation values. Using the Sensitive Ecosystem Inventory (SEI) criteria, 5 Older Forest polygons, 9 Terrestrial Herbaceous polygons, 1 Wetlands-bog, and at least 1 Sparsely Vegetated polygon, have been identified in the lands of the Covenant Area (*Ward, et al., 1998*; and *Ursus Environmental, 2006*).

In the Older Forest: HwBa -Pipecleaner Moss Community within the Park, conifer-dominated stands are generally 6 ha or less and widely dispersed. Mature stands feature western hemlock and Douglas fir trees, some exceeding 80 cm diameter. The Older Forest: HwCw- Salal Community is restricted to a single stand in the northwestern part of the Park. The forest canopy is dominated by large-diameter hemlock trees (to 70 cm). The only Older Forest Ecosystem occurring within the Coastal Western Hemlock Montane Moist Maritime Variant (CWHmm2) is a remnant of Older Forest: FdHw- Salal Community in the moderately steep east-central part of the Park. It is comprised of well-spaced Douglas fir trees, with the largest having diameters of nearly 60 cm.

A number of Terrestrial Herbaceous communities were identified in the northeast and south-central parts of the Covenant Area in 1997, some of which were disturbed by logging in 2003-04. Several new units were located in the central and southeastern parts of the site in 2006.

A single Wetlands-Bog ecosystem occurs in the northwest part of the Park, covering about 0.5 ha. Several characteristic plants are Labrador tea, bog-rosemary, and sundew.

Sparsely Vegetated sensitive ecosystems are referred to as inland cliffs. A new unit was identified in 2006 in the central part of the site, along the southern Covenant Area boundary. Typically these areas support a few grasses and dry-adapted wildflowers (*Ursus Environmental, 2006*).

5.3 Non-Sensitive Plant Communities

Logged over areas (approximately 64 ha) are concentrated in the east-central and north-central parts of the Park. They currently support a mix of native herb/shrub and weedy introduced forbs and grasses.

Early Seral HwFd-Kindbergia Communities form the most extensive cover within the Park, characterized by small-diameter trees with high canopy closure which has suppressed native understory vegetation. Douglas fir is the dominant tree, and often the only tree other than shore pine in old burned areas. A minor component of western red cedar and western white pine occur in areas that escaped wildfire.

Pure stands of shore pine and mixed stands of shore pine and Douglas fir are restricted to dry ridge and hill crests with shallow soils in the southeastern and southwestern parts of the Park.

Tree diameters rarely exceed 30 cm, and the canopy is open to semi-open. Salal typically forms a dense cover in the understory.

Mid-seral FdPI-Cladina Community is restricted to a single pocket in the northeast part of the Covenant Area (*Ursus Environmental, 2006*).

5.4 **Hydrology and Wildlife**

While no permanently flowing streams occur within the Park, parts of the Covenant Area form the headwaters of McGarrigle, McNeil and Benson Creeks that flow down its north slopes to Witchcraft Lake, Westwood Lake and the Millstone River. The east slope drains into the Chase River system.

These aquatic systems form the basis for a network of wildlife corridors on the mountain and its surrounding areas. Several large species are known to use or travel through the region, including cougars, black bears and Columbian black tailed deer. In addition, a variety of small mammals including marten, Red squirrel and Deer mouse, have been recorded in or near the study area (*Ursus Environmental, 2006*).

More than 75 bird species have been recorded in or near the Park. Fifty-two species are known to breed locally, eight others likely only over-winter in the region, and two species are normally only present during fall migration. Several others occur very infrequently (*Ursus Environmental, 2006*).

Amphibians noted include Western toad, Pacific tree frog and Northwestern salamander.

5.5 **More Detailed Inventory**

The Ursus Environmental report 2006, "*Assessment of Conservation Values Within Mt. Benson Regional Park, Nanaimo*"; and the Econ Consulting report 2009, "*Mount Benson Regional Park- review of Natural Values- Forestry*" give a more complete inventory of biological features and assessment of conservation values for the Mount Benson Regional Park ("the Lands").

6. **POTENTIAL RISKS TO COVENANT AREA**

6.1 **Cercomm Easement**

Cercomm Electronics holds an *easement* over the Covenant Area lands that grants Cercomm the right to construct, install and maintain an access road and poles, wires, conduit and other apparatus for the supply of electrical power. In doing so, Cercomm is obliged to use reasonable efforts to minimize the footprint of such construction within the Park. Once permanent elements are constructed, the easement will be modified to include only the built areas.

6.2 **Fire Hazard**

Public access along roads and hiking trails combined with dry vegetation and remaining slash cover present a fire hazard in mid- to late summer.

6.3 **Erosion in logging areas and due to off-trail use**

The 64 ha area that was logged in 2003-2004 needs to be more intensively managed to re-instate a natural forest system, stabilize soils and reduce the potential fire hazard.

Most of the logging roads in the disturbed areas are considered stable and require no special management. The exception is one steep section of Road #3, about 150 m below (east of) the intersection of Roads 1, 3 and 4 (see Addendum 1 map), which was constructed through a natural drainage bed and which now is subject to active erosion and bed transport (*Mt. Benson Regional Park 2010-2020 Management Plan. 2009*).

Due to the steep, rocky terrain, poor drainage and increasing level of use, portions of trails within the Covenant Area are in poor condition. Off-trail use, particularly by mountain bikes and especially in steep areas and across stream beds, can exacerbate erosion problems.

6.4 **Mineral Claim**

There is one sub-surface mineral claim in the Covenant Area. Under the *Mineral Tenure Act* (RSBC 1996), an individual secured a sub-surface mineral claim, Cell Claim Tenure (510914) prior to the designation of the Covenant Area and thus takes precedence and is not subject to Section 21 of the Act. Thus, the tenure owner may conduct exploration and development activity within the Park. In order to proceed, the tenure owner is required to serve notice to the Owner under Section 19 of the Act. The Owner cannot prohibit entry but is entitled to compensation for loss or damage caused by the entry (*Mt. Benson Regional Park 2010-2020 Management Plan. 2009, p. 21*).

7. **MAPS AND PHOTOS**

7.1 **Maps:** See Schedule "A" of the Agreement for Map of the Lands, and the end of the Report for the Map of the Park.

7.2 **Photos:** Site photos and Special Features photos can be found in the documents.

Schedule "C" continued

2. Report
 - a. *Assessment of Conservation Values within Mt. Benson Regional Park, Nanaimo*

URSUS Environmental

Wildlife and Environmental Resource Consulting



Assessment of Conservation Values within Mt. Benson Regional Park, Nanaimo

FILE COPY

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Assessment of Conservation Values within Mount Benson Regional Park, Nanaimo

Executive Summary

Mount Benson Regional Park includes roughly 210 ha of forest and forms a natural backdrop to the City of Nanaimo. It was recently acquired by the Regional District of Nanaimo (RDN) in partnership with the Nanaimo Area Land Trust (NALT). Field studies there in recent years have contributed information on specific resource values. However, some important inventory components were either absent or incomplete, and most resources had yet to be analyzed in the regional context. Given the above, the three main objectives of this assignment were to:

- 1) Consolidate resource information on Mt. Benson Regional Park into a single document;
- 2) Complete the SEI ground verification process; and
- 3) Assess the site's overall value as a regional conservation area.

Existing resource information was gleaned from a variety of sources including NALT members, local naturalists, and government databases. Ground verification involved inspecting 12 of the 14 previously mapped Sensitive Ecosystem Inventory (SEI) polygons within the new park, and visits to other locations with potential for meeting designation as sensitive ecosystems. At sites selected for detailed ground-truthing, data was gathered regarding vegetation comprising the tree, shrub, and herb strata. Added to this was site information on slope, aspect, elevation and soil characteristics. Data were recorded on standardized field forms following government-developed protocols.

Assessment of conservation values associated with the site was accomplished by identifying a number of Valued Ecosystem Components (or VEC's) in common usage and rating the site's importance to them. Existing information on the park's natural resource values is considered sufficient to rate nine VEC's. These involve both overall biodiversity and the occurrence of rare and regionally uncommon elements.

Mount Benson Regional Park encompasses two Variants of the Coastal Western Hemlock Biogeoclimatic Zone. The Very Dry Maritime Coastal Variant occurs below 700 m elevation, while the Montane Moist Maritime Variant extends from 700 m elevation to the Mt. Benson summit, at approximately 1020 m. No permanently flowing streams occur within the park, but the parts of the park include the headwaters of McGarrickle Creek, a tributary of the Millstone River.

Sensitive forested, non-forested, and wetland plant communities occur within the study area. Ground verification confirmed the presence of eight of the 14 SEI Polygons mapped in 1997. Two of the eight had their primary or secondary ecosystem associations revised. Four other SEI polygons were found to be significantly degraded by logging activity in recent years. Two of the original SEI Polygons remained unconfirmed due to accessibility constraints. Nine previously unmapped sensitive ecosystems were identified

in the course of fieldwork, including four Older Forest, four Terrestrial Herbaceous and one Sparsely Vegetated units.

Non-sensitive cut-over areas, as well as early- and mid-seral stands, are the spatially dominant plant communities within the new park. They appear to represent early-seral stages of the FdPl – Cladina, FdHw - Salal and HwFd - Kindbergia ecosystem types.

Despite the incompleteness of inventory efforts, species lists compiled for this site indicate that Mount Benson Regional Park possesses considerable floral, faunal and fungal biodiversity. It supports 117 vascular plant species, 84 vertebrate species, and at least 33 species of fungi.

Of the components considered for the conservation assessment, high regional importance ratings were assigned to five VEC's: Floral, Fungal, and Faunal Biodiversity, as well as Sensitive Ecosystem Presence and Habitat Connectivity. Moderate-to-high regional importance ratings were assessed for both the Rare Plant and Rare Vertebrate Occurrence VEC's. Rare Fungi Occurrence and Ecosystem Representation VEC's were considered moderately important from the regional perspective. Based on the above, the overall conservation value of the study area is considered high.

The following recommendations were offered in order to protect and enhance the natural values of the site:

1. Any future trail development or re-alignment within the park should seek to avoid mapped sensitive ecosystems to the extent possible.
2. Trail consolidation and delineation (i.e. cairns or posts) is recommended along the summit ridgeline to protect the sensitive Terrestrial Herbaceous community there.
3. Consideration should be given to installing interpretive signage on trails approaching the summit to educate park users on the uniqueness and fragility of some plant communities.
4. Traditional uses of the site included hunting and ATV use, which are not compatible with sensitive ecosystem protection or the land's current status as parkland. Signage indicating park boundaries and forbidding hunting and motorized vehicles should be posted along old logging roads at the site.
5. Inventory is recommended to document breeding use of the site by amphibians and birds of prey, possibly in cooperation with Malaspina University-College.
6. Consideration should be given to seeding clearings with coastal native grass mixes, which will be commercially available in 2007, to increase forage production for herbivorous wildlife and provide competition for invasive exotic vegetation.

**Assessment of Conservation Values within
Mount Benson Regional Park, Nanaimo**

<u>Table of Contents</u>		<u>Page</u>
EXECUTIVE SUMMARY		<i>i</i>
1.0 INTRODUCTION		1
1.1 Background.....		1
1.2 Scope and Objectives.....		1
2.0 METHODS AND INFORMATION SOURCES		3
2.1 Field Investigation		3
2.2 Existing Information Sources		4
3.0 ENVIRONMENTAL INVENTORY		5
3.1 Regional Context		5
3.2 Watercourses.....		5
3.3 Plants and Plant Communities		7
3.4 Fungi.....		18
3.5 Wildlife Occurrence.....		19
4.0 CONSERVATION ASSESSMENT		24
4.1 Capture of Rare / Threatened Plants and Fungi.....		24
4.2 Capture of Sensitive and Under-represented and Plant Communities.....		24
4.3 Importance to “At-risk” and Regionally Important Wildlife.....		24
4.4 General Biodiversity Values.....		25
4.5 Landscape-level Considerations		25
5.0 CONCLUSIONS AND RECOMMENDATIONS		26
5.1 Summary of Conservation Values		26
5.2 Recommendations		27
6.0 REFERENCES		28

List of Figures

1. Study area context.....	2
2. Biogeoclimatic zonation within the study area.....	6
3. Revised SEI Map of area based on 2006 ground verification	12
4. Older Forest of the HwCw – Salal ecosystem type	14
5. Terrestrial Herbaceous unit with moss and lichen on rock outcrop	14
6. Bog-type wetland with acidic groundwater and peaty substrate	15
7. Dense young-seral stands of the HwFd - Kindbergia ecosystem type cover extensive areas of Mt. Benson Regional Park	15
8. Recent cut-over areas support a variety of pioneering forbs and weedy introduced herbs.....	17

List of Tables

1. Plants identified within Mt. Benson Regional Park to September of 2006	8
2. Summary of Sensitive Ecosystem Inventory Polygon ground- truthing results from 2006	11
3. Fungi documented within Mt. Benson Regional Park.....	18
4. Birds documented in the vicinity of Mt. Benson Regional Park.....	20
5. Mammal and herptile observations from Mt. Benson Regional Park and neighbouring areas.....	23
6. Conservation values captured within Mt. Benson Regional Park	26

APPENDICES

- A. Ground-truthing field data and photos collected during the summer of 2006.
- B. Conservation Data Centre Rare Element Occurrence records for vascular
Plants and plant community Tracking List.

**Assessment of Conservation Values within
Mount Benson Regional Park, Nanaimo**

1.0 INTRODUCTION

1.1 Background

The Mount Benson Regional Park encompasses approximately 210 ha of forest land forming a natural backdrop to the City of Nanaimo (Figure 1). Recently acquired by the Regional District of Nanaimo (RDN) in partnership with the Nanaimo Area Land Trust (NALT), Mt. Benson has long been recognized as a regionally significant natural area. The 1994 RDN Park System Plan identified it as one of only five natural areas considered for securing through direct purchase.

In the mid-1990's, federal and provincial environmental agencies sponsored a project to classify and map threatened ecosystems along the southeastern part of Vancouver Island. The resulting Sensitive Ecosystem Inventory (SEI) maps identified 14 sensitive polygons within the area now known as Mt. Benson Regional Park. Of the 14 SEI Polygons occurring within the park boundaries, 11 were classified as Terrestrial Herbaceous units. Single SEI Polygons representing Wetland, Older Forest, and Sparsely Vegetated ecosystems were also identified within the park area at that time. In recent years, several groups have conducted bio-inventory on Mt. Benson. In 2003 and 2004, students from Malaspina University-College identified two new polygons fitting the description of sensitive Older Forest ecosystems near the summit of Mt. Benson. More recently, area naturalists have developed partial lists of flora, fungi and avifauna occurring there.

1.2 Scope and Objectives

The above studies have contributed incrementally to the understanding of natural resource values on Mt. Benson. However, some important components are incomplete, have not been analyzed in a regional context, and/or are not in a format easily accessible to NALT personnel or prospective donors. Given the above, the three main objectives of this assignment were to:

- 1) Consolidate existing resource information into a single document;
- 2) Complete the SEI ground verification process; and
- 3) Assess the site's overall value as a regional conservation area.

Acknowledgements

We gratefully acknowledge the assistance of Gail Adrienne, Eli Pilyk, and other NALT personnel for providing background information and field assistance over the course of this project. Kevin Robillard, Geographic Information System Technician with the RDN, kindly supplied aerial photos and topographic/trail maps for the site. Field ornithologist Guy Monty provided a wealth of information regarding bird occurrence at the site, filling an important information gap.

Mt. Benson Regional Park Trail System

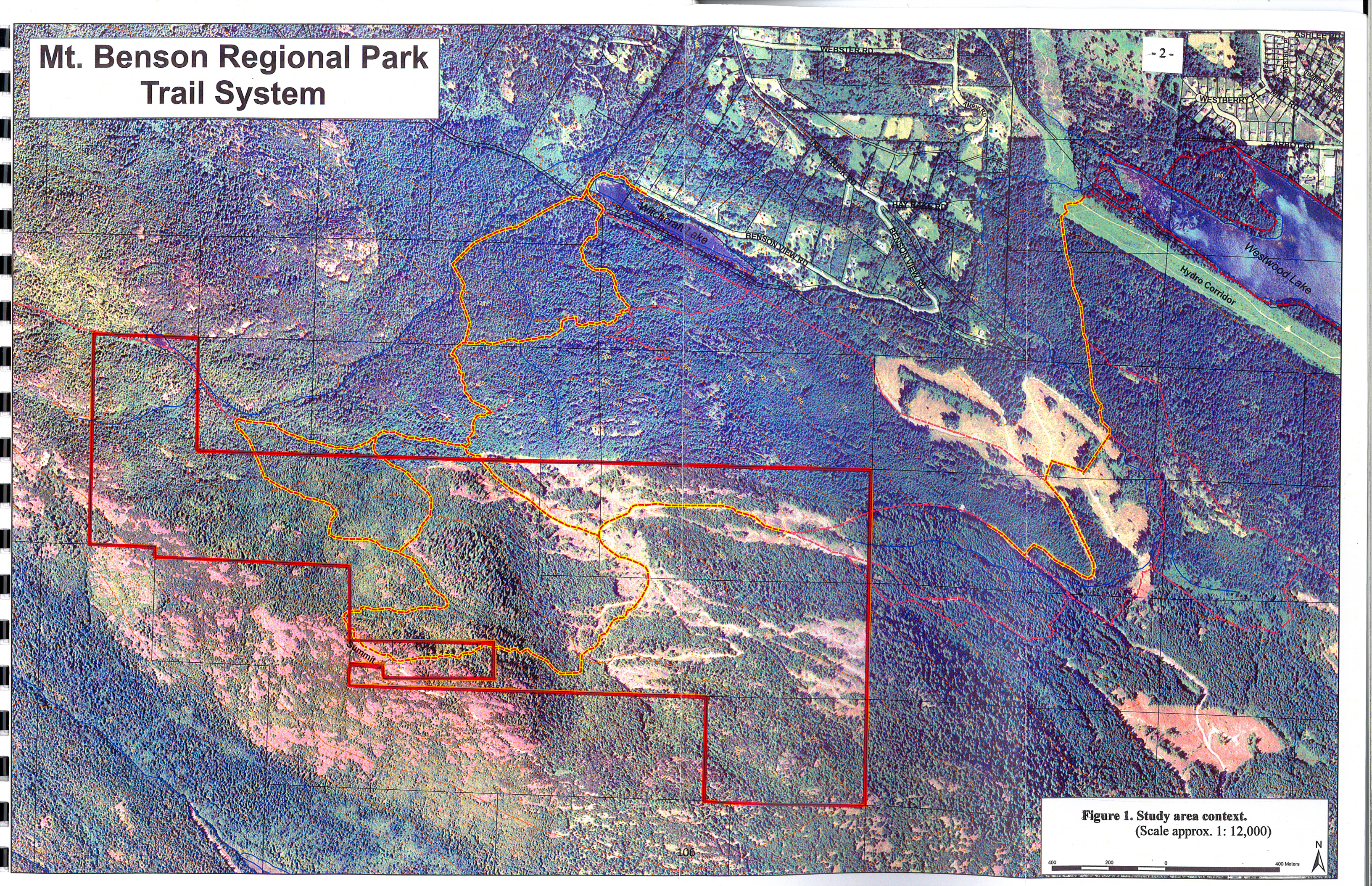
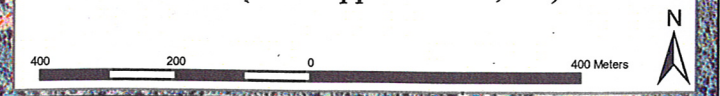


Figure 1. Study area context.
(Scale approx. 1: 12,000)



2.0 METHODS & INFORMATION SOURCES

2.1 Field Investigation

Owing to its difficult access, none of the 14 sensitive polygons identified on the site during the SEI Mapping Project had been visited during the original mapping in 1995. Instead, initial classification and boundary delineation in this area relied entirely on air photo interpretation. Ground-truthing conducted at Mt. Benson Regional Park over 2006 involved inspections of areas previously identified SEI units and searches for additional units based on analysis of recent colour orthophotos provided by the RDN. Cadastral information and trails with GPS coordinates were digitally overlain on the orthophoto, to ensure any new areas identified were within the study area.

Detailed ground verification was conducted at 12 locations with potential to meet the criteria for designation as sensitive ecosystems as described by Ward *et al.* (1998). One location had to be excluded because it occurred just south of the designated park boundary. Several other areas of potential interest were identified, but not visited due to the absence of a safe access route. At each ground-truthing location, the following environmental characteristics were recorded on the standard field forms appearing in Appendix A:

- Plant species composition and coverage of tree, shrub and herb strata;
- Estimated canopy closure (based on 4 measurements per plot);
- Elevation, mesoslope position, landform, aspect, and % slope;
- Ground cover composition and woody debris abundance;
- Soil classification (based on hand-texturing material from test pits); and
- Soil moisture and nutrient regimes (inferred from indicator plants).

Tree and shrub cover was visually estimated using comparison charts in Luttmerding *et al.* (1990). Because herb cover may be more variable, it was recorded across four 1 m x 1 m quadrats distributed in cardinal directions around the plot centre as well as in the plot centre. Plant identification of less common species was facilitated by Pojar and MacKinnon (1994). The diameter range of tree species within plots was measured at breast height using a standard diameter tape. Within the shrub and herb strata, plant distribution codes following Luttmerding *et al.* (1990) were also recorded.

In addition to the above, digital photographs were taken of the general plot and the herbage cover quadrats.

2.2 Existing Information Sources

In addition to first-hand observations, other sources of site-specific information reviewed in the course of preparing this assessment included the following:

- Ministry of Environment / Canadian Wildlife Service: Sensitive Ecosystem Inventory Project Map Sheet 92F. 020 (1:20,000 scale).
- Schedule A - Regional District of Nanaimo Park System Plan (RDN Development Services 1994).
- Malaspina University-College: Mt. Benson Sensitive Ecosystem Inventory Project – Part 1 (Smallcombe *et al.* 2003).
- Malaspina University-College: Mt. Benson Sensitive Ecosystem Inventory Project – Part 2 (Lane and Archinuk-Glaim 2004).
- Timber Appraisal for Mt. Benson Properties prepared by David Robinson Forestry Services (2005).
- NALT correspondence regarding plant occurrence from Mr. Paul Spriggs.
- NALT correspondence regarding fungi occurrence from Dr. Lawrence Winkler.
- Ursus Environmental correspondence regarding bird occurrence from Mr. Guy Monty.
- Conservation Data Centre Rare Element Occurrence Database (on-line).
- Wildlife Tree Stewardship (WITS) Database (on-line).

3.0 ENVIRONMENTAL INVENTORY

3.1 Biogeoclimatic Zonation

Mount Benson Regional Park encompasses two Variants of the Coastal Western Hemlock (or CWH) Biogeoclimatic Zone (Figure 2). The Very Dry Maritime Coastal Variant (or CWHxm2) occurs below 700 m elevation. It experiences warm dry summers and moist winters with little snow. Growing seasons are long within this Variant. However, there is usually a period of drought extending from early to late summer. Forests in the CWHxm2 are dominated by Douglas-fir with a lesser amount of western hemlock and western redcedar. The understorey is typically comprised of salal, dull Oregon grape, and red huckleberry (Green and Klinka 1994).

The Montane Moist Maritime CWH Variant (CWHmm2) extends from 700 m elevation to the summit of Mt. Benson (approx. 1020 m). This Variant has cooler temperatures, shorter growing seasons, and more snowfall than the adjacent CWHxm2. Snowpacks in the Montane Variant may even persist through the winter in some years. Occurring in the rain shadow of the Vancouver Island Ranges, there is often a shortage of water for plant growth here over mid-to-late summer.

Forest stands in the CWHmm2 Variant typically feature a variety of coniferous species. However, sites with a history of wildfire may be dominated by dense stands of Douglas-fir. Yellow cedar may replace western redcedar and mountain hemlock may replace western hemlock at the upper limits of the CWHmm2 Variant. Understorey vegetation in this Variant generally includes a large component of Alaskan blueberry and lesser occurrence of salal, oval-leaved blackberry and black huckleberry (Green and Klinka 1994).

3.2 Watercourses

Although no permanently flowing streams occur within Mt. Benson Regional Park, the area includes the headwaters of McGarrickle Creek. The latter flows northeast emptying into the Millstone River nearly 5 km from the park boundary. A portion of the park also contributes runoff to Westwood Lake, which outlets northwest into McGarrickle Creek via a short creek known as McNeil Creek.

Meltwater from the persistent snowpack in the upper reaches of the park area likely moderates summer water temperatures in the above streams, and probably helps sustain summer flows in them, a relatively uncommon situation among streams of southeast Vancouver Island.

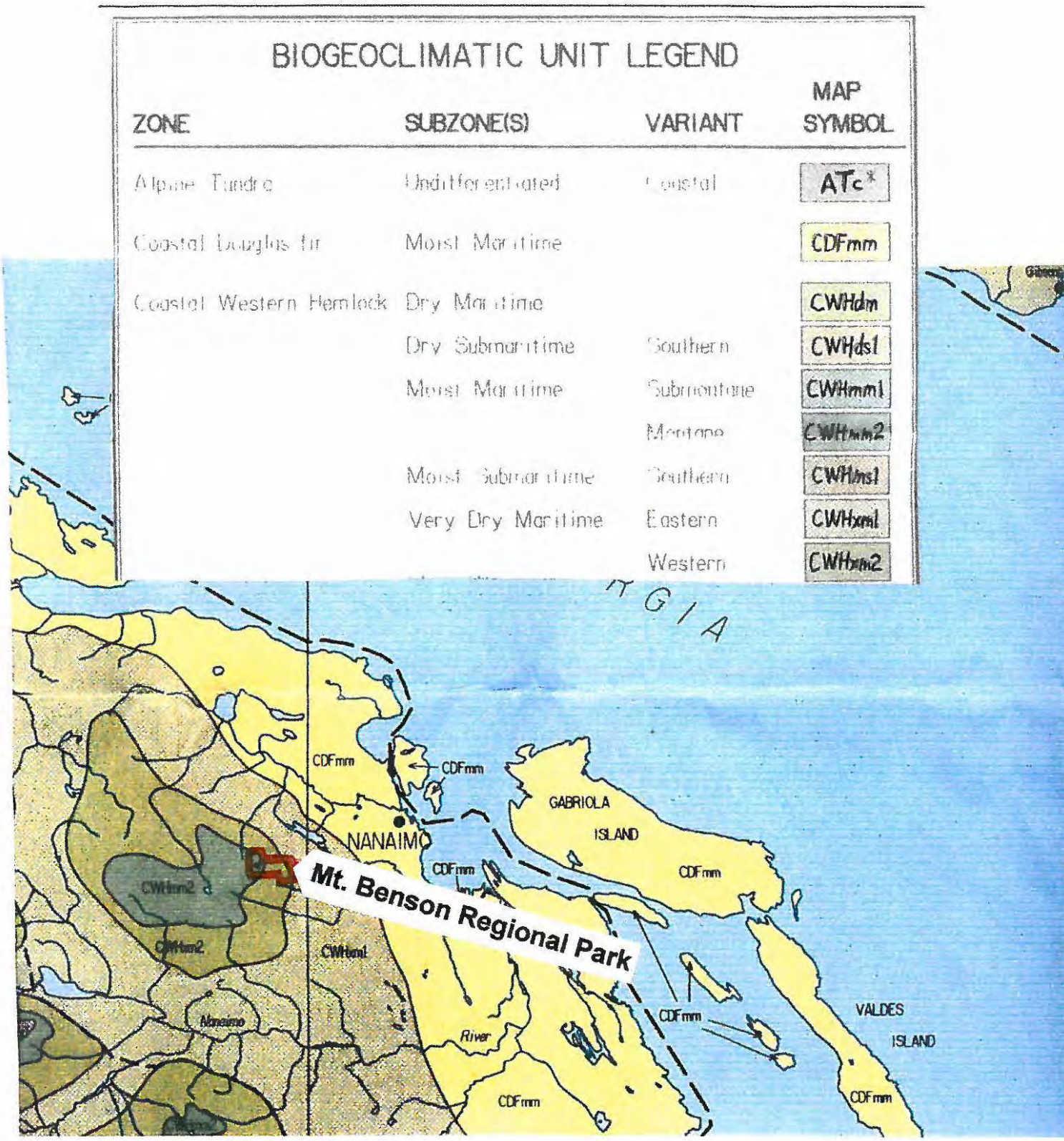


Figure 2. Biogeoclimatic zonation within the study area.

(Scale 1:250,000)

3.3 Plants & Plant Communities

Plants

To date, 117 species of vascular plants have been identified within Mt. Benson Regional Park (Table 1). The current plant list is a compilation of near-summit botanizing by Malaspina students in 2004 and Mr. Paul Spriggs in 2005. The list was supplemented by reconnaissance and field plot observations by the Ursus Environmental field crew in 2006. The current plant list includes 12 tree species, 27 shrub species, and 78 species of non-woody plants (i.e. herbs and ferns).

Sensitive Plant Communities

Sensitive forested, non-forested, and wetland plant communities occur within the study area. Ground verification of sensitive ecosystems conducted in 2006 confirmed the presence of 8 of the 14 SEI Polygons identified in 1997 (Table 2). Two of the eight had their primary or secondary ecosystem associations revised. Four other SEI polygons were found to be significantly degraded by logging activity in recent years, while two others remained unconfirmed due to accessibility constraints. Nine new sensitive ecosystems were identified in the course of fieldwork, including four Older Forest, four Terrestrial Herbaceous and one Sparsely Vegetated unit. The location of the previously unmapped units is provided in Figure 3 below.

Older Forest : HwBa - Pipecleaner Moss Community

Older conifer-dominated stands within Mt. Benson Regional Park are generally small (6 ha or less in area) and widely dispersed. The pattern of their distribution suggests they were retained because they presented operational challenges to logging (i.e. difficult or impractical to yard before the advent of heli-logging). This plant community typically develops on slightly moist soils with average nutrient levels. The canopy in this ecosystem is dense and multi-layered, but it interspersed with openings created by large falling trees. Mature stands feature large-diameter western hemlock and Douglas-fir trees, with some specimens exceeding 80 cm in diameter. Common understorey plants include: salal, black huckleberry, and Alaskan blueberry. Older successional stages (or seres) of the HwBa – Pipecleaner community are Blue-Listed within the South Island Forest District (Appendix B).

Older Forest : HwCw – Salal Community (Figure 4)

This ecosystem type is restricted to a single stand in the northwestern part of the site. The forest canopy is semi-open and dominated by large-diameter hemlock specimens (to 70 cm DBH) festooned with arboreal lichens. There are several significant western white pine specimens interspersed among the hemlocks. The understorey is relatively dense here as a result of the large canopy gaps. It is dominated by salal with a minor occurrence of Oregon grape, red huckleberry, and juvenile conifers. Older seres of this plant community are also Blue-Listed in the South Island Forest District.

Table 1. List of plants identified within Mt. Benson Regional Park to September 2006.

Scientific Name	Common Name	Typical Habitats / Comments
TREES (12 species)		
<i>Abies amabilis</i>	Amabilis fir	moist montane forest
<i>Abies lasiocarpa</i>	Subalpine fir	high elevation parkland
<i>Abies grandis</i>	Grand fir	floodplain and moist forests
<i>Alnus rubra</i>	Red alder	moist woods, recent clearings
<i>Arbutus menziesii</i>	Arbutus	dry forest with rapid drainage
<i>Chamaecyparis nootkatensis</i>	Yellow cedar	moist to wet sites, mid-to-high elevation forest
<i>Pinus contorta</i> var. <i>contorta</i>	Shore pine	nutrient poor rocky hilltops
<i>Pinus monticola</i>	Western white pine	open dry slopes (uncommon)
<i>Pseudotsuga menziesii</i> ssp. <i>Menziesii</i>	Douglas-fir	lowland and montane forest
<i>Thuja plicata</i>	Western redcedar	moist areas low to mid elevation
<i>Tsuga heterophylla</i>	Western hemlock	low to middle elevation forest
<i>Tsuga mertensiana</i>	Mountain hemlock	montane forest to timberline
SHRUBS (27 species)		
<i>Alnus crispa</i> ssp. <i>sinuate</i>	Sitka alder	mid-elevation slide tracks, clearings
<i>Amelanchier alnifolia</i>	Saskatoon	dry coniferous forest, clearcuts
<i>Andromeda polifolia</i>	Bog rosemary	bogs and fens
<i>Arctostaphylos uva-ursi</i>	Kinnickinnick	rock outcrop
<i>Gaultheria shallon</i>	Salal	coniferous forest
<i>Holodiscus discolor</i>	Oceanspray	dry forest with rapid drainage
<i>Juniperis communis</i>	Common juniper	dry openings, rock outcrops
<i>Juniperis scopulorum</i>	Rocky Mountain juniper	dry rocky openings (uncommon)
<i>Ledum groenlandicum</i>	Labrador tea	peatlands, bog forest
<i>Linnaea borealis</i>	Twinflower	upland forest.
<i>Mahonia nervosa</i>	Dull Oregon grape	upland forest
<i>Oxycoccus oxycoccus</i>	Bog cranberry	bog margins
<i>Ribes lacustre</i>	Black gooseberry	moist woods, streambanks
<i>Ribes sanguineum</i>	Red-flowering current	edges of dry forests
<i>Rosa gymnocarpa</i>	Baldhip rose	widespread and common
<i>Rubus leucodermis</i>	Blackcap	clear-cuts and open forests
<i>Rubus pedatus</i>	Five-leaved bramble	moist mossy forest
<i>Rubus spectabilis</i>	Salmonberry	moist to wet forest
<i>Rubus ursinus</i>	Trailing blackberry	upland forest
<i>Salix scouleriana</i>	Scouler's willow	upland forest edges
<i>Sorbus sitchensis</i>	Mountain ash	open forest, parkland
<i>Vaccinium alaskaense</i>	Alaskan blueberry	moist coniferous forest
<i>Vaccinium caespitosum</i>	Dwarf blueberry	moist rocky ridges
<i>Vaccinium membranaceum</i>	Black huckleberry	dry to moist conifer forest
<i>Vaccinium ovalifolium</i>	Oval-leaved blueberry	moist coniferous forest
<i>Vaccinium parvifolium</i>	Red huckleberry	coniferous forest
<i>Vaccinium vitis-idaea</i>	Mountain bog cranberry	high-elevation bog margins
FERNS (5 species)		
<i>Blechnum spicant</i>	Deer fern	moist to wet forests

<i>Cryptogramma crispa</i>	Parsley fern	dry rocky openings
<i>Polypodium glycyrrhiza</i>	Licorice fern	mossy rock faces
<i>Polystichum munitum</i>	Sword fern	moist forest
<i>Pteridium aquilinum</i>	Bracken fern	forest and meadows
HERBS (73 species)		
<i>Achillea millefolium</i>	Yarrow	dry meadow, rock outcrop
<i>Achlys triphylla</i>	Vanilla-leaf	moist shady forest
<i>Agrostis exarata</i>	Spike bentgrass	common and widespread
<i>Anaphalis margaritacea</i>	Pearly everlasting	rocky slopes, clearings
<i>Antennaria alpine</i>	Alpine pussytoes	Rocky ridge lines
<i>Antennaria microphylla</i>	Rosy pussytoes	Rocky ridge lines
<i>Antennaria parviflora</i> (?)	Nuttal's pussytoes	subalpine meadows
<i>Arenaria tenella</i> (?)	Slender sandwort	subalpine meadows
<i>Arenaria tennella</i> (?)	Mountain arnica	subalpine meadows
<i>Aruncus dioicus</i>	Goat's beard	forest edges
<i>Biddens</i> sp.	Beggarticks	wetland margins, ditches
<i>Camassia quamash</i>	Common camas	dry meadow, rock outcrop
<i>Campanula lasiocarpa</i>	Mountain harebell	rock outcroppings
<i>Carex hendersonii</i>	Henderson's sedge	wet forest
<i>Carex obnupta</i>	Slough sedge	swamps and fens
<i>Carex viridula</i>	Green sedge	bogs, fens, wet meadows
<i>Castilleja hispida</i>	Harsh paintbrush	dry meadow
<i>Cerastium arvense</i>	Field chickweed	dry meadow, rock outcrop
<i>Chimaphila umbellata</i>	Prince's-pine	upland forest
<i>Collinsia parviflora</i>	Small-flowered blue-eyed mary	vernally moist meadows, mossy rock outcrops
<i>Corallorhiza maculata</i> ssp. <i>Mertensiana</i>	Western coralroot	mature upland forest
<i>Corallorhiza striata</i>	Striped coralroot	mature upland forest
<i>Cornus Canadensis</i>	Bunchberry	moist forest, bogs
<i>Danthonia intermedia</i>	Timber oatgrass	dry rocky openings
<i>Drosera rotundifolia</i>	Round leaved sundew	bog margins
<i>Epilobium anagallidifolium</i>	Alpine willow herb	high-elevation seepage sites
<i>Epilobium angustifolium</i>	Fireweed	recently burned sites
<i>Equisetum fluviatile</i>	Swamp horsetail	moist to wet forest
<i>Eriophorum angustifolium</i>	Narrow leaved cottongrass	subalpine meadow
<i>Erythronium grandiflorum</i>	Yellow glacier lily	subalpine meadow
<i>Festuca occidentalis</i>	Western fescue	dry meadows and outcrops
<i>Fragaria vesca</i>	Woodland strawberry	widespread and common
<i>Fragaria vesca</i>	Woodland strawberry	openings and open forest
<i>Geum macrophyllum</i>	Large-leaved avens	open forest
<i>Goodyera oblongifolia</i>	Rattlesnake-plantain	moist coniferous forest
<i>Hieracium umbellatum</i>	Narrow-leaved hawkweed	vernally moist outcrops
<i>Heuchera micrantha</i>	Small-flowered alumroot	moist moss-cover rocks
<i>Lazula parviflora</i>	Small-flowered woodrush	moist sites
<i>Leucanthemum vulgare</i>	Oxeye daisy	meadows and disturbed sites
<i>Lilium columbianum</i>	Tiger lily	meadows; open forest
<i>Listera caurina</i>	Northwestern twayblade	coniferous forest
<i>Lomatium martindalei</i>	Martindale's lomatium	dry meadows; rocky slopes
<i>Lotus denticulatus</i>	Meadow Birds-foot trefoil	widespread introduced species
<i>Lupinus arcticus</i>	Arctic lupine	subalpine meadow
<i>Menyanthes trifoliata</i>	Buckbean	bogs, fens, marshes
<i>Monotropa uniflora</i>	Indian pipe	upland coniferous forest

<i>Montia parviflora</i>	Small-leaved montia	moist mossy rock outcrops
<i>Nuphar polysepalum</i>	Yellow pond lily	permanent wetlands
<i>Orthilia secunda</i>	One-sided wintergreen	coniferous forest
<i>Penstemon davidsonii</i>	Davidson's penstemon	rock ledges, talus
<i>Platanthera unalascensis</i>	Alaska rein orchid	coniferous forest
<i>Poa arcticata</i>	Arctic bluegrass	alpine and talus slopes
<i>Prunella vulgaris</i>	Self-heal	moist forest edges
<i>Pyrola asarifolia</i>	Pink wintergreen	coniferous forest
<i>Pyrola picta</i>	White-veined wintergreen	coniferous forest
<i>Ranunculus occidentalis</i>	Western buttercup	moist meadows and forest
<i>Rhynchospora alba</i>	Whitebeak rush	moist meadows
<i>Saxifraga ferrugine</i>	Alaska saxifrage	moist mossy rock outcrops
<i>Sedum divergens</i>	Spreading stonecrop	dry rock outcrops
<i>Sedum oregonium</i>	Oregon stonecrop	rock ledges, talus
<i>Senecio macounii</i> (Blue-Listed)	Macoun's groundsel	dry open forest & edges
<i>Silene sp. (?)</i>	Catchfly	dry open slopes
<i>Solidago multiradiata</i>	Northern goldenrod	rocky ridges
<i>Streptopus roseus</i>	Rosy twistedstalk	moist forest
<i>Tiarella trifoliata</i>	Foamflower	moist forests
<i>Tofieldia glutinosa</i>	Sticky false asphodel	moist forests
<i>Tolmia menziesii</i>	Piggy-back plant	moist forest
<i>Trientalis arctica</i>	Northern starflower	upland forest
<i>Trientalis latifolia</i>	Western starflower	upland forest
<i>Trillium ovatum</i>	Western trillium	moist upland forest
<i>Veratrum viride</i>	Indian hellebore	late snowmelt pockets
<i>Viola glabella</i>	Stream violet	moist forest, stream banks
<i>Viola sempervirens</i>	Trailing yellow violet	widespread in moist areas
NON-VASCULAR BRYOPHYTES (16 species)		
<i>Cladonia chlorophaea</i>	False pixie cup	
<i>Cladonia macilenta</i>	Lipstick cladonia	
<i>Cladina portentosa</i>	Coastal reindeer lichen	
<i>Cladonia squamosa</i>	Dragon cladonia	
<i>Umbilicaria torrefacta</i>	Punctured rocktripe	
<i>Alectoria sarmentosa</i>	Common witch's hair	
<i>Peltigera britannica</i>	Freckle pelt lichen	
<i>Metaneckera menziesii</i>	Menzies' neckera	
<i>Racomitrium lanuginosum</i>	Hoary rock moss	
<i>Racomitrium canescens</i>	Roadside rock moss	
<i>Polytrichum juniperinum</i>	Juniper haircap moss	
<i>Dicranum scoparium</i>	Broom moss	
<i>Hylocomium splendens</i>	Stepmoss	
<i>Kindbergia oregana</i>	Oregon beaked moss	
<i>Lycopodium annotinum</i>	Stiff clubmoss	
<i>Rhytidiadelphus robusta</i>	Pipecleaner moss	

Notes:

Sources of records are as follows:

Paul Spriggs, July 11, 2005 correspondence with NALT.

Lane and Archinuk-Glaim. 2004, Malaspina Resource Management Officer
Technology Program, Malaspina University-College.

Joe Materi, Ursus Environmental, Aug. and Sept. 2006 field notes.

Table 2. Summary of Sensitive Ecosystem Inventory Polygon ground-truthing results from 2006.

1997 SEI Polygon ID / 2006 ID	Sensitive Ecosystem Type	Ground Verification Results
N0303	Older Forest	Reconfigured to 2 ha from approx. 6 ha area.
N0307	Terrestrial Herbaceous	Confirmed as rock outcrop.
N0307A	Terrestrial Herbaceous	Deleted -disturbed by recent logging.
N0309	Terrestrial Herbaceous	Confirmed as rock outcrop.
N0310A	Terrestrial Herbaceous	Deleted - disturbed by recent logging.
N0310B	Terrestrial Herbaceous	Deleted-disturbed by recent logging.
N0310C	Terrestrial Herbaceous	Deleted -disturbed by recent logging.
N0311	Terrestrial Herbaceous	Confirmed as rock outcrop; revised Secondary association from "SG" to Cliff (cl).
N0313	Sparsely Vegetated	Unconfirmed due to lack of safe access.
N0314	Terrestrial Herbaceous	Unconfirmed due to lack of safe access.
N0317	Terrestrial Herbaceous	Confirmed as rock outcrop.
N0918A	Wetland - Swamp	Revised to Wetland – bog (WN:bg)
N0919C	Terrestrial Herbaceous	Confirmed as Rock Outcrop from Benson summit and air photo (inaccessible).
N0919D	Terrestrial Herbaceous	Confirmed as Rock Outcrop from Benson summit and air photos (inaccessible).
OF-1 (VP 9)	Older Forest	CWHmm2/03 = HwCw – Salal plant community
OF-2 (VP 8)	Older Forest	CHWmm2/01 = HwBa – Pipecleaner moss plant community
OF-3 (VP 4)	Older Forest	CHWmm2/01 = HwBa – Pipecleaner moss plant community
OF-4 (VP 12)	Older Forest	CHWxm2/03 – FdHw – Salal Plant community (remnant of old Polygon N0303)
OF-5 (no plot)	Older Forest	CWHmm2/01 =HwBa – Pipecleaner moss plant community
HT-1 (VP 5)	Terrestrial Herbaceous	HT: ro (rock outcrop/moss as primary ecosystem)
HT-2 (VP 10)	Terrestrial Herbaceous	HT: ro (rock outcrop/moss as primary ecosystem)
HT-3 (VP 3)	Terrestrial Herbaceous	HT:sh (shrub w/ rock outcroppings)
HT-4 (VP 7)	Terrestrial Herbaceous	HT: ro (rock outcrop/moss as primary ecosystem)
SV-1 (no plot)	Sparsely Vegetated	SV: cl (cliff as primary ecosystem)

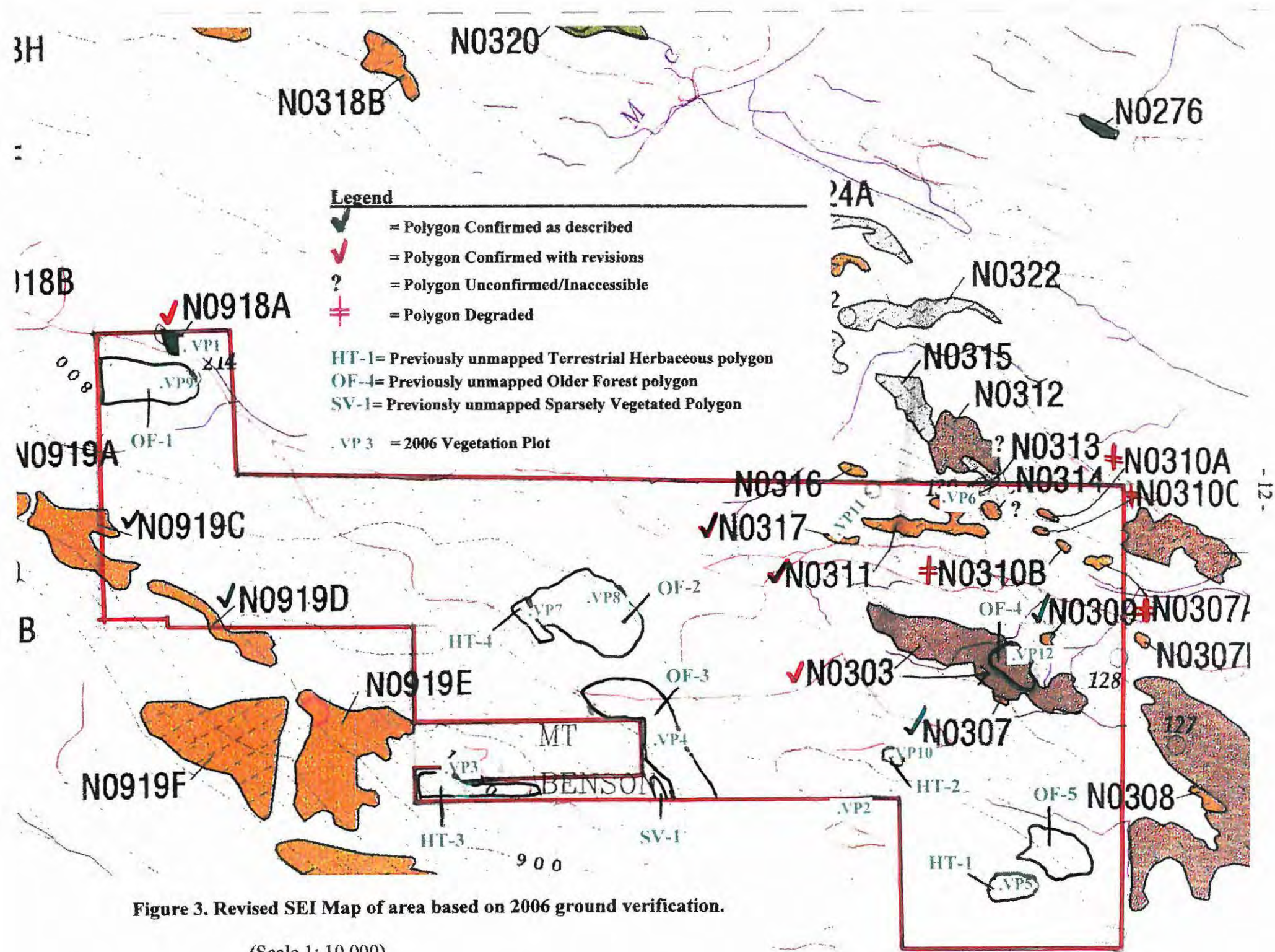


Figure 3. Revised SEI Map of area based on 2006 ground verification.

(Scale 1: 10,000)

Older Forest: FdHw – Salal Community

The only Older Forest ecosystem occurring within the CWHxm2 Variant was a remnant of SEI Polygon N0303 in the moderately steep east-central part of the site. This stand is comprised of well-spaced Douglas-fir trees supporting a light covering of arboreal lichens. The largest firs have attained diameters approaching 60 cm in diameter, and appear to be rooted along joints and fissures in the underlying bedrock. The understorey contains dense pole-sapling patches of fir, hemlock, and yellow cedar trees along with patches of salal. Ground cover is largely step moss interspersed with Oregon beaked moss.

Terrestrial Herbaceous (Figure 5)

This plant community develops on bedrock outcroppings where soils are thin and rapidly draining, where nutrients are readily leached (Ward *et al.* 1998). They occur mostly as small units aggregated into linear bands along rocky ridgelines. Typical ground cover in these areas includes hoary rock moss, juniper haircap moss, broom moss, coastal reindeer lichen, and lipstick cladonia lichen. Salal and kinnickinnick occurs in some locations, while one is dominated by dwarf blueberry.

A number of Terrestrial Herbaceous communities were identified in the northeast and south-central parts of the site on the 1997 SEI Map covering the site (Figure 3). Some of these have been disturbed by logging activity in recent years. Several new units of this type were located during the 2006 ground-truthing in the central and southeastern parts of the site. The HT units around the Mt. Benson summit and in the northeast part of the site are complexed with the Sparsely Vegetated (SV) ecosystems referred to as inland cliffs.

Sparsely Vegetated

A previously unmapped cliff face (SV:cl) was identified near the Mt. Benson summit during the 2006 fieldwork. It occurs in the central part of the site, along the southern park boundary. No vegetation could be identified growing on the cliff at a distance, but these areas typically support a few grasses and dry-adapted wildflowers. The SV unit identified on the 1997 SEI map could not be visited in the field due to difficult access, and could not be checked from afar because of the topography and the limited vantage points. The small size and steepness of cliffs makes them difficult to detect from aerial photos, although topographic maps may be useful in identifying potential areas of occurrence.

Wetland: Bog (Figure 6)

Bogs, or peatlands with a water table at or near the surface, usually develop in confined basins where average temperatures are cool and precipitation is high. These conditions result in slow rates of plant decomposition and acidic groundwater, which few plants are adapted to thrive in. A single bog-type wetland occurs in the northwest part of



Figure 4. Older Forest of the HwCw – Salal ecosystem type.



Figure 5. Terrestrial Herbaceous unit with moss and lichen on rock outcrop.



Figure 6. Bog-type wetland with acidic groundwater and peaty substrate.

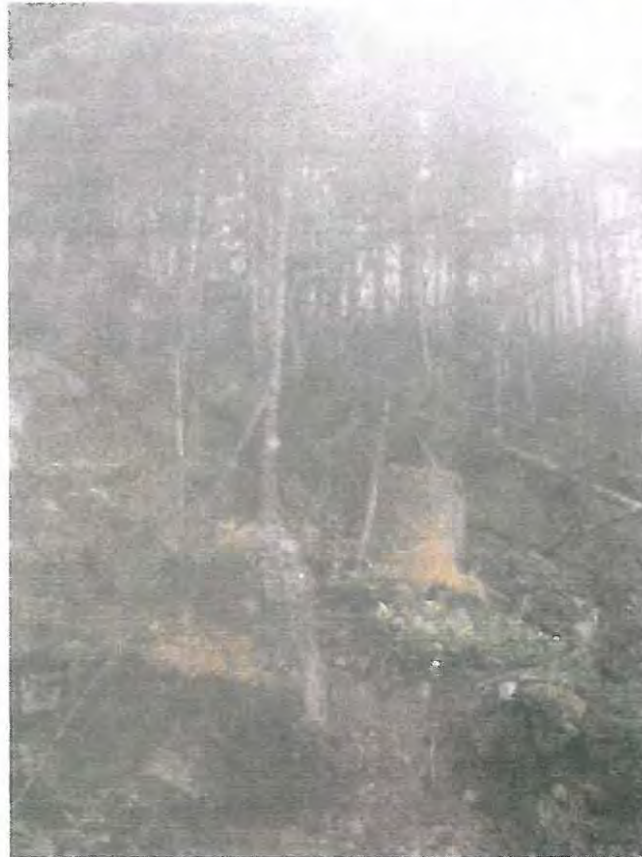


Figure 7. Dense young-seral stands of the HwFd - Kindbergia ecosystem type cover extensive areas of Mt. Benson Regional Park.

the site, covering approximately 0.5 ha. It supports several characteristic plants including Labrador tea, bog-rosemary, and sundew.

Non-Sensitive Plant Communities

Recent Clear-cut (Figure 8)

Logging activities conducted over 2003 and 2004 converted approximately 64 ha of forest within Mt. Benson Regional Park to the early (i.e. herb/shrub) stage of succession. The clearings are concentrated in the east-central and north-central parts of the site. They currently support a mix of native pioneering and weedy introduced forbs and grasses. No evidence of conifer re-stocking was noted in this plant community.

Early Seral HwFd - *Kindbergia* Communities (Figure 7)

This plant community forms the most extensive cover within Mt. Benson Regional Park. It has developed on relatively dry soils of side slopes with average to low nutrient levels. It is characterized by small-diameter trees with high canopy closure which has suppressed, and in some cases eliminated, native understorey vegetation. Shade intolerant Douglas-fir is the dominant tree in this plant community, and is often the only tree other than shore pine in old burned areas. There is a minor component of western redcedar and western white pine in areas that escaped wildfire.

Mid-seral FdHw - Salal Communities

Pure stands of shore pine and mixed stands of shore pine and Douglas-fir occur infrequently in the study area. These plant communities are restricted to dry ridge and hill crests with shallow soils in the southeastern and southwestern parts of the site. Due to the difficult growing conditions, tree diameters rarely exceed 30 cm and the canopy is open to semi-open. Salal typically forms a dense cover in the understorey of this nutrient-poor plant community.

Mid-seral FdPl - *Cladina* Communities

This plant community has essentially the same plant composition as the FdHW-Salal, but occurs at lower elevation (i.e. in the CWHxm2 Variant vs. the CWHmm2 Variant). It is restricted to a single pocket in the northeast part of the site.



Figure 8. Recent cut-over areas support a variety of pioneering native forbs and weedy introduced herbs.

3.4 Fungi

No formal inventory of fungi occurring on Mt. Benson has been published. However, casual observations compiled over nearly two decades by Dr. Lawrence Winkler indicate a rich fungi assemblage is present in the study area. Thirty-three forms of fungi have been identified to the species level (Table 3). Representatives of seven major fungi groups have been discovered in the area, including: Boletes, Suillii, Chanterelles, Gilled mushrooms, Spine fungi, Coral fungi, and Jelly fungi.

According to Dr. Winkler, Bolete mushrooms are found primarily within older forest types at higher elevations in the autumn, although they are occasionally seen on ridges as well. Gilled mushrooms occur within suitable habitats at all elevations, while Spine fungi are reported to be most abundant at middle elevations within the study area.

Table 3. Fungi documented within Mt. Benson Regional Park.

Species	Remarks	Species	Remarks
BOLETES		CHANTERELLES	
<i>Boletes chrysenteron</i>	Found in older forest at higher elevations; occasionally on ridges	<i>Cantharellus cibarius</i>	Found from late July through late September.
<i>Boletes coniferarum</i>	“ “	<i>Cantharellus infundibuliformis</i>	“ “
<i>Boletes pulcherrimus</i>	“ “	<i>Cantharellus subalbidus</i>	“ “
<i>Boletes smithii</i>	“ “	<i>Gomphus floccosus</i>	Common and widespread occurrence.
<i>Boletes zelleri</i>	“ “	<i>Polyozellus multiplex</i>	rare; termed clustered blue chanterelle
<i>Boletes edulis</i>	“ “	GILLED MUSHROOMS	
<i>Boletes mirabilis</i>	“ “	<i>Pleurotus ostreatus</i>	Found at all elevations early spring to late fall.
<i>Fuscoboletinus ochraceoroseus</i>	“ “	<i>Coprinus comatus</i>	“ “
SUILLII		<i>Laccaria amethystina-occidentalis</i>	“ “
<i>Suillus brevipes</i>	“ “	<i>Lactarius fragilis</i>	“ “
<i>Suillus caeruleus</i>	“ “	<i>Lactarius rubrilacteus</i>	“ “
<i>Suillus cavipes</i>	“ “	<i>Clitocybe nuda</i>	“ “
<i>Suillus granulatus</i>	“ “	<i>Lyophyllum decastes</i>	“ “
<i>Suillus luteus</i>	“ “	<i>Russula xerampelina</i>	“ “
<i>Suillus subolivaceus</i>	“ “	<i>Agaricus augustus</i>	“ “
<i>Suillus tomentosus</i>	“ “	OTHER	
		<i>Psuedohydnum geltinosum</i>	
		<i>Sparassis crispa</i>	
		<i>Hydnum repandum</i>	

3.5 Wildlife Occurrence

Avifauna

As indicated in Table 4 below, more than 75 bird species have been recorded in or near the study area. Of these, 52 species are known to breed locally while eight others likely only over-winter in the region. Two bird species are normally only present during the fall migration and several others occur very infrequently.

The Mt. Benson assemblage includes a large number of aerialists. There 17 raptorial species, with 12 that are day-active and five that are largely nocturnal. Members of the *buteo*, *accipiter*, *falcon* and *owl* families are well-represented among the raptors occurring in the area. No conspicuous raptor nests have been documented on the site, but a bald eagle nest is present nearby at Westwood Lake. It should be noted that many raptors use inconspicuous locations for nesting, and may nest in suitable forest patches within the study area. Other aerialists of the site's bird assemblage include swallows (3 species), swifts (2 species), the turkey vulture, and the rufous hummingbird. Passerines, or perching landbirds, are the best-represented "guild" in the bird assemblage. There are nine species of thrushes, seven species of warblers, six species each of sparrows and finches, three flycatcher species, and two vireo species documented within the study area.

Tree-climbers are a small but important component of the area's avifauna, with four species of woodpeckers, one nuthatch and one creeper. These birds are mostly year-round residents of the forest. The ground-walking group of birds is comprised of two kinds of grouse, band-tailed pigeons, and mourning doves.

Rounding out the bird assemblage is the small but vocal group referred to as corvids. Three of the four corvids in the region occur within Mt. Benson Regional Park: the common raven, Steller's Jay, and gray jay. The latter is strongly associated with montane habitats.

Mammals

Compared to the adjacent Mainland Coast, Vancouver Island does not possess a diverse mammal assemblage. Given the secretive and nocturnal habits of many mammals, it is not surprising that few direct observations have been recorded within Mt. Benson Regional Park (Table 4). Columbian black-tailed deer are quite common in the region, and their sign has been recorded in several parts of the study area. However, factors such as the extensive closed-canopy forest, and the high and persistent snowfall accumulations, suggest deer do not occur at the high densities seen around the outskirts of Nanaimo. Sign attributed to two large carnivores, the cougar and black bear, have been noted within the park. Several scats found on old logging roads in 2006 were identified as belonging to marten, a highly arboreal member of the weasel family.

Table 4. Birds documented in the vicinity of Mt. Benson Regional Park.

Species	Local Abundance / Status	Remarks
Turkey Vulture	Abundant	Breeds locally. May nest in caves at base of remote cliffs.
Bald Eagle	Abundant	Nearest documented nest is near Westwood Lake.
Northern Harrier	Abundant	Only abundant during fall migration.
Sharp-shinned Hawk	Common	Breeds locally. Only common during fall migration.
Cooper's Hawk	Common	Breeds locally. Only common during fall migration.
Northern Goshawk (Red-Listed)	Uncommon	Nearest documented nest is in the Nanaimo River Valley.
Red-tailed Hawk	Common	Nests in trees @ edges of clearings.
Rough-legged Hawk	Uncommon	Present only over winter
Golden Eagle	Rare	Breeds locally. Cliff-nester
American Kestrel	Uncommon	Breeds locally. Seen mostly in summer.
Merlin	Common	Breeds locally, often nests near water.
Peregrine Falcon	Uncommon	Cliff-nester. Nearest known nest is on Gabriola Island.
Ruffed Grouse	Uncommon	Breeds locally.
Blue Grouse	Uncommon	Breeds locally.
Mew Gull	Abundant	Over winters here, but breeds on remote lakes.
Band-tailed Pigeon	Abundant	Breeds locally.
Mourning Dove	Rare	No breeding records in area.
Western Screech-owl (Blue-Listed)	Uncommon	Breeds locally. Cavity-nester
Great Horned Owl	Uncommon	Breeds locally
Snowy Owl	Rare	Seen in some winters when vole popn's are low to north.
Northern Pygmy-owl	Uncommon	Breeds locally. Cavity nester.
Barred Owl	Uncommon	Breeds locally, usually in broken tree trunks.
Northern Saw-whet Owl	Uncommon	Breeds locally.
Common Nighthawk	Common	Breeds locally. Only present over summer.
Black Swift	Uncommon	No breeding records in area.
Vaux's Swift	Uncommon	No breeding record in area. Cavity-nester
Rufous Hummingbird	Abundant	Breeds locally. Numbers have apparently declined in recent years.
Red-breasted Sapsucker	Common	Breeds locally. Primary Cavity Excavator
Hairy Woodpecker	Common	Breeds locally. Primary Cavity Excavator
Northern Flicker	Abundant	Breeds locally. Primary Cavity Excavator
Pileated Woodpecker	Common	Breeds locally. Primary Cavity Excavator
Olive-sided Flycatcher	Common	Breeds locally. Summer visitant.
Hammond's Flycatcher	Common	Breeds locally. Summer visitant.
Pacific-slope Flycatcher	Common	Breeds locally. Summer visitant.
Northern Shrike	Uncommon	Over-winters in region.
Cassin's Vireo	Common	Breeds locally. Summer visitant.
Hutton's Vireo	Common	Breeds locally. Resident species.

Gray Jay	Rare	Associated with montane habitats.
Steller's Jay	Abundant	No nesting records in region. Resident species
Common Raven	Abundant	Breeds locally. Resident species.
Tree Swallow	Abundant	Breeds locally. Summer visitant.
Violet-green Swallow	Abundant	Breeds locally. Summer visitant.
Barn Swallow	Abundant	Breeds locally. Summer visitant.
Chestnut-backed Chickadee	Abundant	Breeds locally. Resident species.
Red-breasted Nuthatch	Common	Breeds locally. Resident species.
Brown Creeper	Common	Breeds locally. Resident species.
Winter Wren	Common	Breeds locally. Resident species.
Golden-crowned Kinglet	Abundant	Breeds locally. Resident species.
Ruby-crowned Kinglet	Abundant	Over-winters in region.
Mountain Bluebird	Rare	No breeding records in region.
Townsend's Solitaire	Rare	Over-winters in region.
Swainson's Thrush	Abundant	Breeds locally. Summer visitant.
Hermit Thrush	Uncommon	Breeding not confirmed in region.
American Robin	Abundant	Local breeder. Resident species.
Varied Thrush	Abundant	Breeding not confirmed in region.
American Pipit	Common	Seen mostly during fall migration.
Cedar Waxwing	Abundant	Breeds locally.
Orange-crowned Warbler	Abundant	Breeds locally. Mostly a summer visitant.
Yellow-rumped Warbler	Abundant	Breeds locally. Mostly a summer visitant.
Black-throated Gray Warbler	Common	Breeds locally. Summer visitant.
Townsend's Warbler	Abundant	Breeds locally. Summer visitant.
MacGillivray's Warbler	Common	Breeds locally. Summer visitant.
Wilson's Warbler	Abundant	Summer visitant. Most breed elsewhere.
Western Tanager	Common	Breeds locally. Summer visitant.
Savanna Sparrow	Abundant	Breeds locally. Summer visitant.
Fox Sparrow	Abundant	Over-winters in region.
Song Sparrow	Abundant	Breeds locally. Resident species.
Golden-crowned Sparrow	Abundant	Over-winters in region.
Brown-headed Cowbird	Abundant	Breeds locally. Mostly a summer visitant.
Dark-eyed Junco	Abundant	Breeds locally. Resident species.
Gray-crowned Rosy Finch	Vagrant	Very few records in region.
Pine Grosbeak	Rare	Over-winters in region.
Purple Finch	Abundant	Breeds locally. Resident species.
Red Crossbill	Uncommon	Breeds locally. Resident species.
Common Redpoll	Rare	Over-winters in region.
Pine Siskin	Abundant	Breeds locally. Resident species.

Notes:

Sources of records are as follows:

- Guy Monty, Field Ornithology Consultant, personal communication.
- Smallcombe *et al.* 2003, Malaspina Resource Management Officer
Technology Program, Malaspina University-College.
- Joe Materi, Ursus Environmental, Aug. and Sept. 2006 field notes.

Red squirrels were heard in several locations, typically in stands with a large component of mature Douglas-fir. Deer mice are common and widespread on Vancouver Island. Their tracks were found in five of the six track plates installed by Malaspina students (Lane and Archinuk-Glaim 2004).

Though not documented on the site, three other small mammals are widely distributed in suitable habitats on southern Vancouver Island. The dusky shrew is a small insectivore common to forest habitats from sea level to timberline. The closely related vagrant shrew appears to favour stands with rich, moist soils, as well as cut-over areas and grassy fields (Nagorsen 1996). Townsend's vole, a large but nondescript field mouse generally associated abandoned pasture lands, frequently occurs in subalpine meadows (Eder and Pattie 2001) and around the margins of wetlands (Maser 1998).

Amphibians and Reptiles

Three species of native amphibians, all pond-breeders, have been documented within the study area (Table 5). Due to the timing of the fieldwork, on-site breeding has only been confirmed for the one species, the northwestern salamander. This species may require two growing seasons to transform into a terrestrial adult in high-elevation ponds, and sometimes retains its larval form into adulthood (Green and Campbell 1984). In addition to northwestern salamanders, it is suspected that the bog in the northwest part of the site also supports breeding by the Pacific treefrog. Vocalizations by this species were observed around the bog margins in August of 2006. Because adult western toads may travel several kilometers from their breeding areas (Wind and Dupuis 2002), recent observations of this species on Mt. Benson is not strong evidence for breeding in the bog. That said, western toads have been known to breed in fish-free ponds possessing a bottom and elevation similar to the northwestern bog.

No reptile observations were noted during field studies conducted in 2003, 2004 and 2006. Mount Benson Regional Park is within the distributional range of four species of native reptiles, all of which have been recorded at elevations above 1000 m (St. John 2002). Suitable habitats for both the common and western terrestrial garter snake would be largely restricted to the margins of the bog in the northwest part of the site. The northwestern garter snake, the most common reptile in the region, is expected to inhabit forest edges, clearings and meadows within the new park. The northern alligator lizard, the only lizard native to the Island, is fairly common in the region. It is expected to inhabit the forested fringes of bedrock outcrops and cliffs, particularly where abundant woody debris is present as cover (Gregory and Campbell 1984).

Table 5. Mammal and herptile observations from Mt. Benson Regional Park and neighbouring areas.

Species	Type of Observation	Remarks
MAMMALS		
Cougar	tracks	Presumed travel/foraging habitat in broken country along ridgelines.
Black bear	scat	One spring scat comprised of grasses. Moderate berry production in older forests.
Black-tailed deer	tracks	Only a few signs of use seen in 2006.
Marten	scat	Two seen on abandoned logging roads in 2006.
Red squirrel	auditory, feeding sign	Several heard in older forests with a large component of fir.
Deer mouse	tracks	Track plated from 2004 fieldwork by Malaspina UC students.
AMPHIBIANS		
Western toad	visual	Adult seen in forest
Pacific treefrog	auditory	Calling near NW bog area
Northwestern salamander	visual	Documented larval form in NW bog

4.0 CONSERVATION ASSESSMENT

A commonly employed approach to assessing conservation values at a particular site is to identify a number of Valued Ecosystem Components (or VEC's) and rate the site's importance to them. Though bio-inventory is not complete, the level of existing information on the park's natural resource values is considered sufficient to rate nine VEC's. These encompass both general biodiversity values and the occurrence of rare and regionally uncommon elements.

4.1 Capture of Rare / Threatened Plants and Fungi

Mount Benson Regional Park rates moderately high for these VEC's. The study area supports one Provincially Blue-listed vascular plant, Macoun's groundsel (*Senecio macounii*), and is within the historical range of another, California-tea (*Rupertia physodes*; see Appendix B). Two other plants occurring within the park are considered by area naturalists as regionally uncommon; Rocky Mountain juniper (*Juniperis scopuloum*) and western white pine (*Pinus monticola*). Though not tracked by the Provincial Conservation Data Centre, the park also supports a type of mushroom considered locally uncommon by mycologists, the clustered blue chanterelle (*Polyozellus multiplex*).

4.2 Capture of Sensitive and Under-represented Plant Communities

Though the park includes large areas disturbed by logging and wildfire, it rates high for capture of Sensitive Ecosystems. The study area includes five Older Forest polygons, nine Terrestrial Herbaceous polygons, one Wetland, and at least one Sparsely Vegetated cliff ecosystem. Four of the Older Forest polygons capture Provincially Blue-Listed forest ecosystems (CWHmm2/01 and CWHmm2/03). Given the long history of logging in the region all Older Forest Polygons have considerable conservation value by virtue of providing structural habitat elements (e.g. cavity-bearing snags, large recumbent logs) which are generally in short supply in southeastern Vancouver Island.

In addition to the above, the strong topographic relief of Mt. Benson Regional Park has the effect of "compressing" ecological transition zones, creating an intergrading of montane and subalpine plant communities that is unique in the region.

4.3 Importance to "At-risk" and Regionally Uncommon Wildlife

In the absence of breeding-season data, the importance of the site to wildlife designated as "at-risk" was conservatively assessed as moderate. The site is used by one federally designated amphibian at risk, the western toad (*Bufo boreas*). One Provincially Red-Listed bird, the Queen Charlotte goshawk (*Accipiter gentilis laingi*) is known to forage in the park, along with a Blue-Listed raptor, the Western Screech-owl (*Otus kennicottii saturatus*). Six other bird species considered locally rare have been recorded on the site. The importance rating for this VEC could potentially be much higher, if evidence of breeding by any of the above species is documented in the study area.

4.4 General Biodiversity Values

Despite the incompleteness of inventory efforts, species lists compiled for this site indicate that Mount Benson Regional Park possesses considerable floral, faunal and fungal biodiversity. It supports 117 vascular plant species, 84 vertebrate species, and at least 33 species of fungi.

4.5 Landscape-level Considerations

Given its large area, its juxtaposition of open, forested and wetland habitats, and its low level of human presence, Mount Benson Regional Park would appear attractive to a wide variety of wildlife. Some of these, particularly carnivores, cannot meet all their habitat requirements in a single location and are forced to move across the landscape on a daily, weekly, or seasonal basis. The broken high country of the park provides appropriate travel cover for wide-ranging cougars and their primary prey, black-tailed deer, over much of the year. Tracts of forest in the park provide security cover to hunting and berry-producing areas, as well as potential denning habitat, for black bears and marten. These stands also facilitate seasonal migrations upslope (in winter) and downslope (in summer) by the resident blue grouse population. Forests surrounding the bog in the northwest part of the site likely function as important migration and dispersal corridors for several species of pond-breeding amphibians.

In light of the above information, it is the author's assessment that the overall conservation value of Mount Benson is high.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Conservation Values

The high overall conservation rating assigned to the study area was based on the bio-inventory information summarized below.

Table 6. Conservation values captured within Mt. Benson Regional Park.

Valued Ecosystem Component	Regional Importance Ratings	Rating Rationale
1. Vascular Plant Diversity	High	117 vascular plant species recorded to date
2. Rare / Uncommon Plants	Moderate-High	1 documented Blue-Listed plant; 2 locally uncommon species; 1 historically present Blue-Listed species.
3. Fungal Diversity	High	> 30 species recorded; many dependent on stable older-forest habitats.
4. Rare / Uncommon Fungi	Moderate	1 species considered rare present.
5. Vertebrate Diversity	High	At least 75 bird, 6 mammal, and 3 amphibian species present.
6. Rare / Uncommon Vertebrates	Moderate-High	1 Red-Listed bird, 1 Blue-Listed bird, and 6 locally rare birds present; potential breeding by Federally-designated at-risk amphibian.
7. Ecosystem Representation	Moderate	Site spans 2 Biogeoclimatic variants and possesses unusual "transition zone" features; includes 2 Blue-Listed forest ecosystems.
8. Sensitive Ecosystem Presence	High	16 ground-checked SEI Polygons present on site.
9. Habitat Connectivity	High	Site provides elevational and wetland-to-upland migration & dispersal corridors for wildlife.
Overall Conservation Value	High	

5.2 Recommendations

The following measures are recommended to protect and enhance natural resource values in Mt. Benson Regional Park:

1. Any future trail development or re-alignment should seek to avoid mapped sensitive ecosystems to the extent possible.
2. Trail consolidation and delineation (i.e. cairns or posts) is recommended along the summit ridgeline to protect the sensitive Terrestrial Herbaceous community there.
3. Consideration should be given to installing interpretive signage on the trails approaching the summit to educate park users on the uniqueness and fragility of plant communities at the summit.
4. Traditional uses of the site included hunting and ATV use, which are not compatible with sensitive ecosystem protection or the land's current status as parkland. Signage indicating park boundaries and forbidding hunting and motorized vehicle use should be posted along the main paths in the northeast and northwest part of the site.
5. Additional inventory is recommended to document breeding use of the site by amphibians and birds of prey. This might be done in cooperation with Malaspina University-College Resource Management Officer Technology Program.
6. Consideration should be given to seeding clearings with coastal native grass mixes, which will be commercially available in 2007, to increase forage production for herbivorous wildlife and provide competition for invasive exotic vegetation.

6.0 REFERENCES

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APPENDIX A

**Ground-truthing Field Data & Photos collected during
the Summer of 2006**

Mt. Benson Sensitive Ecosystem Ground-truthing Form

PROJECT			
DATE (mm/dd/yy)	24/07/06	PERSONNEL	CF, WH, DC
PLOT ID	VP1 - NW BOG	TYPE OF PLOT	20 m x 20 m
LOCATION	NW corner of study sight, plot @ S end of bog		
GROUND PHOTO	CF		
GPS POSITION	10U0422558	FC POLYGON DESC	Wetland
	5445782		
ELEV	870 m	ASPECT	NA
SLOPE POSITION	Middle slope	SLOPE (°)	NA
LANDFORM	Depression	SURFACE MAT.	Peat
MOISTURE REGIME	Poor drainage- bog	NUTRIENT REGIME	Poor
BGC ZONE/ VAR	CWHmm2	SITE SERIES	NA
STRUCTURAL STG	Shrub-herb		
COMMENTS			

A. Tree Layer	20 x 20		D. Ground Cover	% Cover
Species	% Cover	DBH Range	Bryophytes	NA
Subalpine Fir	10	27	Woody debris	
Western Hemlock	10	34	Leaf litter	
			Open Water	
			Total	
			(C + D = 100 %)	
Total Tree	20%			
B. Shrub Layer	5 x 5		HABITAT VALUES	
Species	% Cover	Utilization	Browse	VH
Yellow Cedar	8	2	Herbage	H
Sitka Alder	3	5	Berries	H
Western Hemlock	5	1	Arboreal lichen	NIL
Salmonberry	2	1	Snags/stubs	H
Shore Pine	5	2	CWD	M
Salal	3	5	Surf. Complexity	L
			MAMU Nesting	NIL
			Cover Values	
Total Shrub	26 %		Hiding	M
C1. Herb Layer	Centre Plot		Thermal:	L
Species	% Cover	Distrib. Code	Snow Int.	L
Labrador Tea	45	4	Travel	H
Buck bean	10	2		
Bunchberry	7	2	WILDLIFE	
			OBSERVATIONS	
Bog cranberry	10	4		
Viola	<1	1		
Starflower	<1	2		
bryophyte	75	7		

Juv W hemlock	1	1	
Juv shore Pine	2	1	
Total Plot			

C2. Herb Layer	North Plot		
Species	% Cover	Distrib. Code	
Yellow pond lily	30	5	
Buck bean	15	5	
White beak rush	10	4	
Slough sedge	1	1	
CWD	35		
Open Water	45		
Total Plot	56		
C3. Herb Layer	East Plot		
Species	% Cover	Distrib. Code	
Yellow pond Lily	30	5	
Labrador tea	5	2	
Buck bean	10	2	
Juv. Red alder	10	1	
Yellow cedar	30	1	
Open Water	8		
CWD	15		
Total Plot			
C4. Herb Layer	South Plot		
Species	% Cover	Distrib. Code	
Labrador tea	15	2	
Bunchberry	8	4	
Slough sedge	15	5	
bryophytes	10		
Salal	25	3	
Sitka alder	10	2	
Red cedar	15	1	
Western Hemlock	10	1	
Salmonberry	t	1	

CWD	15		
Total Plot			
C5. Herb Layer	West Plot		
Species	% Cover	Distrib. Code	
Sundew	5	5	
Asphodel	10	3	
Labrador Tea	20	5	
Buckbean	8	4	
Green Sedge	15	4	
Starflower	t	1	
Scoulers Willow	1	2	
bryophyte	55		
Open Water	2		
CWD	5		
Exposed soil	12		
Total Plot			

Comments:

Soil depth = >40-60 cm... peatty/boggy

Also at bog: White Pine, Red Cedar, Trailing Blackberry, Salmonberry, Narrow leaf cottongrass, bracken fern, horsetail, Scouler's willow

Whole bog: 40-50% open water, 28% water lily, 12% buckbean, 20% grass/sedge/rush, 2% CWD, <1% shade, 5% snags along water edge

Exp rock	5	5	
Leaf litter	15	4	
cwd	0		
Total Plot			

C2. Herb Layer		North Plot	
Species	% Cover	Distrib. Code	
Coastal strawberry	<1	1	
Spreading stonecrop	1	1	
Parsley fern	2	2	
Exp rock	97		
Total Plot			
C3. Herb Layer		East Plot	
Species	% Cover	Distrib. Code	
Coastal strawberry	1	3	
Spreading stonecrop	1	3	
kinnikinnick	40	3	
Dwarf Blueberry	3	3	
Exp rock	50		
Exp soil	3		
Total Plot			
C4. Herb Layer		South Plot	
Species	% Cover	Distrib. Code	
Rein orchid	<1	2	
Coastal strawberry	1	2	
grass	t	2	
cwd	0		
Leaf litter	5		
Total Plot			
C5. Herb Layer		West Plot	
Species	% Cover	Distrib. Code	
Yarrow	<1	1	
Oxeye daisy	<1	1	
kinnikinnick	40		

Dwarf Blueberry	7		
Willow	30		
Saskatoon	5		
Exp soil	3		
Leaf litter	10		
Total Plot			
Comments: Also at veg plot area = Hoary Rock Moss, Broom Moss, Punctured Rock Tripe, Birdsfoot Treefoil, Lingonberry, Also at peak area= Narrow-leaved Hawkweed, Tiger Lily, Woolly Pussytoes, Alpine willowherb?			

Mt. Benson Sensitive Ecosystem Ground-truthing Form

PROJECT			
DATE (mm/dd/yy)	08/06/06	PERSONNEL	JM, CF, WH
PLOT ID	VP3-PEAK-SW corn	TYPE OF PLOT	5 m x 5 m
LOCATION	sw corner of Mt. Benson peak, exp rock/conifer interface		
GROUND PHOTO	CF		
GPS POSITION	10U0423259	FC POLYGON DESC	Non-productive / Inoperable
	5444702		
ELEV	990 m	ASPECT	SSW
SLOPE POSITION	Upper	SLOPE (°)	5
LANDFORM	Crest	SURFACE MAT.	Soil pockets and exposed bedrock
MOISTURE REGIME	Moderately Dry	NUTRIENT REGIME	Medium
BGC ZONE/ VAR	CWHmm2	SITE SERIES	NA
STRUCTURAL STG	Shrub-herb	soil	Silty loam 0-15 cm
COMMENTS			

A. Tree Layer	20 x 20		D. Ground Cove	% Cover
Species	% Cover	DBH Range	Bryophytes	5
			Woody debris	0
			Leaf litter	0
			Exp. rock/soil	55
			Total	60 %
			(C + D = 100 %)	
Total Tree	0 %			
B. Shrub Layer	5 x 5		HABITAT VALUES	
Species	% Cover	Utilization	Browse	VH
Kinnikinnick	3	6	Herbage	L
Saskatoon	<1	5	Berries	H
Common juniper	1	3	Arboreal lichen	NIL
Willow	2	5	Snags/stubs	NIL
Dwarf blueberry	4	8	CWD	NIL
Shore Pine	12	3	Surf. Complexity	H
			MAMU Nesting	NIL
			Cover Values	
			Hiding	L
Total Shrub			Thermal:	L
			Snow Int.	L
C1. Herb Layer	Centre Plot		Travel	VH
Species	% Cover	Distrib. Code		
Coastal strawberry	2	2		
Yarrow	<1	3		
grasses	2	5	WILDLIFE OBSERVATIONS	
Dwarf Blueberry	35	8		

Total Plot			

C2. Herb Layer	North Plot		
Species	% Cover	Distrib. Code	
Coral root	<1	1	
Foamflower	<1	1	
Oregon grape	1	1	
Step moss	<1	1	
Red huckleberry	<1	1	
Red cedar	7	1	
Total Plot			
C3. Herb Layer	East Plot		
Species	% Cover	Distrib. Code	
salal	75	8	
Red huckleberry	<1	1	
Total Plot			
C4. Herb Layer	South Plot		
Species	% Cover	Distrib. Code	
huckleberry	20	6	
salal	15	6	
Yellow cedar	10	1	
Total Plot			
C5. Herb Layer	West Plot		
Species	% Cover	Distrib. Code	
clubmoss	<1	1	
Sword fern	2	1	
Red huckleberry	1	1	
Gooseberry	1	1	
Western hemlock	25	1	
Red cedar	15	1	
salal	3	2	
Exp rock	5		
Leaf litter	20		

Esp soil	15		
Total Plot			
Comments: Also in plot area: vanilla leaf, rattlesnake plantain, prince's pine, twinflower, stream violet, grasses			

Mt. Benson Sensitive Ecosystem Ground-truthing Form

PROJECT			
DATE (mm/dd/yy)	08/06/06	PERSONNEL	JM, CF, WH
PLOT ID	VP5-SE OUTCROP	TYPE OF PLOT	20 m x 20 m
LOCATION	Outcrop at SE edge of property		
GROUND PHOTO	CF		
GPS POSITION	10U0424749 5444307	FCPOLYGON DESCR	FPI 320
ELEV	880 m (alt)	ASPECT	NA
SLOPE POSITION	Upper	SLOPE (°)	NA
LANDFORM	Knoll	SURFACE MAT.	Organics over Bedrock
MOISTURE REGIME	Moderately Dry	NUTRIENT REGIME	Very Poor
BGC ZONE/ VAR	CWHmm2	SITE SERIES	02
STRUCTURAL STG	Young Forest	Soil	NA
COMMENTS			

A. Tree Layer	20 x 20		D. Ground Cove	% Cover
Species	% Cover	DBH Range	Bryophytes	40
Shore Pine	3	6.0-34.5	Woody debris	<1
			Leaf litter	20
Juv pine & fir	2		Exp. rock/soil	40
			Total	
			(C + D = 100 %)	
Total Tree	%			
B. Shrub Layer	5 x 5		HABITAT VALUES	
Species	% Cover	Utilization	Browse	L
			Herbage	L
			Berries	NIL
			Arboreal lichen	NIL
			Snags/stubs	H
			CWD	L
			Surf. Complexity	H
			MAMU Nesting	NIL
			Cover Values	
			Hiding	L
Total Shrub			Thermal:	L
			Snow Int.	L
C1. Herb Layer	Centre Plot		Travel	H
Species	% Cover	Distrib. Code		
Wood groundsel	<1	1	WILDLIFE OBSERVATIONS	
Broom moss	3	5		
Hoary rock moss	<1	5		
Punctured rock tripe	25	8		
Pipe cleaner moss	1	3		

Hair grass	<1	1	
Leaf litter	5		
Exp rock	65		
Total Plot			

C2. Herb Layer	North Plot		
Species	% Cover	Distrib. Code	
Coastal reindeer lichen	2	3	
Lipstick cladonia	1	5	
Broom moss	2	5	
Poa arcticata	10	5	
Pussytoes (alpine?)	<1	1	
Hoary rock moss	1	1	
Alpine willowherb?	<1	3	
Moss (1 type)	5	5	
Leaf litter	69		
Exp rock	10		
Total Plot			
C3. Herb Layer	East Plot		
Species	% Cover	Distrib. Code	
Hoary rock moss	5	5	
Coastal reindeer lichen	<1	1	
Lipstick cladonia	2	3	
Black rock tripe	5	6	
Moss (1 type)	5	3	
Pipe cleaner moss	<1	3	
Leaf litter	32		
Exp rock	50		
Total Plot			
C4. Herb Layer	South Plot		
Species	% Cover	Distrib. Code	
Coastal Reindeer lichen	<1	2	
Punctured rock tripe	1	5	
Lichens (3 types)	25	6	
Moss (1 type)	10	6	
Leaf litter	5		

Exp rock	56		
Total Plot			
C5. Herb Layer	West Plot		
Species	% Cover	Distrib. Code	
Lipstick cladonia	2	6	
Broom moss	2	5	
Coastal strawberry	3	5	
Coastal reindeer lichen	1	3	
Agrostis exarata	<1	1	
Punctured rock tripe	2	6	
Hoary rock moss	1	3	
Moss (1 type)	1	3	
Leaf litter	22		
Exp rock	60		
Total Plot			
Comments: Also at veg plot site: parsley fern, sword fern, Douglas fir, salal, yarrow, narrow leaved hawkweed, mountain ash,			

Mt. Benson Sensitive Ecosystem Ground-truthing Form

PROJECT			
DATE (mm/dd/yy)	08/07/06	PERSONNEL	JM, CF, WH
PLOT ID	VP6-NE BLUFF	TYPE OF PLOT	20 m x 20 m
LOCATION	NE CORNER of property		
GROUND PHOTO	CF		
GPS POSITION	10U0424850 5445187	FCPOLYGON DESCR	Non-productive / Inoperable
ELEV	580 m (alt)	ASPECT	North
SLOPE POSITION	Middle	SLOPE (°)	40°
LANDFORM	Bluff	SURFACE MAT.	Organics over bedrock
MOISTURE REGIME	Very Dry	NUTRIENT REGIME	Very Poor
BGC ZONE/ VAR STRUCTURAL STG	CWHxm2	SITE SERIES soil	02
COMMENTS			

A. Tree Layer	20 x 20		D. Ground Cove	% Cover
Species	% Cover	DBH Range	Bryophytes	30
Shore Pine	15	9-23	Woody debris	1
Arbutus	2	15	Leaf litter	10
Douglas-fir	3	15 - 25	Exp. rock/soil	3
			Total	44 %
			(C + D = 100 %)	
Total Tree	20%			
B. Shrub Layer	5 x 5		HABITAT VALUES	
Species	% Cover	Utilization	Browse	H
Juv Red cedar	1		Herbage	L
Juv Douglas fir	1		Berries	H
Juv Shore pine	1		Arboreal lichen	NIL
salal	20		Snags/stubs	M
oceanspray	3		CWD	M
kinnikinnick	7		Surf. Complexity	H
Rosa acicularis	<1		MAMU Nesting	NIL
			Cover Values	
			Hiding	M
Total Shrub	35		Thermal:	L
			Snow Int.	L
C1. Herb Layer	Centre Plot		Travel	H
Species	% Cover	Distrib. Code		
Yarrow	<1	4		
Coastal strawberry	<1	2	WILDLIFE OBSERVATIONS	
Timber Oat grass	5	5		
Western fescue	<1	5		

Broom moss	20	6	
Black rock tripe	4	5	
Lipstick cladonia	<1	3	
Exp rock	5		
Leaf	65		
Total Plot			

C2. Herb Layer		North Plot	
Species	% Cover	Distrib. Code	
Western fescue	3	5	
Licorice fern	<1	2	
Menzies neckara	45	8	
Broom moss	10	3	
Lichen (1type)	2	3	
Leaf litter	36		
Exp rock	8		
Total Plot			
C3. Herb Layer		East Plot	
Species	% Cover	Distrib. Code	
Broom moss	6	5	
Coastal strawberry	<1	1	
False pixie cup	<1	1	
Menzies neckara	25	8	
Oceanspray	<1	1	
Leaf litter	55		
CWD	1		
Total Plot			
C4. Herb Layer		South Plot	
Species	% Cover	Distrib. Code	
Rosa acicularis	<1	1	
Broom moss	15	8	
Hoary rock moss	50	8	
Leaf litter	23		
Exp rock	2		

Total Plot			
C5. Herb Layer	West Plot		
Species	% Cover	Distrib. Code	
Step moss	1	3	
Broom moss	30	8	
Oregon beaked moss	2	3	
Salal	35	6	
CWD	8		
Leaf litter	22		
Exp rock	2		
Total Plot			
Comments: Also at plot sight: Rattlesnake plantain, salix sp, sm. flowered alumroot, Oregon grape, red flowering currant, mountain harebell, parsley fern far west of rock bluff: GPS 10U0424712, 5445253 ; MAP10U0424527, 5445350 east : GPS 10U0424975, 5445163			

Mt. Benson Sensitive Ecosystem Ground-truthing Form

PROJECT			
DATE (mm/dd/yy)	08/07/06	PERSONNEL	J.Materi, C. Forrest, Wam H.
PLOT ID	VP7-CENTRE BLUFF	TYPE OF PLOT	20 m x 20 m
LOCATION	Centre rockcrop below summit		
GROUND PHOTO	CF		
GPS POSITION	10U0423453 5445036	FCPOLYGON DESCR	Non-Productive / Inoperable
ELEV	920 m (alt) 877 m (gps)	ASPECT	N
SLOPE POSITION	Upper	SLOPE (°)	32%
LANDFORM	Knoll	SURFACE MAT.	Organic veneer ov bedrock
MOISTURE REGIME	Moderately Dry	NUTRIENT REGIME	Very Poor
BGC ZONE/ VAR	CWHmm2	SITE SERIES	02
STRUCTURAL STG	Mature Forest / outcrop	soil	
COMMENTS			

A. Tree Layer	20 x 20		D. Ground Cove	% Cover
Species	% Cover	DBH Range	Bryophytes	20
Shore Pine	12	15.5-31.5	Woody debris	1
Yellow Cedar	2		Leaf litter	15
White Pine	2	22.5	Exp. rock/soil	25
Mtn Hemlock	5		Total	61 %
Douglas fir	2	52	(C + D = 100 %)	
Total Tree	23%		HABITAT VALUES	
B. Shrub Layer	5 x 5		Browse	M
Species	% Cover	Utilization	Herbage	VL
Douglas fir	1		Berries	M
salal	18		Arboreal lichen	L
kinnikinnick	2		Snags/stubs	H
Yellow cedar	3		CWD	L
Salix sp	<1		Surf. Complexity	H
			MAMU Nesting	NIL
Total Shrub	25		Cover Values	
			Hiding	M
			Thermal:	M
			Snow Int.	L
C1. Herb Layer	Centre Plot		Travel	H
Species	% Cover	Distrib. Code		
Reindeer lichen	5	5		
Hoary rock moss	25	8	WILDLIFE OBSERVATIONS	
Broom moss	5	5		
kinnikinnick	1	4		

salal	3	5	
Exp rock	7		
Leaf	53		
Total Plot			

C2. Herb Layer		North Plot	
Species	% Cover	Distrib. Code	
Narrowleaved hawkweed	1	1	
Coastal reindeer lichen	12	6	
Menzies neckara	15	6	
salal	4	5	
Black rock moss	12	6	
Saxifrage (un-id)	<1	1	
Leaf litter	41		
Exp rock	14		
Total Plot			
C3. Herb Layer		East Plot	
Species	% Cover	Distrib. Code	
Broom moss	20	8	
Yellow cedar	1	1	
Black huckleberry	<1	1	
salal	15	5	
Leaf litter	55		
CWD	8		
Total Plot			
C4. Herb Layer		South Plot	
Species	% Cover	Distrib. Code	
kinnikinnick	10	6	
Reindeer lichen	13	6	
Hoary rockmoss	2	3	
Black rock moss	2	5	
Menzies necara	10	6	
salal	≤1	1	
Broom moss	3	3	
Leaf litter	42		
Exp rock	16		

CWD	1		
Total Plot			
C5. Herb Layer	West Plot		
Species	% Cover	Distrib. Code	
Black rock tripe	<1	3	
False pixiecup lichen	<1	3	
Black rock moss	3	3	
Yellow cedar	4	2	
salal	75	8	
Leaf litter	14		
Exp rock	3		
Total Plot			
Comments: Also at plot sight: Rattlesnake plantain, Have handwritten list of gsp co-ords for periphery of outcrop			

Mt. Benson Sensitive Ecosystem Ground-truthing Form

PROJECT			
DATE (mm/dd/yy)	08/07/06	PERSONNEL	J.Materi,C.Forrest, Wam H.
PLOT ID	VP8-CENTRE OLDGROWTH	TYPE OF PLOT	20 m x 20 m
LOCATION	Centre old growth stand, below rockcrop - below summit		
GROUND PHOTO			
GPS POSITION	10U0423512 5445055	FCPOLYGON DESCR	HF (CyCw) 921
ELEV	900 m (alt) 870 m (gps)	ASPECT	NA
SLOPE POSITION	Upper	SLOPE (°)	NA
LANDFORM	Bench	SURFACE MAT.	Colluvial
MOISTURE REGIME	Fresh	NUTRIENT REGIME	Medium
BGC ZONE/ VAR	CWHmm2	SITE SERIES	01
STRUCTURAL STG	Old growth	soil	Clay loam
COMMENTS			

A. Tree Layer	20 x 20		D. Ground Cove	% Cover
Species	% Cover	DBH Range	Bryophytes	56
Red Cedar	1	9.5-22.5	Woody debris	4
Western Hemlock	34	18.0-82.5	Leaf litter	38
Douglas fir	5		Exp. rock/soil	2
			Total	100 %
Total Tree	40%		(C + D = 100 %)	
			HABITAT VALUES	
B. Shrub Layer	5 x 5		Browse	H
Species	% Cover	Utilization	Herbage	L
Red huckleberry	2		Berries	M
salal	47		Arboreal lichen	M
kinnikinnick			Snags/stubs	H
Y. cedar & Mtn. hemlock	6		CWD	H
			Surf. Complexity	M
			MAMU Nesting	M
Total Shrub	55		Cover Values	
			Hiding	H
			Thermal:	H
			Snow Int.	M
C1. Herb Layer	Centre Plot		Travel	M
Species	% Cover	Distrib. Code		
Coralroot (striped?)	<1	1		
Pipe cleaner moss	50	8	WILDLIFE OBSERVATIONS	
Black huckleberry	2	2		

Red huckleberry	2	1	
salal	30	6	
CWD	2		
Leaf litter	13		
Total Plot			

C2. Herb Layer	North Plot		
Species	% Cover	Distrib. Code	
Pipecleaner moss	15	6	
Broom moss	8	3	
Red huckleberry	15	3	
salal	35	6	
Western hemlock	5	3	
Black huckleberry	<1	1	
Lipstick cladonia	2	5	
Leaf litter	10		
Exp soil	20		
CWD	15		
Total Plot			
C3. Herb Layer	East Plot		
Species	% Cover	Distrib. Code	
twinlineer	<1	1	
Pipecleaner moss	80	9	
Black huckleberry	<1	1	
Red huckleberry	10	5	
salal	17	6	
Leaf litter	3		
Total Plot			
C4. Herb Layer	South Plot		
Species	% Cover	Distrib. Code	
twinlineer	3	3	
Pipecleaner moss	40	7	
salal	45	8	
Leaf litter	12		
Total Plot			

C5. Herb Layer	West Plot		
Species	% Cover	Distrib. Code	
salal	75	9	
Red huckleberry	10	3	
CWD	1		
Leaf litter	14		
Total Plot			
Comments: Also at plot site: oval leaved blueberry, un-id sedge			

Mt. Benson Sensitive Ecosystem Ground-truthing Form

PROJECT			
DATE (mm/dd/yy)	09/16/06	PERSONNEL	J. Materi, E. Pilyk
PLOT ID	VP9	TYPE OF PLOT	5 m Radius
LOCATION	Older forest south of NW Bog		
GROUND PHOTOS	JM #3 - # 7		
GPS POSITION – E	10U0422514	FCPOLYGON	HF(CyCw) 921
N	5445667	DESCR	
ELEV	777m (alt) / 782 m (gps)	ASPECT	NA
SLOPE POSITION	Crest	SLOPE (°)	NA
LANDFORM	Knoll	SURFACE MAT.	Organic veneer over bedrock
MOISTURE REGIME	Slightly Dry	NUTRIENT REGIME	Poor
BGC ZONE/ VAR	CWH mm2	SITE SERIES	03
STRUCTURAL STG	Older Forest	SOIL	
COMMENTS	Patchy forest w/ abundant white pine		

A. Tree Layer	20 x 20		D. Ground Cove	% Cover
Species	% Cover	DBH Range (cm)	Bryophytes	12
Mtn. Hemlock	12	17 - 70	Woody debris	3
W. White Pine	3	15- 27	Leaf litter	10
			Exp. rock/soil	0
			Total	25 %
Total Tree	15%		(C + D = 100 %)	
			HABITAT VALUES	
B. Shrub Layer	5 x 5		Browse	VH
Species	% Cover		Herbage	NIL
Yellow cedar	17		Berries	H
W. Hemlock	25		Arboreal lichen	VH
Salal	75		Snags/stubs	M
Douglas-fir	<1		CWD	VH
Red Huckleberry	<1		Surf. Complexity	H
W. White Pine	< 1		MAMU Nesting	L
Dull Oregon grape	< 1		Cover Values	
			Hiding	H
Total Shrub	117 %		Thermal:	L
			Snow Int.	L
C1. Herb Layer	Centre Plot		Travel	M
Species	% Cover	Distrib. Code		
No herb cover				
			WILDLIFE OBSERVATIONS	
			B- STJA auditory	
			M-TAHU feeding sign	

Mt. Benson Sensitive Ecosystem Ground-truthing Form

PROJECT			
DATE (mm/dd/yy)	09/16/06	PERSONNEL	J. Materi, E. Pilyk
PLOT ID	VP10	TYPE OF PLOT	5 m Radius
LOCATION	Rock outcrop in east-central area by clear-cuts		
GROUND PHOTOS	JM #12 - # 16		
GPS POSITION – E N	10U0424390 5444706	FCPOLYGON DESCR	FH 320
ELEV	780 m (alt)	ASPECT	NA
SLOPE POSITION	Crest	SLOPE (°)	NA
LANDFORM	Knoll	SURFACE MAT.	Organic veneer over bedrock
MOISTURE REGIME	Slightly Dry	NUTRIENT REGIME	Poor
BGC ZONE/ VAR	CWH mm2	SITE SERIES	03
STRUCTURAL STG	Shrub-herb	SOIL	
COMMENTS	Fringing forest w/ mature and old trees		

A. Tree Layer	20 x 20		D. Ground Cove	% Cover
Species	% Cover	DBH Range (cm)	Bryophytes	60
W. Hemlock	3	15 – 22	Woody debris	10
Yellow Cedar	2	20	Leaf litter	5
			Exp. rock/soil	25
			Total	100 %
Total Tree	5%		(C + D = 100 %)	
			HABITAT VALUES	
B. Shrub Layer	5 x 5		Browse	M
Species	% Cover		Herbage	L
Shore Pine	7		Berries	L-M
Yellow cedar	2		Arboreal lichen	L
Douglas-fir	< 1		Snags/stubs	H
Salal	5		CWD	M
R. Mtn. Juniper	<1		Surf. Complexity	H
Red Huckleberry	1		MAMU Nesting	NIL
			Cover Values	
			Hiding	M
Total Shrub	27 %		Thermal:	L
			Snow Int.	L
C1. Herb/Ground Layer	Centre Plot		Travel	H
Species	% Cover	Distrib. Code		
C. Reindeer Lichen	10	5		
Broom Moss	2	5	WILDLIFE OBSERVATIONS	
Lipstick Cladonia	<1	3		
J. Haircap Moss	<1	3		
Total Plot	12%			

C2. Herb/Ground Layer	North Plot		
Species	% Cover	Distrib. Code	
C. Reindeer Lichen	9	5	
Broom Moss	5	5	
Lipstick Cladonia	2	5	
J. Haircap Moss	<1	3	
Cup Fungi	<1	4	
Hoary Rock Moss	1	3	
Unid'd moss	<1	3	
Total Plot	17 %		
C3. Herb/Ground Layer	East Plot		
Species	% Cover	Distrib. Code	
C. Reindeer Lichen	25	8	
Broom Moss	<1	3	
Lipstick Cladonia	<1	2	
J. Haircap Moss	1	5	
Hoary Rock Moss	1	3	
Total Plot	27 %		
C4. Herb/Ground Layer	South Plot		
Species	% Cover	Distrib. Code	
C. Reindeer Lichen	10	6	
Lipstick Cladonia	4	5	
J. Haircap Moss	6	6	
Unid'd moss	2	5	
Total Plot	22%		
C5. Herb/Ground Layer	West Plot		
Species	% Cover	Distrib. Code	
C. Reindeer Lichen	60	8	
Lipstick Cladonia	1	4	
J. Haircap Moss	<1	4	
Total Plot	61 %		

Mt. Benson Sensitive Ecosystem Ground-truthing Form

PROJECT			
DATE (mm/dd/yy)	09/17/06	PERSONNEL	J. Materi
PLOT ID	VP11	TYPE OF PLOT	5 m Radius
LOCATION	Rock outcrop in north-central area		
GROUND PHOTOS	JM #17 - # 21		
GPS POSITION – E N	10U0424220 5445230	FCPOLYGON DESCR	Non-productive / Inoperable
ELEV	680 m (alt)	ASPECT	NA
SLOPE POSITION	Crest	SLOPE (°)	NA
LANDFORM	Knoll	SURFACE MAT.	bedrock
MOISTURE REGIME	Very Dry	NUTRIENT REGIME	Poor
BGC ZONE/ VAR	CWH xm2	SITE SERIES	NA
STRUCTURAL STG	Shrub-herb	SOIL	NA
COMMENTS	Fringing mid-seral forest		

A. Tree Layer	20 x 20		D. Ground Cove	% Cover
Species	% Cover	DBH Range (cm)	Bryophytes	60
Douglas-fir	22	15 – 23	Woody debris	3
Shore Pine	2	15	Leaf litter	10
Western Hemlock	1	13	Exp. rock/soil	27
			Total	100 %
Total Tree	25%		(C + D = 100 %)	
			HABITAT VALUES	
B. Shrub Layer	5 x 5		Browse	M
Species	% Cover		Herbage	NIL
Douglas-fir	7		Berries	M
Red Huckleberry	<1		Arboreal lichen	NIL
Salal	5		Snags/stubs	L
Yellow Cedar	3		CWD	M
Willow	<1		Surf. Complexity	H
			MAMU Nesting	NIL
			Cover Values	
			Hiding	L
Total Shrub	15 %		Thermal:	L
			Snow Int.	L
C1. Herb/Ground Layer	Centre Plot		Travel	H
Species	% Cover	Distrib. Code		
Hoary Rock Moss	50	8	WILDLIFE OBSERVATIONS	
Lipstick Cladonia	<1	5	B-BLGR visual	
J. Haircap Moss	<1	2		
Total Plot	50%			

C2. Herb/Ground Layer	North Plot		
Species	% Cover	Distrib. Code	
Wild Strawberry	<1	2	
Frog Pelt Lichen	<1	3	
Juniper Haircap Moss	9	3	
Cup Fungi	1	3	
Hoary Rock Moss	60	8	
C. Reindeer Lichen	1	2	
Total Plot	71 %		
C3. Herb/Ground Layer	East Plot		
Species	% Cover	Distrib. Code	
C. Reindeer Lichen	1	3	
Hoary Rock Moss	80	9	
Total Plot	81 %		
C4. Herb/Ground Layer	South Plot		
Species	% Cover	Distrib. Code	
Hoary Rock Moss	95	9	
Wild Strawberry	<1	2	
Lipstick Cladonia	<1	2	
Total Plot	95%		
C5. Herb/Ground Layer	West Plot		
Species	% Cover	Distrib. Code	
Hoary Rock Moss	95	9	
Lipstick Cladonia	<1	2	
Juniper Haircap Moss	<1	3	
Roadside Rock Moss	<1	3	
Total Plot	95 %		

Mt. Benson Sensitive Ecosystem Ground-truthing Form

PROJECT			
DATE (mm/dd/yy)	09/17/06	PERSONNEL	J. Materi
PLOT ID	VP12	TYPE OF PLOT	5 m Radius
LOCATION	East-central forest in SEI Polygon N0303		
GROUND PHOTOS	JM #16 - # 17		
GPS POSITION – E N	10U0424646 5445038	FCPOLYGON DESCR	HF(CyCw) 921
ELEV	630 m (alt)	ASPECT	Northeast
SLOPE POSITION	Middle	SLOPE (°)	25
LANDFORM	Slope	SURFACE MAT.	Organic veneer over bedrock
MOISTURE REGIME	Moderately Dry	NUTRIENT REGIME	Very Poor
BGC ZONE/ VAR	CWH xm2	SITE SERIES	03
STRUCTURAL STG	Older Forest	SOIL	NA
COMMENTS	Dense pole-sapling fir in understorey following fire		

A. Tree Layer	20 x 20		D. Ground Cove	% Cover
Species	% Cover	DBH Range (cm)	Bryophytes	75
Douglas-fir	30	13 – 58	Woody debris	3
			Leaf litter	20
			Exp. rock/soil	2
			Total	100 %
Total Tree	30%		(C + D = 100 %)	
HABITAT VALUES				
B. Shrub Layer	5 x 5		Browse	VH
Species	% Cover		Herbage	NIL
Yellow cedar	5		Berries	L-M
W. Hemlock	5		Arboreal lichen	L
Salal	20		Snags/stubs	H
Douglas-fir	30		CWD	M
Red Huckleberry	<1		Surf. Complexity	H
			MAMU Nesting	NIL
			Cover Values	
			Hiding	H
Total Shrub	60 %		Thermal:	L
			Snow Int.	L
C1. Herb Layer	Centre Plot		Travel	M
Species	% Cover	Distrib. Code		
No herb cover				
O. Beaked Moss	25		WILDLIFE OBSERVATIONS	
Step Moss	50			
Frog Pelt Lichen	<1		M-TAHU visual	
Total Ground Cover	75 %			



VP #1 – General



VP #1 – Plot Centre



VP #1 – South Corner



VP #3 – General



VP #3 – Plot Centre



VP #3 – West Corner



VP #4 – Plot Centre



VP #4 – East Corner



VP #4 – North Corner



VP #5 – Plot Centre



VP #5 – East Corner



VP #5 – South Corner



VP #6 – Plot Centre



VP #6 – East Corner



VP #6 – West Corner



VP #7 – Plot Centre



VP #7 – South Corner



VP #7 – West Corner



VP #8 – General



VP #8 – Plot Centre



VP #8 – East Corner



VP #9 – General



VP #9 – Plot Centre



VP #9 – East Corner



VP #10 – General



VP #10 – Plot Centre



VP #10 – North Corner



VP #11 – General



VP #11 – Plot Centre



VP #11 – South Corner



VP #12 – General

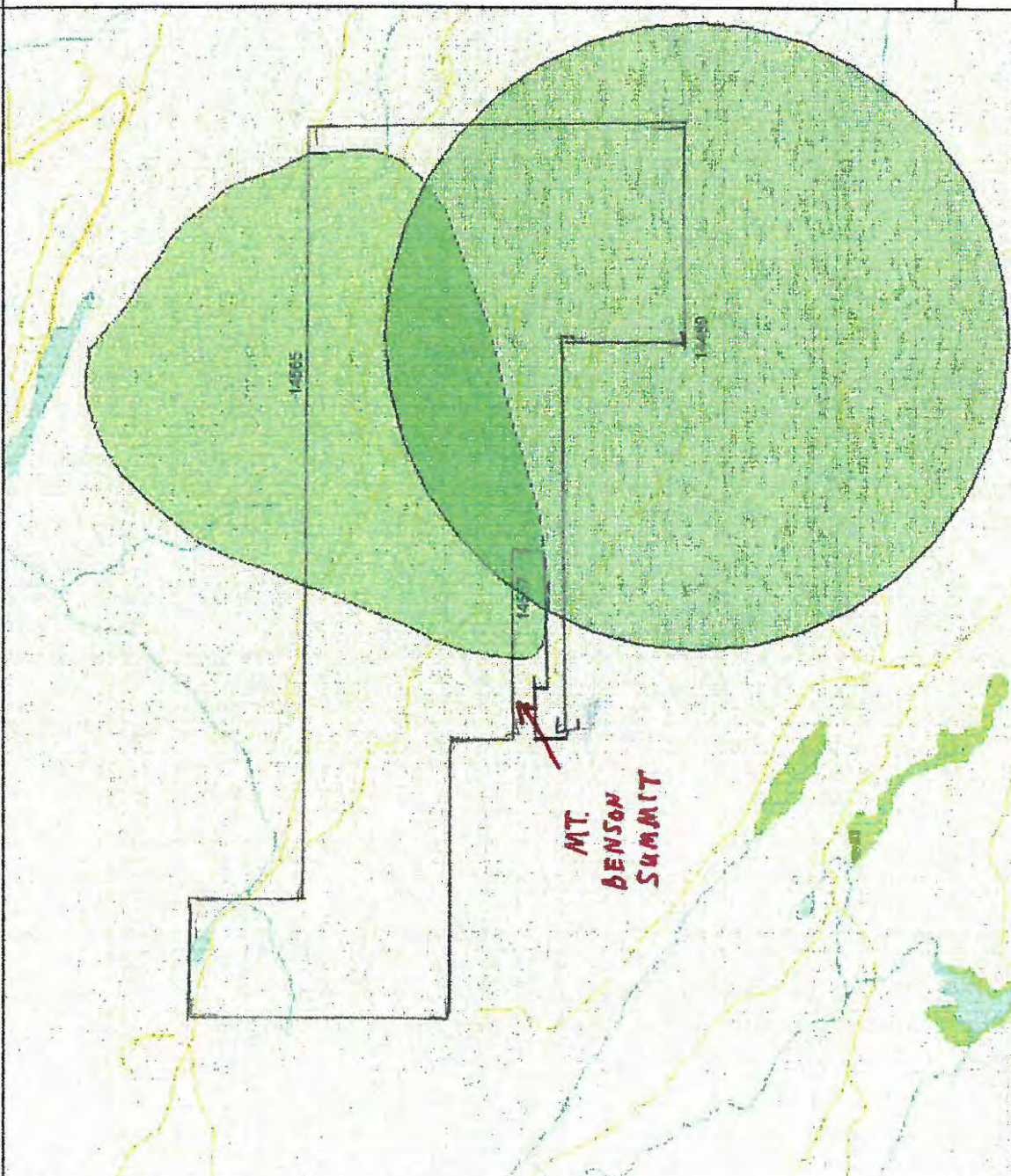


VP #12 – Plot Centre

APPENDIX B

Conservation Data Centre Rare Element Occurrence Records for Vascular Plants and Plant Community Tracking List

Map created Mon Sep 11 16:54:04 PDT 2006



0 0.4km

Map Center: 124° 2' 52" W, 49° 9' 1" N

Legend

- Element Occurrence Areas - CDC
- Annual - 2/1/2006
- Airfield - Impervious
- Plant - Vascular
- Plant - Non Vascular
- Plant Association
- Record Line
- Other
- Transportation - Points (TRIP)
- Revised
- Transportation - Lines (TRIL)
- Airfield
- Airport
- Airport
- Airport
- Approved/Discontinued
- Ferry Route
- Road (Gravel Undivided) - 1 Lane
- Road (Gravel Undivided) - 2 Lanes
- Road (Gravel Undivided) - U/C - 1 Lane
- Road (Gravel Undivided) - U/C - 2 Lanes
- Road (Paved Divided) - Not Elevated - 1 Lane Each Way
- Road (Paved Divided) - Not Elevated - 2 Lanes Each Way
- Road (Paved Divided) - U/C - Not Elevated - 1 Lane
- Road (Paved Divided) - U/C - Not Elevated - 2 Lanes
- Road (Paved Undivided) - Not Elevated - 1 Lane
- Road (Paved Undivided) - Not Elevated - 2 Lanes
- Road (Paved Undivided) - U/C - Not Elevated - 4 Lanes
- Road (Paved Undivided) - U/C - Not Elevated - 3 Lanes
- Road Unimproved
- Lul (Roadway)
- Embankment/Fill (Roadway)
- Trail
- Bridge - Foot
- Bridge - Trestle
- Tunnel
- Bridge
- Rail Line - Double Track
- Rail Line - Multiple Track
- Rail Line - Single Track
- Rail Line - Abandoned Track
- Spur
- Transportation - Airfield (ESIA)
- Air Facility
- Airport
- Airport
- Abandoned Airfield
- Revised
- Water - Points (TRIP)
- Revised
- Drain
- Revised Land - Inundated
- Revised

Scale: 1:19,999

DO NOT USE FOR NAVIGATION



British Columbia
Conservation Data Centre

Element Occurrence Record (14565)

September 11, 2006

Rupertia physodes
(California-tea)

Please see http://srmwww.gov.bc.ca/cdc/gls/ea_data_fields.htm for definitions.

This is a summary report. For a complete record contact the CDC (cdcdata@victorial.gov.bc.ca).

Element Type:

Vascular Plant

Status:

Global: G4

Provincial: S3

Taxonomic Class:

Dicots

COSEWIC:

List: Blue

Representational Accuracy:

Location / Directions:

MOUNT BENSON, NORTHEAST OF

Element Occurrence Data: (Last Observation: 1950-06-07)

None.

General Description:

EO Type:

Habitat Keyword:

TERRESTRIAL

EO Rank:

Comments:

Vegetation Zone:

Montane

Element Occurrence References:

(O91UBC01BCCA) University of British Columbia. Dep. Bot., Dep. Zool., Biol. Sci. Bldg., 6270 Univ. Blvd., Vancouver, BC.



British Columbia
Conservation Data Centre

Element Occurrence Record (14489)

September 11, 2006

Senecio macounii
(Macoun's Groundsel)

Please see http://srmwww.gov.bc.ca/cdc/gis/eo_data_fields.htm for definitions.

This is a summary report. For a complete record contact the CDC (cdodata@victoria1.gov.bc.ca).

Element Type:

Vascular Plant

Status:

Global: G5

Provincial: S3

COSEWIC:

List: Blue

Taxonomic Class:

Dicots

Representational Accuracy:

Location / Directions:

MOUNT BENSON

Element Occurrence Data: (Last Observation: 1977-10-09)

Gravelly cut along logging road and on ledges and crevices of bare rock cliffs, southwest slope.

General Description:

EO Type:

Habitat Keyword:

TERRESTRIAL; ROADSIDE; ROCK OUTCROP

EO Rank:

Comments:

Vegetation Zone:

Montane

Element Occurrence References:

(O92PMV01BCCA) Royal British Columbia Museum, Minist. Tourism, and the Minist. Responsible for Cult., 675 Belleville St., Victoria, BC, V8V 1X4.



British Columbia
Conservation Data Centre

Element Occurrence Record (14557)

September 11, 2006

Rupertia physodes
(California-tea)

Please see http://srmwww.gov.bc.ca/cdc/gis/eo_data_fields.htm for definitions.

This is a summary report. For a complete record contact the CDC (cdcddata@victoria1.gov.bc.ca).

Element Type:

Vascular Plant

Status:

Global: G4

Provincial: S3

Taxonomic Class:

Dicots

COSEWIC:

List: Blue

Representational Accuracy:

Location / Directions:

NANAIMO

Element Occurrence Data: (Last Observation: 1964-07-09)

Thickets and open slopes in Nanaimo and vicinity.

General Description:

EO Type:

Habitat Keyword:

TERRESTRIAL; SHRUBLAND

EO Rank:

Comments:

Vegetation Zone:

Lowland

Element Occurrence References:

(O91PMV01BCCA) Royal British Columbia Museum. 1991. B.C. Minist. Tourism, and the Minist. Responsible for Cult. 675 Belleville Street, Victoria, BC. V8V 1X4.

BC Species and Ecosystems Explorer Search Results

Scientific Name	English Name	Status			
		Global	Provincial	BC Status	BGC
<i>Abies amabilis</i> - <i>Thuja plicata</i> / <i>Rubus spectabilis</i> Moist Maritime 2	amabilis fir - western redcedar / salmonberry Moist Maritime 2	GNR	S2S3	Blue	CWHmm2/08
<i>Pseudotsuga menziesii</i> - <i>Tsuga heterophylla</i> / <i>Gaultheria shallon</i> Moist Maritime	Douglas-fir - western hemlock / salal Moist Maritime	GNR	S3	Blue	CWHmm1/02 CWHmm2/02
<i>Thuja plicata</i> - <i>Chamaecyparis nootkatensis</i> / <i>Coptis asplenifolia</i> Moist Maritime 2	western redcedar - yellow-cedar / spleenwort-leaved goldthread Moist Maritime 2	GNR	S2S3	Blue	CWHmm2/07
<i>Thuja plicata</i> - <i>Tsuga heterophylla</i> / <i>Polystichum munitum</i>	western redcedar - western hemlock / sword fern	GNR	S3?	Blue	CWHmm1/04 CWHmm2/04 CWHvm1/04 CWHvm2/04
<i>Tsuga heterophylla</i> - <i>Abies amabilis</i> / <i>Blechnum spicant</i> Moist Maritime	western hemlock - amabilis fir / deer fern Moist Maritime	GNR	S2	Red	CWHmm1/06 CWHmm2/06
<i>Tsuga heterophylla</i> - <i>Abies amabilis</i> / <i>Rhytidopsis robusta</i>	western hemlock - amabilis fir / pipecleaner moss	GNR	S3	Blue	CWHmm1/01 CWHmm2/01
<i>Tsuga heterophylla</i> - <i>Thuja plicata</i> / <i>Gaultheria shallon</i> Moist Maritime 2	western hemlock - western redcedar / salal Moist Maritime 2	GNR	S3	Blue	CWHmm2/03

Search Summary

Time Performed Wed Sep 13 14:13:32 PDT 2006

Results 7 records

Search Criteria Ecological Communities
AND BC Conservation Status: Red List (Extirpated, Endangered, or Threatened) OR Blue List (Special Concern)
AND BGCs: CWHmm2*
Sort Order: Scientific Name Ascending

Notes 1. Citation: B.C. Conservation Data Centre. 2006. BC Species and Ecosystems Explorer. B.C. Minist. of Environ. Victoria, BC. Available: <http://srmapps.gov.bc.ca/apps/eswp/> (accessed [enter date accessed]).

2. Results reflect a 2004 review of ecological community Conservation Status Ranks. Additions to the Red- and Blue- Lists include ecological communities previously considered secure and ecological communities recently described from new inventory data.

Biogeoclimatic Site Unit(s): This column indicates the BGC unit(s) on which each ecological community is known to occur (future inventories may indicate range extensions). The two digit number following the slash (01 and up) indicates that the ecological community occurs on a site series that is part of the B.C. Ministry of Forests (MOF) site series classification (see [MOF Regional Field Guides to Site Identification and Interpretation](#) for more information). A two digit number of '00' indicates that the ecological community occurs on a site unit that is not part of the MOF site series classification but is recognized from other vegetation and site classifications, and ecosystem mapping projects.

[Change Criteria](#) | [New Search](#) | [Results](#)

Schedule "C" continued

2. Report
 - b. *Mount Benson Regional Park- Review of Nature Values- Forestry*

Mount Benson Regional Park – Review of Nature Values - Forestry

*A rapid field assessment of Mount
Benson Regional Park*

November 2009

Econ Consulting
Len Apedaile, R.P.F.
PO Box 329
Merville, BC, V0R 2M0
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Mount Benson Regional Park – Review of Natural Values – Forestry

A rapid field assessment of the Mount Benson Regional Park area was conducted on June 19, 2009 by Len Apedaile RPF, Econ Consulting accompanied by Leigh Sifton and Harriet Rueggeberg of HB Lanarc Consulting. The purpose of the assessment was to gain an overview of existing forest resources and rehabilitation needs for inclusion in the park management plan. The primary emphasis was on recently logged areas with secondary emphasis on the existing forest cover.

Methods:

The rapid assessment was conducted on foot over a period of 6 hours and involved hiking up the Witchcraft Trail (#1), from the end of Benson View Road, through the VISU Woodlot # 20, until the old logging road. From there the assessment proceeded east along the central logging road network and visited the majority of the areas harvested in 2003 and 2004 from west to east and from lowest elevation to highest. Portions of each of these polygons were walked to ascertain the general status of natural regeneration, plantability, slash loading, and other vegetation. The condition of existing roads and drainage structures were also observed as well as the apparent status of logging trails, landings and other disturbed areas to identify any issues or rehabilitation needs.

After hiking through the harvested areas the assessment continued up the Te'tuxw'tun Trail through older second growth and old growth forest polygons to the summit. We then descended back to Benson View Road via Scramble Trail and Rafe's Way, through the westernmost harvested areas and Witchcraft Trail (#2).

Following the assessment a meeting was held with Paul Chapman and Gail Adrienne of the Nanaimo Area and Land Trust (NALT) to provide further background on the property and to discuss the preparation of a more detailed reforestation plan and recommended methods of reforestation in association with NALT's Habitat Restoration and Enhancement Crew Project.

The digital orthophoto and base map layers, (including property boundaries, forest cover polygons, roads and trails), were then used to conduct a more detailed overview assessment and net calculation of harvested areas and disturbed / non-productive areas (trails, roads, landings, rock outcrops). This data will form the basis for the reforestation plans. A telephone conversation was also held with Joe Materi of Ursus Environmental to review and discuss general observations, rehabilitation approaches and species selection for reforestation and rehabilitation of disturbed and degraded areas.

Observations:

Harvested Areas

- **Area Summary**

For reference purposes, the harvested areas are subdivided into 5 areas as shown on the attached map and in the following table:

Unit	Gross Area (ha)	Road/Trail Area (ha)	Net Area (ha)
1	1.0	0.0	1.0
2	12.0	0.6	11.4
3	4.4	0.3	4.1
4	4.8	0.1	4.7
5	6.7	0.1	6.6
total	28.9	1.1	27.8

The extent of the harvested areas, roads and logging trails were digitised to delineate and estimate the gross and net areas. Residual patches of timber within the harvested area were excluded. Non-productive road and trail areas within these polygons were estimated based on 5m average width for roads and 3m average width for trails. These areas were deducted from the gross areas to arrive at an estimated net productive land area for reforestation. Further deductions for non-productive rock outcrop areas have not been included but are assumed to account for less than 5% of the net area.

As a result, the estimated total area requiring reforestation is approximately 28ha.¹

- **Current Status**

- Site ecology and general productivity

The general ecology of the Park and the applicable biogeoclimatic zonation is described in the Assessment of Conservation Values within Mt. Benson Regional Park (2006). The harvested areas occur within the transition between two variants of the Coastal Western Hemlock (CWH) biogeoclimatic zone. These are the very dry maritime coastal variant

¹ This is less than the estimate of 64 hectares (51.2ha logged in 2003 + 13.0ha logged in 2004) quoted in the September 2003 and May 2005 Timber Appraisal reports. It is assumed that these estimates broadly estimated the overall extent of the area subjected to logging development whereas the current numbers are based on actual area disturbed and requiring reforestation and excludes areas that were partially or selectively logged and have remaining forest cover.

(CWHxm2) which occurs below 700m elevation, and the montane moist maritime variant (CWHmm2).

The observed site series, which describe the general soil moisture and nutrient regime, were pre-dominantly zonal - 01 (semi dry – poor to medium sites) and expressions of the drier 03 (moderately dry – poor) site series. The predominant 01 sites are indicated by shallow to moderately deep soils and well established vegetation normally dominated by fireweed. The 03 sites occur on steeper areas with shallow soils, usually in the vicinity of rock outcrops and indicated by sparser vegetation cover usually dominated by salal.

The aspect of the harvested areas ranges from N in the western reaches (Unit1) to NE in the lower and eastern reaches (Unit 3 & 5). This northerly aspect tends to moderate the moisture regime of the site and create truly transitional conditions between the two zones.

These characteristics are described because they have a bearing on species selection and reforestation.

The following table summarises the elevation range, biogeoclimatic zone and predominant site series observed during the field review.

Unit	Elevation Range	Biogeoclimatic Zone	General Site Series
1	700-760m	CWHmm2	01
2	680-720m	CWHxm2 – CWHmm2	01 (03) (06t)
3	520-640m	CWHxm2	01 (03)
4	720-820m	CWHmm2	01 (03)
5	620-760m	CWHxm2 – CWHmm2	01, 03

o Stocking and Species

The walk through of a sample of the disturbed areas has indicated that the disturbed areas remain NSR (not sufficiently restocked) 5 -6 years after logging.

Despite this prognosis, there does exist varying amounts of naturally regenerated and established but sparsely distributed tree species throughout the harvested areas. These include: red alder (Dr), red cedar (Cw), douglas fir (Fd), western hemlock (Hw), shore pine (Pl) and western white pine (Pw).

With the exception of some localised concentrations of red alder, it is estimated that current stocking levels vary between 100 -200 stems per hectare (sph) overall.

Varying amounts of germinants were also noted along roadsides and disturbed soils. Most of these are unlikely to survive dry summer conditions. Recent dry summers since logging have likely contributed to lower survival rates of germinants and natural restocking.

The current stocking is in contrast to the adjacent densely overstocked 51 year old stands that were the focus of the harvesting in 2003 and 2004. These stands were naturally regenerated following fire and are heavily stocked.

○ Other Vegetation

The disturbed areas are also covered to varying degrees of distribution and density with a diversity of other plant species including but not limited to fireweed, bracken fern, huckleberry spp, salal, trailing blackberry and grasses. As indicated above there are also isolated small patches of moderate to densely stocked red alder.

Despite the 5-6 years since logging, the extent of the brush layer, with very few localised exceptions, is not expected to pose a significant risk to the further establishment of tree species on the sites by planting (if larger two year old quality stock are used). It will however likely continue to limit natural regeneration through light and moisture competition and seedbed limitations.

○ Slash Loading and Plantability

Due to the high density and age of the harvested stands, it is evident that moderate to heavy slash accumulations remained in many parts of the area. Roadside accumulations have been piled and burned consequently roadsides and landings are quite clean. Low to moderate accumulations consisting of tops, branches and understory material remain scattered throughout the harvested areas. The remaining slash has begun to settle due to the age of material and does not present a significant impediment to reforestation.

With the exception of areas of exceptionally shallow soils around rock outcrops, much of the site appears to exhibit readily plantable, shallow to moderately deep soils. This was not shovel tested and a further plantability survey is recommended.

To summarise, the site conditions are representative of an average coastal second growth logged site and is readily plantable. Moderate effort will be

required in areas with steep slopes, localised slash accumulations and well established vegetation cover.

○ Fire Hazard

A fire hazard assessment was recently conducted on the site by Ministry of Forests staff. While the disposal by roadside slash by piling and burning has abated the fire hazard somewhat, the regular public access along roads and hiking trails combined with dry vegetation in the late summer and moderate in block slash accumulations indicate that until the harvested areas are further regenerated that a degree of fire hazard will remain.

● **Reforestation Options**

○ Reforestation / Rehabilitation Objectives

The reforestation and rehabilitation of the harvested areas within the Park is an inherent goal of the Regional Park Plan. This general objective includes restoration and maintenance of a natural range of forest cover attributes (including tree species and plant communities, age class, density, stand structure and habitat values).

A reforestation plan to achieve this objective should be guided by the following specific objectives and considerations:

- objectives for future forest cover (species composition, function*)
- timeframe to achieve desired state & functional characteristics.
- cost of reforestation and stand management
- priority areas (ie trail corridors, visible areas)

*functional objectives include ecological function and amenity functions such as visual quality and recreation.

Discussion with HB Lanarc staff, NALT staff and with Ursus Environmental suggested that:

- Reforestation should aim to achieve more open and irregular stands (lower stocking) within the harvested areas to enhance forest cover and habitat diversity within the Park. This would be in contrast to the dense second growth stands surrounding the harvested areas. This would include open areas dominated by native brush species that would be subject to slower and more gradual natural reforestation processes.
- Reforestation should strive to include the full diversity of naturally occurring and ecologically appropriate conifer and deciduous species. Reforestation should not be delayed any longer.
- Long term objectives are to achieve a stable, mature seral stage with a diversity of structural attributes and natural successional processes occurring across the range of site / forest cover types.

- Resources are expected to be limited implying that long term objectives will need to be achieved with a minimum of investment in forest stand management interventions beyond initial reforestation to establish the make up and stocking pattern of the future stands.
- Initial priorities should focus on corridors along existing recreation trails to accelerate the visual recovery of adjacent harvested areas. Priorities should also be given to revegetating, restoring and stabilizing soils and areas most heavily impacted by logging activities. These include roadside landing areas and areas of exposed/compacted soil along extraction trails.

With these in mind, three general reforestation options (or strategies) were discussed during the field review. Other than the cost of planting all three assume that due to funding limitations few or no resources will be available for brushing treatments or other stand tending activities. Reforestation therefore becomes the key opportunity with respect to achieving future objectives.

- Option 1: Continue with natural regeneration:
This is a status quo option that will allow the natural process of regeneration to take place over time as existing stocking grows up and new trees seed in and become established. This option will prolong the current brush stage and visual recovery of the site by another 15 – 20 years and result in a more open and variably stocked stands in the medium term and more open partly un-even aged stands in the long term.
- Option 2: Supplemental / partial artificial reforestation:
This option prescribes a mix of planting and natural regeneration with planting taking place in targeted and priority areas such as along hiking trails where quicker greenup may be desired. Other targeted areas would include areas requiring rehabilitation or areas where natural regeneration is expected to be slower due to brush competition or slash loading. This option also allows the areas to be gradually planted in phases according to the availability of funding.

The supplemental nature of this option also implies lower planting densities to take full advantage of establishing natural regeneration.

- Option 3: Aggressive – full artificial reforestation.
This option involves planting conifer species to BC Chief Foresters stocking standards (800-900sph) with the purpose of achieving full stocking of the site and stand establishment as quickly as possible.

This option will create an even aged stand with a specified species composition. Following the CHWmm2 stocking standards provide more flexibility and diversity of conifer species choice while CWHxm2 regimes involve planting predominantly Fd.

Based on the objectives discussed above, Option 2 is recommended as the preferred reforestation strategy, providing maximum flexibility from a timing and cost perspective and for achieving short, medium and long term goals.

↙ This reforestation strategy will be further developed in a separate, detailed ~~silviculture~~ silviculture plan under preparation for NALT. The plan will *annual* incorporate the following considerations with respect to species composition and stocking. →

▪ Species composition

Species options are determined by ecological suitability. A range of conifer and deciduous species are considered ecologically suitable on these sites. Depending on specific site attributes, these include: Fd, Hw, Hm, Cw, Yc, Hm, Pl, Pw, Ba, Dr, (Mb), (Act). Planting a range of species will create an ecologically and structurally diverse forest cover.

The future forest cover will be mainly dominated by coniferous species; however, areas currently dominated by red alder will be allowed to develop into moderately dense alder stands in the interim. Over time, it is anticipated that these alder stands will gradually be replaced by shade tolerant understory Cw, Hw and Ba.

Specific species will also be prescribed for use in areas requiring rehabilitation such as old landings and skid trails. This may also be accompanied with targeted revegetation seeding to help accelerate or improve soil organic matter or reduce erosion potential.

▪ Density (stocking)

Artificial reforestation provides opportunities for density management, including stocking density as well as distribution or uniformity. The surrounding stands as a result of the fire history are excessively dense. While it would be possible to emulate this through higher planting densities, it has been suggested by Joe Materi that managing the disturbed areas to lower densities and more open distribution, including the retention of areas of brush species with little or no stocking, would create an ecologically and

structurally diverse area within the park that would contribute to overall ecological restoration.

- **Roads, trails and landings status**

Roads and 'permanent' trail lengths were estimated from the orthophoto.

<u>Road Name</u>	<u>Total Length (m)</u>	<u>Road Name</u>	<u>Total Length (m)</u>
Rd 1	1581	Tr 1	51
Rd 2	362	Tr 21	176
Rd 3	1055	Tr 22	77
Rd 4	803	Tr 31	257
Rd 5	689	Tr 32	101
Rd 6	903	Tr 5	281
Total (roads + trails)			6336

The density of roads and temporary trails within harvested areas is relatively high in comparison to the area logged, and is a consequence of the harvesting system and long narrow configuration of many of the cut areas. Many of the temporary machine trails within the harvested areas have caused some degree of soil disturbance and degradation that will persist through the next rotation. However, these areas will restock over time and gradually disappear as the canopy closes.

The rapid field assessment looked at general road and harvest trail conditions and for any specific problems that were evident. Generally, the main roads are in good condition with most of the road system located on relatively flat grades on natural benches. The road system in general is considered to be stable and requiring no special management.

The exception is a section of *Road # 3* located in a climbing section between *Unit 3* (at the entrance to the harvesting complex) and *Unit 2*. This steep section (~300m @ est 12-18%) was constructed within a narrow, confined, natural draw that contains a seasonal stream. During periods of high runoff (fall/winter rains and spring snowmelt), water runs down sections of the road surface and established ditch and is resulting in erosion and degradation of parts of the road surface and deepening/widening of parts of the ditch.

The ditch and a culvert at the bottom of this section have been completely blocked by sediment deposition and consequently the ditch water is diverted onto the road and flows along a heavily eroded surface for 20-30m before cascading over the lower side of the road bank, into the cutover. The repair of this particular problem is a drainage management priority. If not repaired, it will eventually wash out the road below the blocked culvert and block access into the rest of the road system. It is estimated that the problem could be relatively easily managed and corrected in about 1-2 day's work with an excavator and should involve:

- walking a machine up from the entrance of unit 3

- removing the blocked culvert and installing a well armoured cross ditch to move the water across the road while continuing to allow light vehicle access,
- armouring sections of the ditch along the length of the section above the culvert to prevent further erosion and ensure that the water is properly channelled. Managing water velocity through the installation of ditch blocks or weirs is also recommended but it should be noted that these will require periodic maintenance to manage sedimentation build up such that the ditch does not fill up and spill water back onto the road surface.

After, the water eventually returns to the natural downstream portion of the same stream which runs through the length of Unit 3 . Sections of the streambed within Unit 3 have also been disturbed by logging access trail construction resulting in bank destabilisation, active erosion and ongoing sediment transport. Natural revegetation is occurring in these areas and it is expected that this will eventually naturally stabilise. Some remedial work by hand may be considered should resources permit; however, further assessment is required. Machine remediation is not recommended.

- Landing and access trail rehabilitation options (grass seeding / planting)
Several landings have been partially rehabilitated through decompaction and distribution of large woody debris. There are also several areas along roadsides and at trail junctions where there has been significant soil disturbance. In both cases these areas of disturbed soil, despite the landing treatment , have yet to see any revegetation. These areas should be considered for remedial revegetation with a mix of grass and legume species as well as planted with tolerant conifers including Cw and Pl. It is suggested that a quick growing revegetation treatment such as fall rye be applied to create a quick green up and then a resulting mat of straw that will foster soil development processes and the establishment of native grasses and legumes that could be over seeded into the rye straw. Because the rye is not persistent (does not seed) it presents little danger of environmental contamination.

Existing Forest Cover

General Management Considerations

The rapid assessment did not identify any specific management issues associated with the existing forest cover stands other than ongoing fire protection and safety.

The existing forest cover that dominates the majority of the Park area is described in the Timber Appraisal (DRFS 2003) and is categorised into types. These include recently logged areas, the 50 year old fire origin stands, remnant pockets of old growth forest and open forest areas associated with the dry rocky outcrops.

The old growth areas provide some spectacular examples of structurally diverse coastal forest including large Cw, Fd and Hw trees. The younger dense fire origin stands that make up a majority of the Park, show signs that despite their understory density that a dominant over story is being expressed and will continue to develop and diversify over time re-creating future old growth characteristics in the long term. Evidence of active natural thinning processes were noted in these stands including significant pockets of snow press that had effectively removed the majority of the intermediate layer.

Consequently no specific ongoing management interventions are contemplated to manage and or maintain the existing forest stands.

Considering the nature of the park and park activities , protection activities should focus on user education and fire hazard notification. Response to any fire incidents will likely rely on external agencies. Protection initiatives and contingencies should be considered in the overall management plan.

From a safety perspective ongoing attention to hazard trees and maintenance along hiking trails will be required and may involve the occasional felling of trees that present a danger. Attention should be given to locations (such as viewpoints, water features or interesting forest features) where people tend to stop, congregate or camp.

Summary

The forest resources within Mount Benson Regional Park are generally in good condition. Priority should be given to the reforestation of recently logged areas, the rehabilitation of disturbed soils, and the maintenance and rehabilitation of road and trail sections that are located within natural drainages. A variety of reforestation options exist for harvested areas depending on objectives and available resources.

The management of existing stands should continue to rely on natural stand development processes. Fire protection/education of recreational users and the management of safety hazards along trails and high use areas should continue.

Reference documentation:

A Proposal for the Regional District of Nanaimo. Consultant Services: Management Plan for Mount Benson Regional Park. H.B. Lanarc Consultants Ltd. Jan 2009.

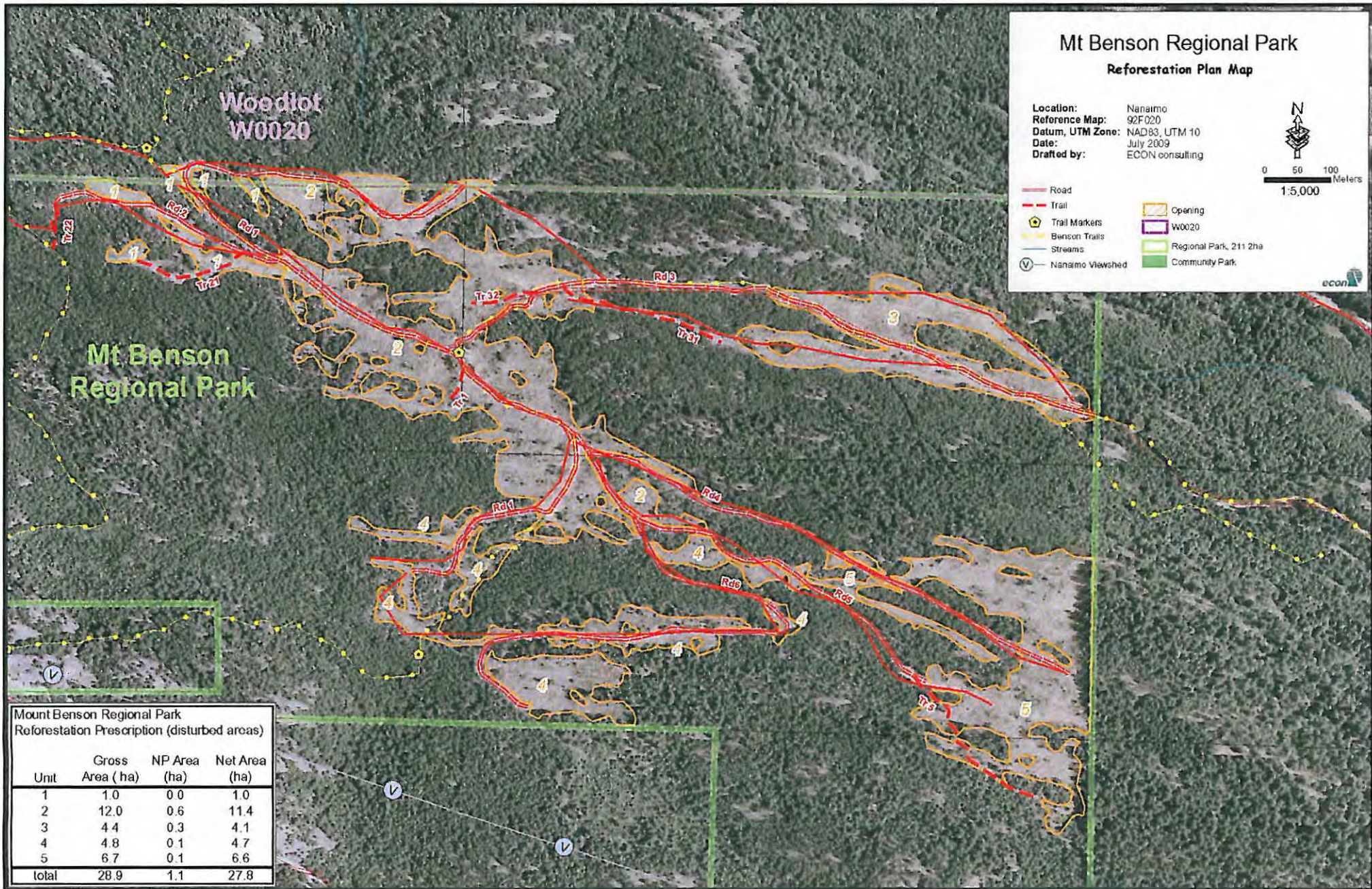
Assessment of Conservation Values within Mount Benson Regional Park, Nanaimo. Joe Materi, Ursus Environmental, September 27, 2006

Timber Appraisal of Mt Benson Properties Section 7, Block 787, and Block 1161 Nanaimo, B.C., David Robinson Forestry Services, September 30, 2003

Revised Timber Appraisal of Mt Benson Properties. Section 7, Block 787, and Block 1161 Nanaimo, B.C. David Robinson Forestry Services, May 7, 2005

JCP Proposal for : NALT Habitat Restoration and Enhancement Crew Project

Mount Benson Regional Park Management Plan, Review of Natural Values – Forestry, June 19, 2009



Schedule "C" continued

2. Report
- c. Chapter 3 of *Mount Benson Regional Park 2010-2020 Management Plan*

3.0 DEFINING THE PARK VALUES

3.1 LAND STATUS

The 212 hectares (523 acres) that comprise Mount Benson Regional Park occupy the upper north face of Mount Benson, lying between the 457 m (1,500 foot) and 1,006 m (3,300 foot) elevations. The Park is made up of three separate parcels legally described as Block 787, Block 1161 and Section 7, Range 4 within the Mountain Land District. The Park does not include the twin summits of the mountain (Figure 2).

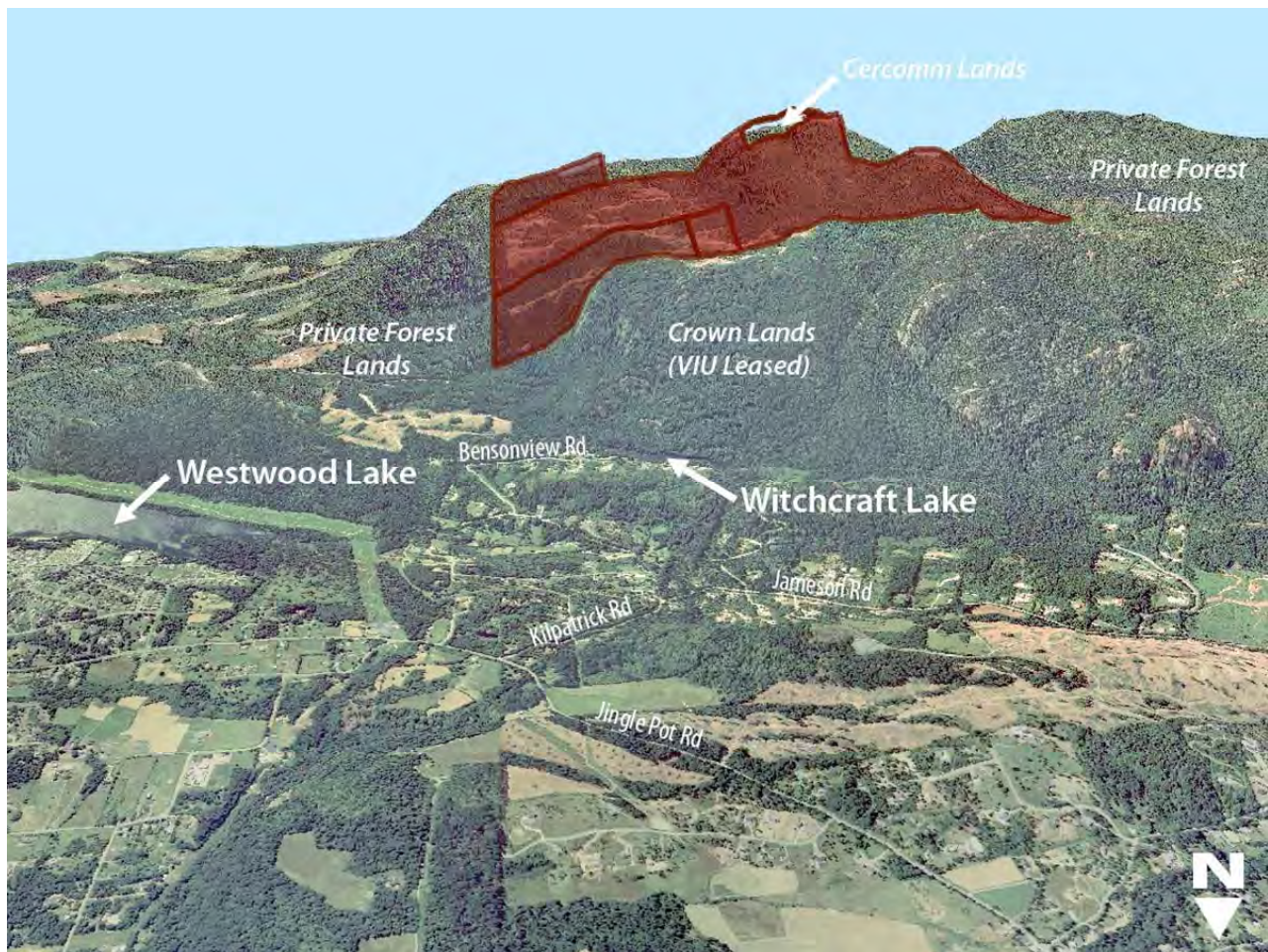


Figure 2: Mount Benson Regional Park (red) and surrounding lands

3.1.1 Neighbouring Lands

The Park is surrounded by private managed forest owned by Island Timberlands Ltd and TimberWest Forest Corp. to the east, west and south; and by BC Crown land to the north tenured to Vancouver Island University under Woodlot License #W0020 (Figure 3).

The mountain has two summits neither of which are contained in the Park. The west summit is a small (1.24ha/ 3.06 acre) parcel of Provincial Crown land which originally housed a fire tower. The east summit is encompassed in a 4.8 hectare (12 acre) parcel owned

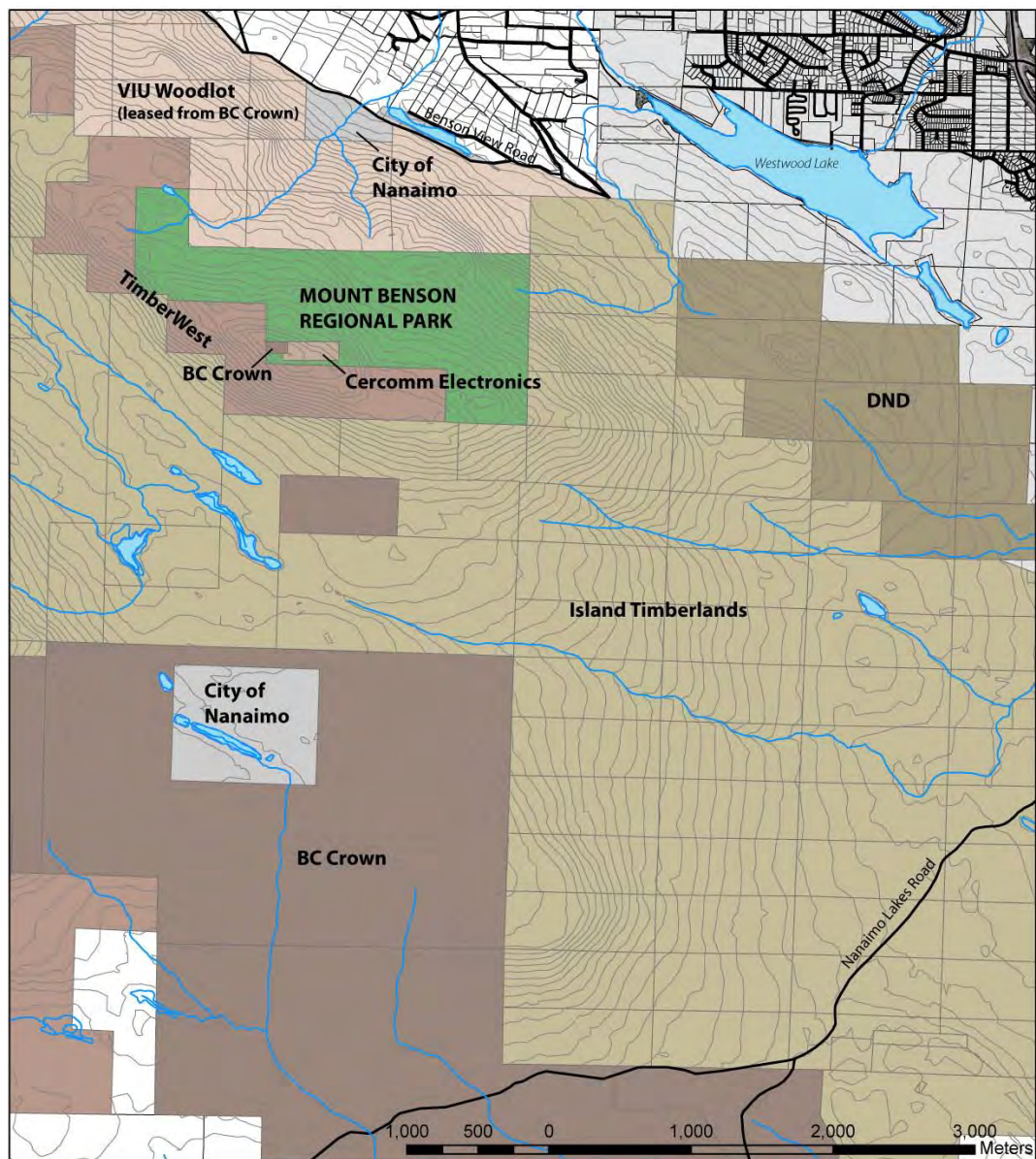


Figure 3: Mount Benson Regional Park and neighbouring properties

by Cercomm Electronics Ltd., which operates several transmission antennas and a diesel generation facility on site.

The City of Nanaimo holds park lands at Westwood Lake and Witchcraft Lake, both popular points of access to the mountain.

3.1.2 Leases and Encumbrances

Cercomm Electronics holds an *easement* over the Park lands that grants Cercomm the right to construct, install and maintain an access road and poles, wires, conduit and other apparatus for the supply of electrical power. In doing so, Cercomm is obliged to use reasonable efforts to minimize the footprint of such construction within the Park. Once permanent elements are constructed, the easement will be modified to include only the built areas.

A *Contribution Agreement* between the RDN and NALT was signed in 2005. Through this agreement, NALT and the RDN each contributed 50% of the property cost and committed to work together in the preparation of the Park Management Plan and to ensure a significant role for NALT and/or the Mount Benson Legacy Group in park stewardship and future management including trail development and restoration of logged areas.

A *Conservation Covenant* will be placed over the lands once this Management Plan is approved and adopted. The terms of the covenant will reflect the RDN's Regional Park goals and policies and the specific management directions defined through this management plan, while protecting NALT's interests in future stewardship of the Park. NALT will take the lead role as one of two Land Trust organizations holding the covenant and will be responsible for annual monitoring.

3.1.3 Land Use Regulations

Mount Benson Regional Park lies within Electoral Area 'C' and is designated in the *Arrowsmith Benson-Cranberry Bright Official Community Plan* (OCP) as Resource lands. The resource land designation applies to lands used for forestry, resource extraction, agricultural production or environmental conservation. The objectives of this designation include supporting and maintaining the long-term viability of the natural resource value and to protect it from activities and land uses which may diminish its resource value or potential (RDN Bylaw No. 1148). Within this land

designation, outdoor recreation and ancillary facilities exclusively devoted to outdoor recreation are listed as permitted uses.

Objectives of the OCP relevant to Mount Benson Regional Park include:

- To preserve, protect and enhance the area's natural resources which include not only aquatic and terrestrial wildlife and plants, but also freshwater, agricultural, forest, and mineral resources;
- To preserve and protect environmentally sensitive ecosystems and the nesting trees of protected species.

The *RDN Regional Parks and Trails Plan 2005-2015* sets out the future direction, policies, priorities and actions for regional parks and trails. The vision outlined in this plan is for a system that protects and stewards natural values while providing rewarding recreational opportunities; fostering education and appreciation of the natural environment; and, enhancing the livability of the Region.

RDN Park Use Regulations Bylaw No. 1399 (2004) regulates park use in community and regional parks. This bylaw limits park use to non-motorized activities (walking, cycling and horseback riding). Mount Benson Regional Park is listed as a Level 4 Park – “Undeveloped Park, Trail and other Open Space.” Park Use Permits are issued under this bylaw for such activities as commercial recreation services, special events and research activity.

3.1.4 Utility and Road Services

There are no utilities to the Park. The closest hydro and telephone service is about 6.4 km away on the private logging road system to the east of the Park. Cercomm Electronics currently powers their antennas at the east summit using on-site diesel generators. As noted, Cercomm may construct a power line to their facility over Park land. However, as this Management Plan was being developed, Cercomm was assessing whether their power needs could be met by using small on-site windmills.

There are no public roads to the Park. Two private logging road networks lead from Nanaimo Lakes Road to the east and south boundaries of the Park. Portions of these roads are maintained by the respective forest companies depending on logging activity.

They are not publicly accessible and are gated and locked near their entrances. Access to the Park along these roads can be obtained for maintenance and emergency purposes.

The Island Timberlands road to the east boundary was extended by the previous owner into the property to facilitate the 2003-2004 logging. However, the roads within the Park have since been decommissioned and are very rough, accessible only by a 4x4 vehicle with good clearance.

The logging road accesses from Nanaimo Lakes Road were not included as a choice for how people access the Park in the survey. However, numerous people commented that this was the route they use to access the slopes of Mount Benson and the Park. Long time residents remember when their families could drive to the summit via the old fire tower road (1950-60s).

The private forestry companies have indicated that they are not interested in permitting public access on their roads from Nanaimo Lakes Road at this time, due to concerns of increased dumping, vandalism and fire arson. They did indicate that they would continue to allow emergency and servicing access to the Park boundary by authorized personnel.

3.1.5 Fire and Emergency Service

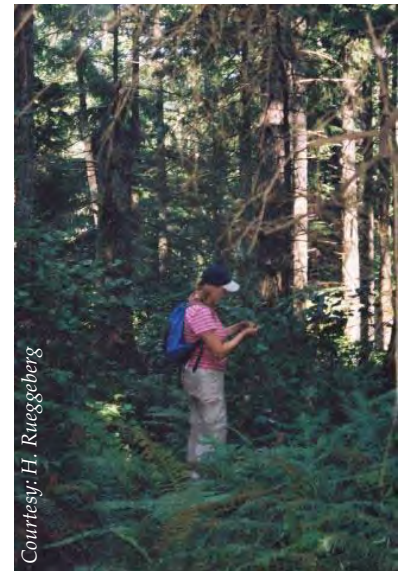
The RDN has a cost-sharing agreement with the Province's Coastal Fire Centre for fire response in the Park. The Coastal Fire Centre, located in Parksville, is the fire dispatch and operational centre for wild land fire fighting in South Coastal BC and supports 12 fire bases throughout the region. The Mid-Island Fire Zone provides service for the Park. Costs for this service are generally based on risk and fire-start potential.

Other emergency services are provided by the RCMP and by Nanaimo Search and Rescue, a registered non-profit society.

3.2 NATURAL RESOURCES

3.2.1 Environmental Features and Systems

In 2006, Ursus Environmental prepared an *Assessment of Conservation Values within Mount Benson Regional Park* for NALT. This project consolidated existing environmental and resource data



Typical 2nd growth forest in Park

related to the Park property, conducted a ground verification of sensitive ecosystems identified by previous inventories, and assessed the site's overall conservation values using standardized methods. This section is based in large part on this Assessment and further verification by Ursus Environmental.

Biogeoclimatic Zones

Mount Benson Regional Park encompasses two variants of the Coastal Western Hemlock (CWH) biogeoclimatic zone, including the Very Dry Maritime Coastal Variant (CWHHxm2) below 700m elevation and the Montane Moist Maritime Variant (CWHmm2) from 700m elevation to the summit. Differences between these two variants are related to elevation differences, with cooler temperatures and more snowpack in the higher reaches of the mountain. According to Pojar (1991), the CWH zone has the greatest diversity and abundance of habitat elements of all biogeoclimatic zones in the province.



Wetland at northwest end of Park

Hydrology

The summit of Mount Benson is the highest point of the Millstone River watershed and is the source of McGarrigle, McNeil and Benson Creeks that flow down its north slopes to Witchcraft Lake, Westwood Lake and the Millstone River. The east slope drains into the Chase River system. Mount Benson Regional Park forms the headwaters for these watercourses.

Wildlife Corridors

These aquatic systems form the basis for a network of wildlife corridors on the mountain and its surrounding areas. Several large species are known to use or travel through the region, including cougars, black bears and Columbian black tailed deer. In addition, a variety of small mammals and avifauna have been recorded in or near the study area (Ursus Environmental, 2006).

Sensitive Ecosystems

The *Sensitive Ecosystems Inventory for Southeastern Vancouver Island* (the SEI), published by federal and provincial environmental agencies in 1997, identified a variety of sensitive ecosystems on Mount Benson from aerial photography analysis. Fourteen SEI polygons were identified in the lands now comprising the Park.

Some of these polygons were subsequently field evaluated and updated by students from VIU in 2003-2004.

Ursus Environmental's assessment in 2006 confirmed the presence of eight of the SEI polygons, two of which had revised ecosystem associations. Four other SEI polygons were found to be significantly degraded by logging activity and two others remained unconfirmed due to accessibility constraints. Ursus also identified 9 new sites that meet SEI criteria. Figure 4 shows the location of known SEI polygons in and around the Park; there are likely more SEI sites that have not yet been identified.

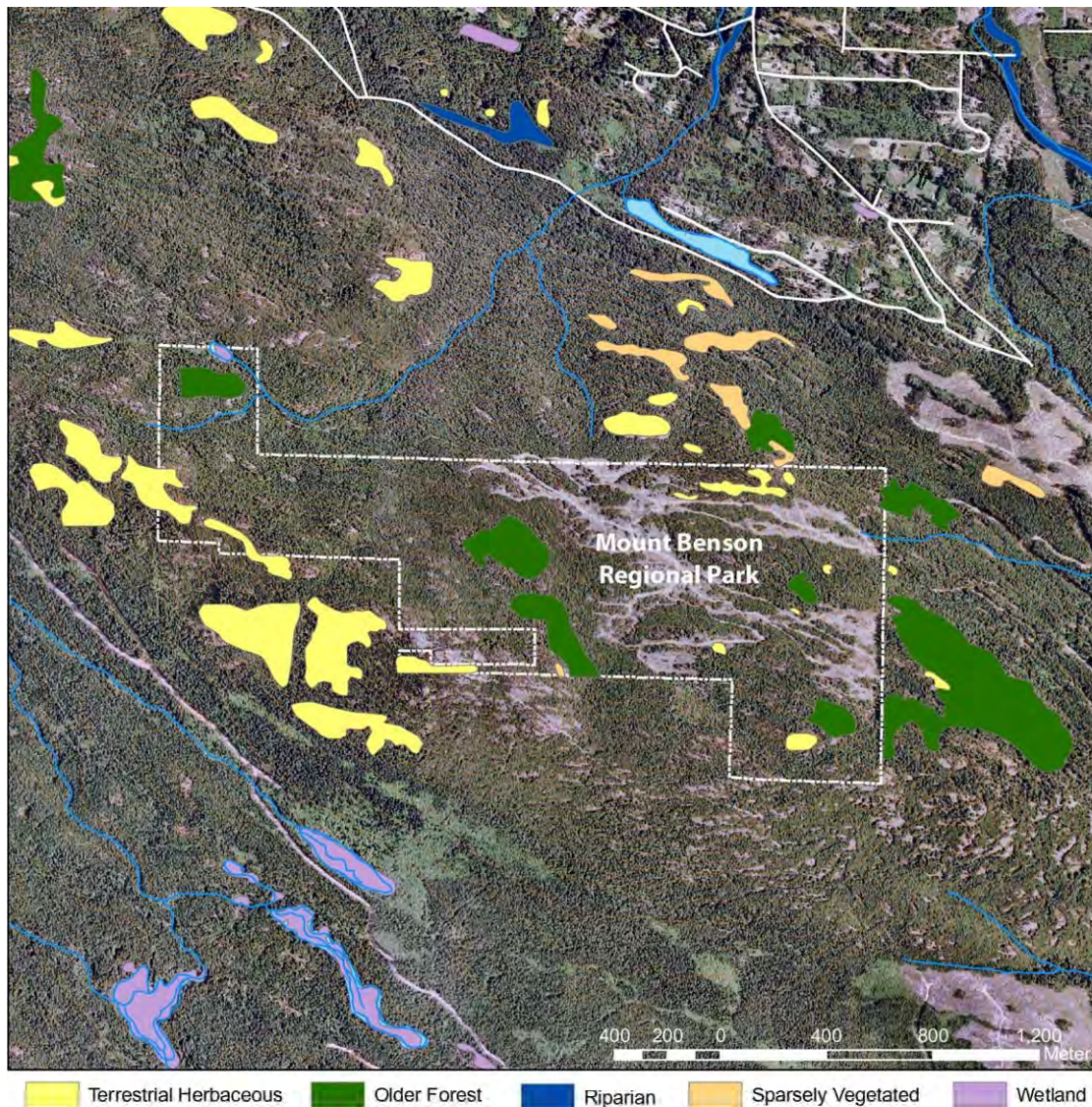


Figure 4: Sensitive Ecosystem polygons identified in the Park (from Ursus Environmental, 2006)

Other Ecological Features

Ursus Environmental's 2006 assessment highlighted the following additional ecological features:

Fungi – No formal inventory has been conducted although casual observations over nearly two decades indicate a rich fungi assemblage within the Park.

Avifauna – More than 75 bird species have been recorded in or near the Park. 52 of these are known to breed locally while the remainder likely over-winter in the area. Two identified species-at-risk are known to breed locally including the Northern Goshawk (red-listed) and the Western Screech-owl (blue-listed).

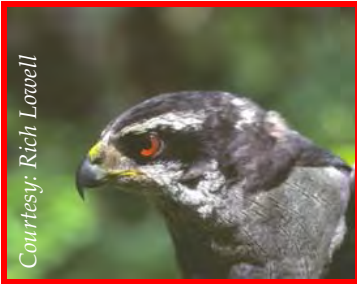
Mammals – Columbian black-tailed deer are common in the region. Evidence of cougar, elk and black bear has been found in the Park. In addition, scat belonging to marten, a highly arboreal member of the weasel family, has been seen in the Park.

Amphibians and Reptiles – Three species of native amphibians have been documented within the Park, including the northwestern salamander, western toads and pacific tree frogs. No reptile observations have been noted from previous field sessions. However, the Park falls within the distributional range of four species of native reptiles including common and western terrestrial garter snake, northwestern garter snake and the northern alligator lizard.

Conservation Assessment

A widely recognized approach to assessing conservation value is to identify Valued Ecosystem Components (VECs) and rate the site's importance to them. VECs are defined as "any part of the environment that is considered important by the proponent, public, scientists and government involved in the assessment process. Importance may be determined on the basis of cultural values or scientific concern" (Canadian Environmental Assessment Agency). Typical VECs include species diversity, presence of rare/endangered species or communities, and habitat connectivity (the ability of species to range through natural habitats without barriers or breaks).

Based on information available, Ursus Environmental identified and rated nine VECs occurring in the Park (Table 1). The overall



Courtesy: Rich Lovell
Red-listed Northern Goshawk.



Courtesy: US Forest
Blue-listed Western Screech Owl



Courtesy: Rod Gilbert
Blue-listed Macoun's groundsel

Rare or threatened species found in or known to use Mount Benson Regional Park.

conservation value of the Park is high, with individual VECs rated as moderate to high.

Table 1: Valued Ecosystem Components identified in the Park (Ursus Environmental, 2006)

Valued Ecosystem Component	Regional Importance Rating	Rating Rationale
1. Vascular plant diversity	High	117 species recorded to date
2. Rare/ uncommon plants	Moderate-high	2 Blue-listed species (current,/historical); 2 locally uncommon species
3. Fungal diversity	High	> 30 species recorded, many depend on stable older forest habitat
4. Rare/uncommon fungi	Moderate	1 species considered rare
5. Vertebrate diversity	High	At least 75 bird, 6 mammal, 3 amphibian species
6. Rare/uncommon vertebrates	Moderate-high	1 red-listed, 1 blue-listed, 6 locally rare bird species; potentially 1 federally-designated at-risk amphibian.
7. Ecosystem representation	Moderate	Spans 2 biogeoclimatic variants, contains unusual 'transition zone' features; 2 blue-listed forest ecosystems.
8. Sensitive ecosystem presence	High	16 ground-checked SEI polygons
9. Habitat connectivity	High	Provides elevation and wetland-to-upland corridors for wildlife
Overall Conservation Value	High	

3.2.2 Forestry

As stated earlier, past logging activities and major fires have shaped the forested slopes on Mount Benson. In 2003 and 2004, logging was conducted by the previous owner on the east portion of the Park.

In support of acquisition negotiations, a Timber Appraisal was conducted in September 2003 and updated in May 2005 following logging activity. Five significant forest cover types were identified in the Appraisal, including:

- *FH 320* – A 45-year old stand with Douglas fir and western hemlock as dominant species accounts for approximately 76 hectares (188 acres) of the Park area. The majority of the 2003 - 2004 logging was concentrated within this type.
- *FPI 320* – This 14.1 hectare (35 acre) stand contains a predominant mix of Douglas fir and lodgepole pine, growing on very shallow soils over bedrock.
- *HF (CyCw) 921* – Covering approximately 22 hectares (54 acres) of the property, this type consists of old-growth mix of over-mature western hemlock, Douglas fir, yellow cedar and western red cedar growing over shallow soils on bedrock. Due to limited availability of nutrients and moisture, trees in this type tend to show signs of decay or defect.
- *Non-Productive* – This type includes non-merchantable rocky areas, old roads and trails as well as inoperable bluffs. This area accounts for approximately 39 hectares (96 acres) of the property.
- *2003 and 2004 Logged Areas* – Impacted some 64 hectares (158 acres) of the east portion of the Park.



Natural revegetation of disturbed area

A 'rapid field assessment' of forestry values was conducted in August 2009 by Econ Consulting as part of this Plan. The full report is contained in Addendum 1. Main findings from this assessment include the following:

- Of the 64 hectares affected by recent logging, approximately 28 ha (69 acres) requires reforestation with the remainder being residual patches of standing timber, roads and trails, and rock outcrops.
- Varying amounts of naturally regenerated tree species (e.g., red alder, red cedar, Douglas fir, western hemlock, shore pine and western white pine) occur over the disturbed areas, but in general, these disturbed areas remain "not sufficiently restocked" (NSR) 5-6 years after logging.

- The disturbed areas are also covered to varying degrees with a diversity of other plant species typical of rapid revegetation, including fireweed, bracken fern, huckleberry, salal, grasses, etc. However, this brush layer should not pose a significant risk to further establishment of tree species by planting, but will likely continue to limit natural regeneration through light and moisture competition and seedbed limitations.
- With the exception of areas of exceptionally shallow soils around rock outcrops, much of the disturbed areas are readily plantable, though this needs more detailed analysis. Moderate planting effort will be required in areas of steep slopes, localized slash accumulations and well-established vegetation cover.
- The major slashpiles were burned in 2008. However, public access along roads and hiking trails combined with dry vegetation and remaining slash cover indicate that a fire hazard remains in mid- to late summer.
- Most of the logging roads in the disturbed areas are considered stable and require no special management. The exception is one steep section of Road #3, about 150 m below (east of) the intersection of Roads 1, 3 and 4 (see Addendum 1 map), which was constructed through a natural drainage bed and which now is subject to active erosion and bed transport.
- Former 'landings' and access trail edges would benefit from quick-growth revegetation, such as fall rye, to waylay erosion, then further rehabilitation with native grasses, legumes and grass tolerant conifers.
- No specific management issues were identified with the existing forested areas in the Park, other than ongoing fire protection and hazardous tree management.

The report presents options for reforestation of the disturbed areas from natural regeneration to full artificial reforestation, recommends a "supplemental reforestation" option, and discusses factors for species selection and restocking density. These points form the basis for policies and actions in the next section of this Plan.

3.2.3 Mineral Claims

In British Columbia, private land ownership does not usually include the rights to minerals or other subsurface resources. In most cases, the mineral rights remain with the Crown.

Under the *Mineral Tenure Act* (RSBC 1996), individuals are able to secure sub-surface mineral claims either through Legacy Claims or Cell Claims. Legacy Claims are ground-stake claims whereas Cell Claims are acquired by map selection through Mineral Titles Online (BC Ministry of Energy, Mines and Petroleum Resources).

Three Legacy Claims (406388, 406389 and 406625) originally covered lands within Mount Benson Regional Park, but expired on October 2004 and January 2005. Three Cell Claims Tenures currently overlap into the Park. Two of these (598484 and 598485) were claimed following designation of the Regional Park and as such, are subject to Section 21 of the Mineral Tenure Act, which states that *“Despite any Act, agreement, free miner certificate or mineral title, a person must not locate a mineral title, carry out exploration and development or produce minerals or placer mineral in a park created under an Act of British Columbia”*. As such, any exploration and development activity by the tenure holder must be conducted outside of the Park boundaries.



Hiking on Mt. Benson

The third Cell Claim Tenure (510914) was claimed prior to the designation of the Park and thus takes precedence and is not subject to Section 21 of the Act. In order to conduct exploration and development activity within the Park, the tenure owner is required to serve notice to the landowner (the RDN) under Section 19 of the Act.

Mineral claims grant exclusive rights to minerals in a defined area and claims must be maintained by paying a fee and by meeting minimum annual exploration and development work requirements outlined in Section 8 of the Act. This work may be non-intrusive (e.g. visual survey; collection of surface rocks) or intrusive (e.g. drilling holes, digging pits). Any work that disturbs the surface requires a permit under the *Mines Act*. Although notice to the landowner is required as per Section 19 of the Mineral Tenure Act, the landowner cannot prohibit entry but is entitled to compensation for loss or damage caused by the entry.

3.3 RECREATION

3.3.1 Local Demographics and Tourism Trends

In 2006, the population of the RDN was 138,631. Almost 57% of that population (78,743) lived in the City of Nanaimo, making it the second largest municipality on Vancouver Island after Victoria. Between 2001-2006, the RDN's population grew by 9.1% (average 1.8%/year).

The average age in the RDN (46.6) is older than the provincial average (40.8). Only Electoral Areas A (13.8%), C (11.1%) and F (11.3) have fewer residents aged 65+ than the BC average (14.6%) (BC Stats Census Profile, 2006).

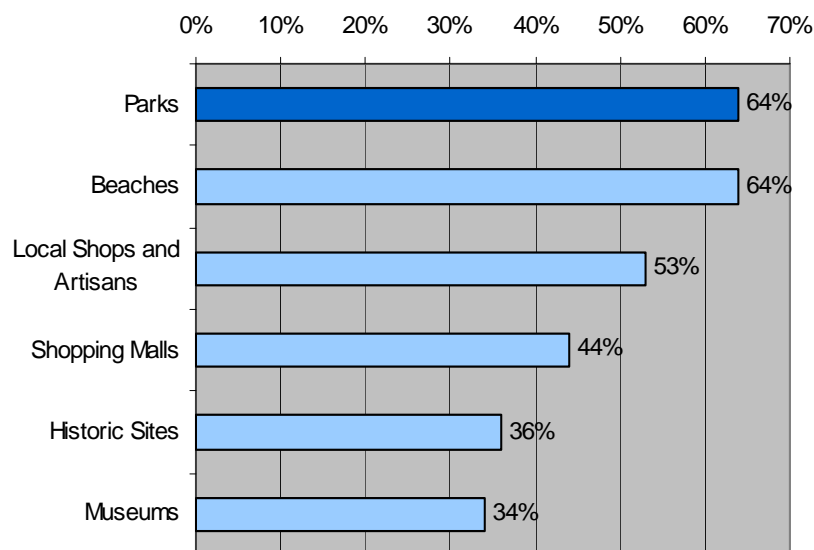


Figure 5: Top tourism attractions in Central Vancouver Island (Tourism VI, 2006)

Visitor profiles for the Central Island Tourism Region indicate that the two most popular activities visitors to Central Vancouver Island report participating in are hiking (50% of respondents) and wildlife viewing (40% of respondents). Other popular activities reported include bird-watching (24%), cycling/mountain biking (14%), and horseback riding (4%) (Tourism Vancouver Island, 2007). The same survey indicates that parks and beaches are the highest ranked attractions (64% each) for people visiting the Central Island (Figure 5). Features considered important in visitor decisions to visit

Central Vancouver Island included scenic beauty and outdoor recreation opportunities.

3.3.2 Relevant Recreation Trends

Individual and Informal Activities – Participation levels in many organized sports have declined in the past decade with an increase in individual activity preferences. The trend shows increased walking, cycling, gardening, cultural activities, outdoor education and ecotourism – which are largely individually-based activities.

According to the Recreational Trails Strategy for British Columbia Background Report (2007), hiking is the number one activity in North America. There has been an increase in demands for other uses, particularly mountain biking, which is one of the fastest growing segments of the outdoor recreation spectrum in BC.

Public Stewardship – As environmental awareness increases, emphasis on parks, natural areas and nature-based recreation takes on additional significance. The desire to learn about the natural environment through outdoor experience is growing and people are becoming increasingly willing to participate in projects to protect or restore sensitive environmental areas. Park programs are beginning to evolve to provide opportunities to help with inventory, restoration and enhancement projects.

Active Communities – The RDN is a participant in the provincial Active Communities initiative that seeks to “promote and support...a way of life in which physical activity is valued and integrated into daily life” (BCRPA, 2005). The goal of this initiative is to work with local governments and partner organizations to undertake actions that promote healthy lifestyles, build healthy communities and increase physical activity levels amongst British Columbians by 20% by the year 2010.

3.3.3 Current Park Use

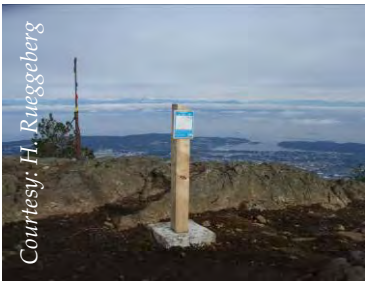
The slopes of Mount Benson have a long tradition of use by area residents and visitors. There are a variety of trails that have been constructed informally over the years, many based on pre-existing logging roads and others built to interconnect between these main trails.

Today, the mountain and its trails are used by a variety of outdoor recreation enthusiasts – including hikers, mountain bikers,



Courtesy: NALT

Informal sign installed by users of Witchcraft Lake trail.



Courtesy: H. Rueggeberg

Trail map installed by NALT/RDN at Mt Benson summit.

horseback riders, ATV'ers, snowmobilers and climbers. There has also been some amount of wilderness camping, both summer and winter, evidenced by the presence of flattened vegetation, fire rings, refuse and human waste.

There are four main points of access: Witchcraft Lake off Benson View Road; Westwood Lake; Nanaimo Lakes Road; and to a lesser extent, the end of Jameson Road. About 58% of park survey respondents indicated they use the Witchcraft Lake access and 56% use the Westwood Lake access, the two most popular trailheads.

There are additional but less well known points of access from logging roads or rights-of-way. These tend to link to one of the trails that start from the main access points.

As noted earlier, all park access trails start on lands outside of the Regional Park boundary and cross either private forestry land or crown land within the VIU Woodlot before entering the Park (Figure 6).

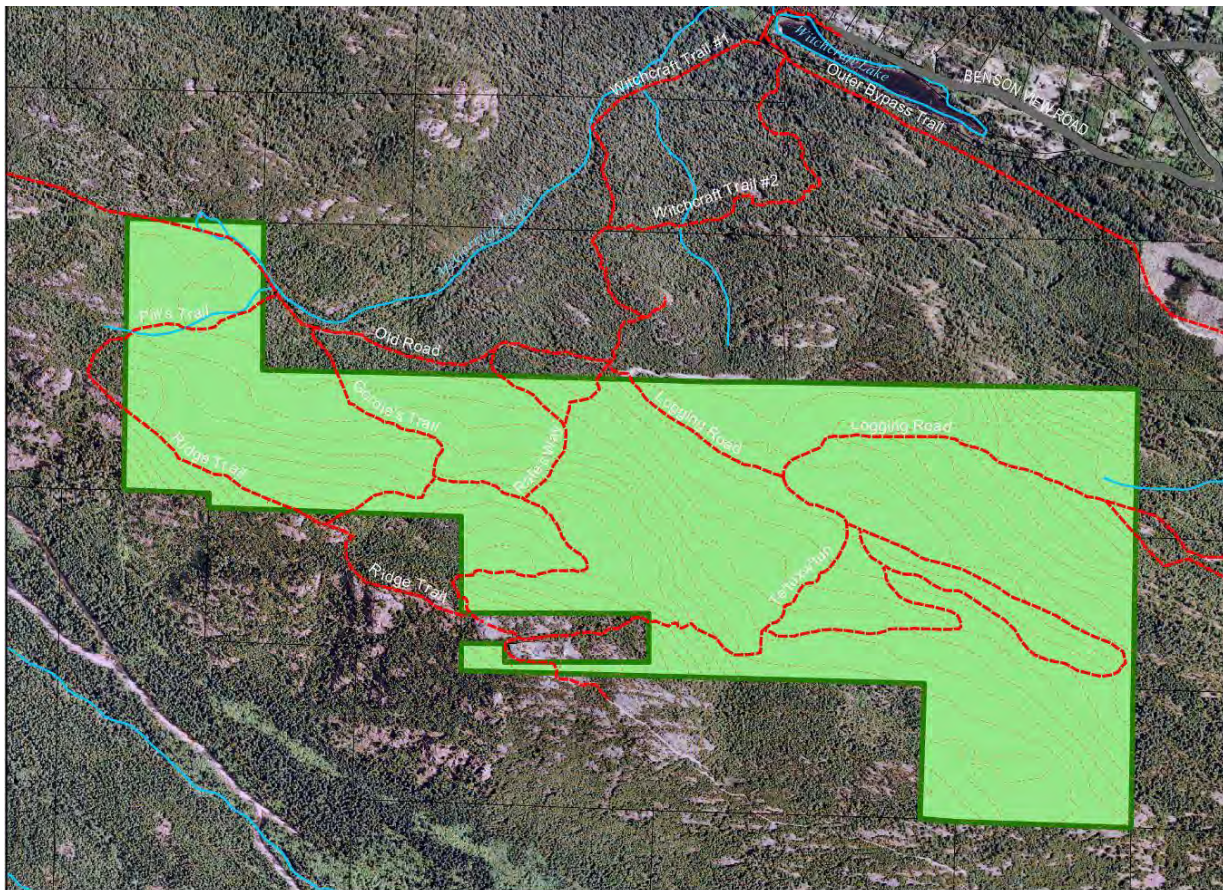


Figure 6: Existing trails in Mount Benson Regional Park

Trails to Mount Benson Regional Park tend to be steep and rugged and some are in relatively degraded condition. Trails within the Park are gradually being improved in partnership with NALT through the Job Creation Partnership (JCP) Program.

There are currently no services (e.g. pit toilets, garbage facilities, rest areas or benches, etc.) provided for park visitors within the Park. The RDN and NALT have erected some directional signs at park boundaries and major trail junctions and several of the major trails have been 'blazed'.

Park users have erected rustic signs and flagging tape along some of the trails leading to the Park boundary, notably the Witchcraft Lake and Westwood Lake trails.

Main Trailheads to Mount Benson Regional Park

Witchcraft Lake trail: originates off the west end of Benson View Rd. on City of Nanaimo property surrounding the Lake. Traverses City and residential properties to VIU Woodlot, and climbs through Woodlot to north boundary of Park. Roadside parking along Benson View Road; on busy days parking can impact area residents, blocking driveways and creating noise.

Westwood Lake: from Westwood Lake Municipal Park, trail crosses Hydro power line, through City of Nanaimo property before ascending through Island Timberlands property over flagged trails and logging roads to the east boundary of the Park.

Nanaimo Lakes Road: via gated and locked private forest service road across Island Timberlands property to the east boundary. A very long route for hikers, but accessible to mountain bikers. ATVs and 4X4s have traditionally accessed by requesting a key or, more often, maneuvering around the gate ends or breaking the lock.

Jameson Road: originates at locked gate at west end of Jameson Rd and traverses through west portion of VIU woodlot to west boundary of park. This route is less well known and used.

3.4 EDUCATION

As noted earlier, summer students from Malaspina University-College's (now VIU) biology department assisted with site inventories in 2003 and 2004, but there are no known regular and ongoing programs using the Park.

NALT, along with the RDN and City of Nanaimo, through their Active Living Guides, occasionally run guided hikes to the summit of Mount Benson.

Historical accounts show that there was an annual ritual for area schools to climb Mount Benson on Easter Break as part of school recreation programs. Currently, although schools may use the lower slopes or lands within the VIU Woodlot for educational programs, because of limited access issues into the Park proper (e.g. steep grades, lack of road), there are no known school programs using the Park site itself.

There is currently no interpretive signage in the Park with the exception of an area map located near the summit.

3.5 HISTORY AND CULTURE

3.5.1 Historical and Archaeological Values

Mount Benson, known as Te'tuxw'tun, is a sacred site of the Snuneymuxw First Nation and was an important area for Snuneymuxw ancestors to hunt and gather food.

The mountain is named after Dr. Alfred Robson Benson, a physician who served with the Hudson's Bay Company from 1857 to 1862 and then with the Vancouver Coal Company.

In 1912, Mount Benson was proposed as a possible site for the new Dominion Astrophysical Observatory by the Meteorological Service of Canada. In the end, a site in Saanich was chosen.

The west summit housed a fire lookout station from 1925 to the mid 1960s. The original wood-frame structure was burned down in 1938 and replaced by a second structure until 1967. The road to the fire lookout station was improved in 1927 which triggered the summit becoming an attraction to local citizens and tourists. Some



Original Fire Lookout

A plane crash in 1951 was the worst aviation accident in BC history at that time. Flight PBY-A5 was travelling from Kemano to Vancouver and may have been blown off course. The plane hit the side of Mount Benson around 490 m elevation and burst into flames, killing all 23 on board. Until recently, plane remnants could be found on the slopes, but by now, most have been removed by 'treasure hunters'.



Remnants from 1951 plane crash.

long-time Nanaimo residents have recounted memories of driving to the summit for family picnics, weddings, family outings and to visit the fire lookout.

There are no known archaeological sites within Mount Benson Regional Park.

3.5.2 Community Identity and Sense of Place

Mount Benson's prominent green slopes set the backdrop for the City of Nanaimo and surrounding area. From tales of hikes in the Times Colonist in 1913, to recent stories of weddings on the summit, to inspiring poetry, Mount Benson means many things to many people, but what is common is the community's connection to the mountain.

NALT's fundraising campaign raised the community profile of the mountain and brought out stories from a variety of people highlighting its importance in the hearts and minds of the people of Nanaimo and area. NALT continues to maintain historical records and photos of the many stories and memories that record Mount Benson's past.

The acquisition and designation of Mount Benson Regional Park in itself is a remarkable story of a community coming together with a common purpose – to ensure a continuing green landmark for the City of Nanaimo.



With donation from Mountain Equipment Coop, NALT reaches fundraising goal