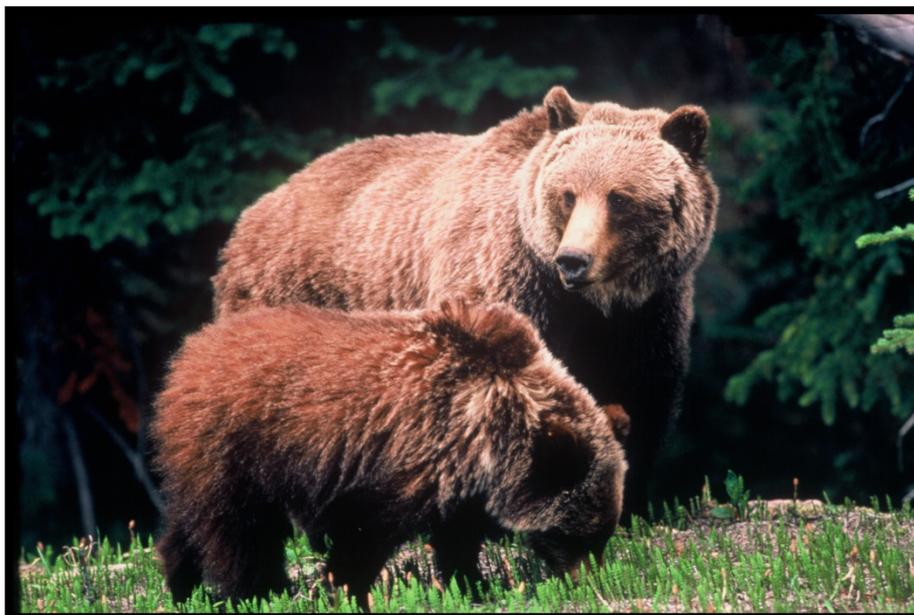


Cranberry

Sustainable Resource Management Plan



June 2012



**BRITISH
COLUMBIA**
The Best Place on Earth

**Ministry of Forests,
Lands and Natural
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Foreword

The purpose of the Cranberry Sustainable Resource Management Plan (SRMP) is to provide long-term sustainability of jobs, communities, and natural resources in the Cranberry Landscape Unit. In keeping with the *Governance Principles for Sustainable Resource Management*¹, the plan provides the following:

- *Certainty*, by providing clear management direction to resource users;
- *Efficiency*, in the allocation, development and use of natural resources, by clarifying the timing and nature of activities that can occur in the area;
- *Flexibility*, by presenting results-based standards that will allow resource users to innovate and employ their professional skills in developing implementation strategies;
- *Transparency*, by creating the plan in a spirit of openness of information and in consultation with First Nations, stakeholders, the general public, and government agencies; and
- *Accountability*, by setting measurable objectives and indicators that can be tracked over time.

The Cranberry SRMP is intended to provide a balance of social, economic and environmental values that meet the interests of all those who have a concern for the area.

It was developed in partnership with the Nisga'a Lisims Government, Gitanyow, and provincial government agencies. The Province of British Columbia has a duty to consult with First Nations, and where required, accommodate First Nations whenever it proposes a decision or activity that could impact treaty rights or aboriginal rights (including title) – either claimed or proven. This duty stems from court decisions and is consistent with the Province's commitment to building a new relationship with First Nations.

Acknowledgements

This plan was completed with the dedicated input from many individuals and organizations. We thank everyone who has contributed their time and knowledge to this document, including: the Nisga'a Nation as represented by the Nisga'a Lisims Government (NLG); the Gitanyow and its representatives; the former Ministry of Forests and Range - Skeena-Stikine Forest District; the Ministry of Environment - Skeena Region; the former Integrated Land Management Bureau, and the Ministry of Forests, Lands and Natural Resource Operations. The following forest licensees were involved in reviewing and providing comments on the draft SRMP: BC Timber Sales - Skeena Business Area; Kitwanga Lumber Co. Ltd.; PacFor Timber Limited, and Gitxsan Forest Enterprises Inc.

¹ *Governance Principles for Sustainability – Application Guidelines*. March 2004, Ministry of Sustainable Resource Management.

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List of Acronyms

AAC	Allowable Annual Cut
AT	Alpine Tundra
BAFA	Boreal Altai Fescue Alpine
BCTS	BC Timber Sales
BEC	Biogeoclimatic Ecosystem Classification
BMPs	Best Management Practices
CDC	Conservation Data Centre
CMA	Coastal Mountain Heather Alpine
CMT	Culturally Modified Tree
CWH	Coastal Western Hemlock
ECA	Equivalent Clearcut Area
EN	Ecosystem Network
ESSF	Engelmann Spruce – Subalpine Fir
FLNRO	Ministry of Forests, Lands and Natural Resource Operations
FREP	Forest and Range Evaluation Program
FRPA	Forests and Range Practices Act
ICH	Interior Cedar Hemlock
ILMB	Integrated Land Management Bureau
JFMC	Joint Fisheries Management Committee
JRC	Joint Resources Council
LRMP	Land and Resource Management Plan
MH	Mountain Hemlock
MOE	Ministry of Environment
NDT	Natural Disturbance Type
NLG	Nisga’a Lisims Government
OGMA	Old Growth Management Area
RMZ	Riparian Management Zone
RRZ	Riparian Reserve Zone
SRMP	Sustainable Resource Management Plan
SRMZ	Special Resource Management Zone
THLB	Timber Harvesting Land Base
TSA	Timber Supply Area
TSR	Timber Supply Review
UWR	Ungulate Winter Range
WHA	Wildlife Habitat Area
WRP	Watershed Restoration Plan

Glossary

Adaptive management	The rigorous combination of management, research, and monitoring so that credible information is gained and management activities can be modified by experience. Adaptive management acknowledges institutional barriers to change and designs means to overcome them.
Allowable Annual Cut	The rate of timber harvest permitted each year from a specified area of land, usually expressed as cubic metres of wood per year. The chief forester sets Allowable Annual Cuts (AACs) for timber supply areas and tree farm licences in accordance with Section 7 and/or Section 170 of the <i>Forest Act</i> . The district manager sets AACs for woodlot licences.
Archaeological sites	Locations containing, or with the potential to contain, the physical remains of past human activity. These sites are assessed through archaeological impact assessments.
Biodiversity	The diversity of plants, animals and other living organisms in all their forms and levels of organization, including the diversity of genes, species and ecosystems, as well as the functional processes that link them.
Biogeoclimatic Ecosystem Classification	A system of ecological classification, based primarily on climate, soils, and vegetation, that divides the province into large geographic areas with broadly homogeneous climate and similar dominant tree species. Zones are further broken down into subzones (based on characteristic plant communities occurring on zonal sites) and variants (based on climatic variation within a subzone).
Blue-listed species	List of ecological communities and indigenous species and subspecies of special concern (formerly vulnerable) in British Columbia.
Coarse filter management	An approach to maintaining biodiversity that involves maintaining a diversity of structures within stands and a diversity of ecosystems across the landscape. The intent is to meet most of the habitat requirements of most of the native species.
Critical habitat	Areas considered being critically important for sustaining a population and where development may cause an unacceptable decline in the population.
Culturally modified tree	A tree which has been intentionally modified by aboriginal peoples as part of their traditional use of forests (Stryd <i>et al.</i> 1998).
Cultural heritage resources	An object, a site or a location of a traditional societal practice that is of historical, cultural or archaeological significance to the province, a community, or an aboriginal people. Cultural heritage resources include archaeological sites, structural features, heritage landscape features, and traditional use sites.
Ecosystem-based Management	An adaptive approach to managing human activities, that seeks to ensure the coexistence of healthy, fully functioning ecosystems and human communities. The intent is to maintain those spatial and temporal characteristics of ecosystems such that component species and ecological processes can be sustained, and human well-being supported and improved.
Effectiveness	In the context of wildlife management, effectiveness means the continued use of a habitat by the species that historically utilized it.

Fine-filter management	An approach to maintaining biodiversity that is directed towards particular habitats or individual species whose habitat requirements are not adequately covered by coarse filter management. These habitats may be critical in some way and the species threatened or endangered.
Habitat suitability	A habitat interpretation that describes the current potential of a habitat to support a species. Habitat potential is reflected by the present habitat condition or successional stages.
Landscape connectivity	A qualitative term describing the degree to which late-successional ecosystems are linked to one another to form an interconnected network. The degree of interconnectedness and the characteristics of the linkages vary in natural landscapes based on topography and natural disturbance regime. Breaking of these linkages may result in fragmentation.
Forest fragmentation	Occurs when large continuous forest patches are converted into one or more, smaller patches surrounded by areas disturbed naturally or by human activities.
Green-up	A cutblock that supports a stand of trees that has attained the green-up height specified in a higher-level plan for the area, or in the absence of a higher-level plan for the area, has attained a height that is 3 metres or greater. If under a silvicultural prescription, the cutblock also meets the stocking requirements of that prescription; if not under a silviculture prescription, it meets the stocking specifications for that biogeoclimatic ecosystem classification specified by the regional manager.
Moisture Regime	Describes the relative amount of soil moisture; can be determined from slope position and gradient, soil depth and texture, coarse fragment content, aspect, and sources of seepage. For purposes of terrestrial site description, soil moisture regimes are ranked in the following order from driest to wettest: very xeric (very dry), xeric (dry), subxeric (moderately dry), submesic (slightly dry), mesic (fresh), subhygric (moist), hygric (very moist), subhydric (wet).
Monitoring	Ongoing assessment of how well the goals and objectives of the SRMP are being implemented.
Natural disturbance regime/process	Describes the timing and nature of naturally occurring phenomena, such as fire, windthrow, landslides, and single-tree death that result in changes to ecosystems and landscapes.
Patch Size	In relation to forest harvest, a single cutblock or an aggregation of cutblocks.
Protected Area	A designation for areas of land set aside from resource development activities to protect natural heritage, cultural heritage, or recreational values (includes national park, provincial park, and ecological reserve designations).

Recreation Sites and Trails	Recreation Sites and Trails are public campgrounds and trails located on Crown land outside of parks and settled areas. They provide recreation opportunities generally within an integrated resource management setting. Recreation Sites and Trails were formerly known as Forest Service recreation sites and trails, and were once the responsibility of the BC Ministry of Forests. They are now the responsibility of Recreation Sites and Trails BC (RSTBC) of the Ministry of Forests, Lands and Natural Resource Operations. See www.sitesandtrailsbc.ca .
Red-listed species	List of ecological communities and indigenous species and subspecies that are extirpated, endangered or threatened in British Columbia. Red listed species and sub-species may be legally designated as, or may be considered candidates for legal designations as Extirpated, Endangered or Threatened under the <i>Wildlife Act</i> (see http://www.env.gov.bc.ca/wld/faq.htm#2). Not all Red-listed taxa will necessarily become formally designated. Placing taxa on these lists flags them as being at risk and requiring investigation.
Regeneration Delay	Defined in the <i>Ministry of Forests and Range Glossary of Forestry Terms in British Columbia March 2008</i> : The period of time between harvesting and the date at which an area is occupied by a specified minimum number of acceptable well-spaced trees.
Riparian area	Areas of land adjacent to wetlands or bodies of water such as swamps, streams, rivers or lakes, including both the area dominated by continuous high moisture content and the adjacent upland vegetation that exerts an influence on it.
Riparian Management Zone	An area described under Division 3 [<i>Riparian areas</i>] of Part 4 [<i>Practice requirements</i>], that: (a) is a portion of the riparian management area, and (b) is established to: (i) conserve the fish, wildlife habitat, biodiversity and the water values of the riparian management zone, and (ii) protect the riparian reserve zone, if any, within the riparian management area (Ministry of Forests and Range: 2004).
Riparian Reserve Zone	An area described under Division 3 [<i>Riparian areas</i>] of Part 4 [<i>Practice requirements</i>], that: (a) is a portion of a riparian management area, and (b) is established to protect fish, wildlife habitat, biodiversity and the water values of the riparian reserve zone (Ministry of Forests and Range: 2004)
Seral (forest or stage)	Sequential stages in the development of plant communities [e.g. from young (or early seral) stage to old stage (or old seral)] that successively occupy a site and replace each other over time.
Structural Stage	The existing dominant stand appearance and structure for an ecosystem unit.
Sustainable	A state or process that can be maintained indefinitely. The principles of sustainability integrate three closely interlinked elements — the environment, the economy and the social system — into a system that can be maintained in a healthy state indefinitely.

Timber Harvesting Land Base	Forested Crown land that is currently considered feasible and economical for timber harvesting.
Timber Supply Area	An integrated resource management unit established in accordance with Section 6 of the <i>Forest Act</i> . Timber Supply Areas (TSAs) were originally defined by an established pattern of wood flow from management units to the primary timber-using industries. They are the primary unit for Allowable Annual Cut determinations. A TSA may be subdivided into a number of Timber Supply Blocks.
Visual Quality Objective	A resource management objective established by the district manager, or contained in a higher-level plan, that reflects the desired level of visual quality based on the physical characteristics and social concern for the area. Five categories of VQO are commonly used: preservation, retention; partial retention, modification and maximum modification.
Visually Effective Green-up (VEG)	The stage at which regeneration is seen by the public as newly established forest. When VEG is achieved, the forest cover generally blocks views of tree stumps, logging debris and bare ground. Distinctions in height, colour and texture may remain between a cutblock and adjacent forest but the cutblock will no longer be seen as recently cut-over.
Wildlife tree	A tree or group of trees that has been identified, in an operational plan, to provide present or future wildlife habitat. A wildlife tree is a standing live or dead tree with special characteristics that provide valuable habitat for the conservation or enhancement of wildlife. Characteristics include large diameter and height for the site, current use by wildlife, declining or dead condition, value as a species, valuable location and relative scarcity.
Yellow-listed species	List of ecological communities and indigenous species that are not at risk in British Columbia.

1. Introduction

The Cranberry Sustainable Resource Management Plan (SRMP) is a landscape level plan developed to address sustainable management of land, water and resources in the Cranberry Landscape Unit which is described as Timber Supply Block G, a portion of Timber Supply Block A, and a very small part of Timber Supply Block B of the Kispiox Timber Supply Area (TSA) in west central British Columbia. It is approximately 205,120 hectares in size (see **Map 1: Plan Area** and **Map 2: General Location**).

The extensive forests, rivers, lakes, and wetlands of the Cranberry SRMP area provide habitat to a diverse array of plants, fish, and wildlife. The large predator-prey systems inherent to this area, and their component wildlife species, are key values in this plan and in adjacent plans. The Cranberry SRMP recognizes the importance of conserving key ecological values as well as providing social and economic stability to the people who live in the area.

A number of reports and supporting documents were used in the development of the Cranberry SRMP. To obtain this information, contact:

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<http://www.ilmb.gov.bc.ca/slrp/srmp/north/cranberry/index.html>

1.1 Plan Overview

There are six primary objectives for the Cranberry SRMP:

1. To assist in reaching a broad-based forestry accommodation agreement involving the Province of BC and the Gitanyow, in keeping with the principles of the Province of BC's *New Relationship With First Nations and Aboriginal People*²;
2. To meet the intent of the Nisga'a Final Agreement around consultation;
3. To fulfill legal obligations of the Crown related to the transfer of Skeena Cellulose, as described in the December 30, 2004 B.C. Supreme Court judgement known as the Tysoe decision;
4. To promote sustainable forest management in the SRMP area through a collaborative planning process with the Gitanyow and the Nisga'a Lisims Government (NLG);
5. To assist in streamlining subsequent consultation processes by collaborating with Gitanyow and NLG on strategic land use planning; and,
6. To increase certainty for long-term access and sustainable development for the Gitanyow, NLG and all resource sectors (e.g. forestry, fisheries, tourism and mining).

1.1.1 Plan Goals

The vision and purpose of the Cranberry SRMP are to provide for a wide range of economic opportunities and conserve cultural and environmental resources. Additional goals are:

² These principles, developed in 2005 through meetings between the Province of B.C. and representatives of First Nations and aboriginal peoples, are described in the New Relationship document available online at http://www.llbc.leg.bc.ca/public/PubDocs/bcdocs/407279/new_relationship.pdf

- to develop general and/or site specific objectives, measures and targets to direct timber harvesting operations, while maintaining the range of cultural, environmental, economic and social values in the plan area;
- to provide greater certainty of development potential of the land base, by proactively reducing and/or preventing conflicts on the ground; and,
- to promote opportunities for sustainable economic development.

This plan was developed with the principle of openness of information. During the preparation and finalization of the plan, the Ministry of Forests, Lands and Natural Resource Operations (and the former ILMB) consulted with NLG, the Gitanyow, stakeholders and other government agencies, and also held a public review.

The resulting plan considered the concerns and/or interests expressed during the consultation and public review phases of this planning process. All information used to develop this plan is available upon request, with the exception of that which is legally recognized as confidential under the *Freedom of Information and Protection of Privacy Act*. Third party information used during the planning process may only be released with the approval of the respective third party.

1.1.2 Plan Scope

The Cranberry SRMP describes resource management objectives for:

- Water
- Biodiversity, including old-growth and seral stage forests, rare and endangered plant communities, and connectivity (e.g. ecosystem networks)
- Pine mushrooms
- Wildlife habitat and wildlife, including moose, mountain goat, grizzly bear, fur-bearers and northern goshawk
- Fish habitat and fish, including salmon, steelhead, bull trout, cutthroat trout, rainbow trout, dolly varden and Rocky Mountain whitefish
- Cultural heritage resources, including cultural sites and traditional uses
- Timber
- Special resource management zones

1.1.3 Plan Format

Section 2 of the Cranberry SRMP discusses each resource topic identified above in a separate chapter. All of the resource-focused chapters include the following components:

- **An overview**, which describes the resource value or land use in its local context and outlines area-specific problems, issues or concerns identified during the planning process.
- **Goals**, which broadly describe the desired long-term future condition for the resource or resource use under discussion.
- **Objectives**, which describe the desired future condition for individual aspects of the resource or resource use. Objectives specify outcomes that will achieve identified goals, and are measurable and time-bound.
- **Measures/Indicators**, which set out variables used to track the achievement of an objective.
- **Targets**, which provide objective standards to which resource managers will be accountable.

- **Management Considerations**, which offer greater clarity on the implementation of objectives.

1.1.4 Process Overview

SRMPs address the range of resource values in a region with consideration for both economic interests and environmental stewardship. They are designed to provide strategic-level, overarching management direction for users of Crown land and resources. Forestry, mining, tourism and other uses of Crown land must look to SRMPs to identify what kinds of activities can occur in a particular area and how those activities are to be carried out. The SRMP process is generally technical in nature; it is not a consensus-based process such as that followed in Land and Resource Management Plans (LRMP).

The Cranberry SRMP recognizes the government-to-government relationships that exist between First Nations and the provincial government. As such, the Cranberry SRMP has been developed in partnership with the Gitanyow and NLG, and primarily accommodates their interests.

The SRMP process is comprised of seven key phases:

Phase 1: Process Initiation

- Assemble the planning team.
- Develop a detailed work plan.

Phase 1 Milestone: Detailed work plan completed.

Phase 2: Information Gathering

- Compile existing inventories.
- Develop a Sharepoint Site as an online repository for storing background information and research.

Phase 2 Milestone: Relevant information assembled and specific maps generated.

Phase 3: Plan Development

- Draft the chapters for specific resource value implementation, monitoring and reporting methodology, based on resource management direction from the Nass South SRMP.
- Prepare the draft plan.
- Obtain NLG, Gitanyow and stakeholder agreement on the proposed draft plan.

Phase 3 Milestone: Draft sustainable resource management plan completed.

Phase 4: Government, NLG, Gitanyow and Key Stakeholder Consultation

- Make the draft plan available to government agencies, NLG, the Gitanyow and key stakeholders for their input.
- Revise the draft plan as required.
- Obtain NLG, Gitanyow and key stakeholder agreement on proposed revisions.

Phase 4 Milestone: Revised draft sustainable resource management plan completed.

Phase 5: Public Review

- Hold a 30-day public review period.
- Revise the draft plan to reflect comments received during the public review.
- Obtain NLG, Gitanyow and key stakeholder agreement on proposed revisions.

Phase 5 Milestone: Final draft of sustainable resource management plan completed.

Phase 6: Plan Approval

- Submit final plan to the Minister of Forests, Lands and Natural Resource Operations for approval.
- File the Order.

Phase 6 Milestone: Sustainable resource management plan approved and released.

Phase 7: Data Warehousing

- Warehouse the data sets used for mapping and analysis during plan development.

Phase 7 Milestone: Data loaded to Land and Resource Data Warehouse.

1.1.5 Benefits of the Plan

The Cranberry SRMP promises substantial benefits to the region, in that it will:

a) Address key ecological values

This plan provides objectives to maintain biodiversity values across the land base, as well as habitat features important to key wildlife species. These species include moose, mountain goat, grizzly bear, northern goshawk, fisher and wolverine.

b) Address key social and cultural values

The Cranberry SRMP was developed with extensive input from the Gitanyow and NLG. Forest licencees also provided input, but to a much lesser extent and later on in the planning process. A public review was held to ensure that anyone interested could provide their feedback on the draft plan. In addition, an entire chapter has been devoted to cultural heritage resources.

c) Create opportunities for forest development

This plan provides management direction for forestry activities, in consideration of a range of environmental, social and cultural values and in consultation with the Gitanyow, NLG, key stakeholders, government agencies and members of the general public. The completed SRMP provides the Ministry of Forests, Lands and Natural Resource Operations with the information required to approve and/or implement operational plans.

d) Allow additional issues to be addressed as they arise

The Cranberry SRMP is a living document, which may be revisited within a transparent, clearly defined process, and expanded as the need arises. This version of the Cranberry SRMP focuses on timber development, and offers management direction to balance forest development with environmental, social and cultural values. Additional chapters on resource-based activities, such as mining, oil and gas development and tourism, may be added to the plan at a later date.

1.2 Plan Context

1.2.1 Current Policy Framework for SRMPs

SRMPs address a range of resource values in a region, while considering economic interests and environmental stewardship. They are designed to provide “one-stop shopping” for users of Crown lands and resources. Foresters, tourism operators, land agents and other users of Crown land must look to SRMPs to know what activities are permitted in specific areas, and how those activities are to be carried out.

This document also recognizes the government-to-government relationships that exist between NLG and the Province of B.C. as well as between the Gitanyow and the Province of B.C. As such, development of the Cranberry SRMP has been guided by the following principles:

- Aboriginal rights and treaty rights will not be unjustifiably infringed upon by resource development activities of the Crown or by licensees;
- The Crown and licensees are legally obligated to consider treaty rights and potential existing aboriginal rights in decision-making processes that could lead to impacts on those rights;
- Consultation with NLG will proceed consistent with the *Nisga'a Final Agreement*; and
- Consultation with the Gitanyow will proceed consistent with provincial government policy³.

1.2.2 Planning for Adjacent Areas

The Cranberry SRMP area follows the boundary of the Cranberry Landscape Unit, which was established in 2006. Its eastern portion falls within the Kispiox LRMP area. See **Map 2: General Location**.

The Kispiox LRMP was completed in 1996 then amended in 2001. It is a sub-regional land use plan covering approximately 1.2 million hectares. It was one of the first LRMPs completed in B.C, providing management objectives and strategies for biodiversity, water, fisheries, wildlife, timber and numerous other resource values. The plan also designates resource management zones for protection, special resource management and general resource development. In January 2006, the Kispiox LRMP Higher Level Plan Objectives for Biodiversity, Visual Quality and Wildlife was approved. However, these objectives do not apply to the Cranberry SRMP area or to the Babine West area.

The area to the west of the Cranberry SRMP area is covered by the Kalum Land and Resource Management Plan (LRMP). Although the Kalum LRMP was approved in 2002, it is not legally binding and remains largely as government policy. In April 2006, the Kalum Sustainable Resource Management Plan (SRMP), a landscape level plan, was approved, allowing for the establishment of selected legal objectives and strategies that were outlined in the Kalum LRMP.

The area north of the Cranberry SRMP area is covered by the Nass South SRMP. It was developed to be consistent, to the highest extent possible, with resource management direction in these adjacent areas. It is expected that the Nass South SRMP will be approved concurrently with the Cranberry SRMP.

For further information on these plans, visit <http://ilmbwww.gov.bc.ca/slrp/lrmp/index.html>

³ As outlined by Province of B.C. in *Updated Procedures for Meeting Legal Obligations When Consulting First Nations*, May 2010. http://www.gov.bc.ca/arr/reports/down/updated_procedures.pdf

1.2.3 Resource Use and Development Activity

The following is affirmed with respect to resource use and development activity within the Cranberry SRMP area:

Minerals

- Mineral exploration and development, including road related resource development, is permitted in all zones, subject to standard regulatory approval processes and conditions.
- Existing mineral tenure rights are not diminished by the Cranberry SRMP.
- New mineral tenures can be staked and recorded on all mineral lands in accordance with the *Mineral Tenure Act* and Regulations.

Timber

- The Cranberry SRMP supports opportunities for timber harvesting for commercial or local use, provided these are consistent with applicable forest legislation, plan objectives, and zoning requirements.

Commercial recreation and tourism

- The Cranberry SRMP allows development of facilities and infrastructure for commercial recreation and tourism, consistent with applicable tenure and permit requirements. A tourism chapter may be developed at a later time, to provide further direction to commercial recreation, tourism activities, and tourism sector development.

Non-commercial recreation

- Recreation Sites and Trails are managed using an approach that integrates resource uses on Crown land outside of parks, protected areas, and municipalities.
- Recreation reserves identify public recreation interests and significant resource features in order to manage them within a coordinated and integrated resource framework.

Guide-outfitting

- Land management activities will be carried out to sustain existing guide-outfitting opportunities.
- Guide-outfitters will be notified of proposed resource development activities consistent with applicable forest legislation, plan objectives, and zoning requirements.
- Industrial proponents and guide-outfitters will be encouraged to work co-operatively to accommodate guide-outfitting values, resource values, and resource development operations.

Hunting and fishing

- Hunting and fishing are recognized activities.
- Local / resident hunters and anglers will be notified of proposed resource development activities consistent with applicable forest legislation, plan objectives, and zoning requirements.
- NLG will be consulted, in accordance with the *Nisga'a Final Agreement*, on planning and management that potentially affects these activities.
- NLG treaty rights to fish and wildlife as defined in the *Nisga'a Final Agreement* will be protected.

Trapping

- Existing trapping tenures are recognized.
- Trap-line holders will be notified of proposed resource development activities consistent with applicable legislation, plan objectives, and zoning requirements.

Cultural Heritage Resources

- The Gitanyow and Nisga'a have gathered information on archaeological sites, traditional use areas, and trails.
- Cultural heritage information of traditional, social, or spiritual importance is protected from disclosure by the *Freedom of Information and Protection of Privacy Act*.
- Cultural heritage resources will be further protected and managed in accordance with applicable legislation, policies, procedures, agreements, and protocols.

1.3 Plan Area

The Cranberry SRMP area is approximately 205,120 hectares in size. It extends northwest from the Kitwanga River to the Cranberry River, and northeast to the Upper Kispiox River (see **Map 1: Plan Area**).

Several lakes exist within the plan area. These include Kitwanga Lake, Douse Lake, Aluk Lake, Derrick Lake, and Borden Lake.

Rivers in the plan area include the Kitwanga, Cranberry, Upper Kispiox, Nangeese, Weber, Kitwancool, Deuce and Upper Mill Creek.

Other geographic features that delineate the Cranberry SRMP area include Mount Weber, the Nass Range which encompasses much of the area's southwest edge and the Kuldo Range in the northwest.

Topography of the Cranberry SRMP area is predominantly valley-bottom and mountainous in the southwest. The climate is relatively coastal (moist and cold), with greater snow depths compared to areas more inland.

The extensive forests, rivers and lakes provide many opportunities for public recreation. There are two recreation sites totaling 75 hectares: Bonus Lake and Derrick Lake, and six recreation reserves totaling 445 hectares.

1.3.1 Ecosystems

The Cranberry SRMP area is divided into two main Ecosections including the Nass Basin, Nass Ranges and bordering the Northern Skeena Mountains. Ecosections are units under the ecoregion classification system⁴, and represent areas of minor physiographic and macroclimatic or oceanographic variation. An Ecosection typically encompasses a number of biogeoclimatic zones. Biogeoclimatic zones are classes of ecosystems under the influence of the same regional climate. In sum, these zones can be further stratified into subzones and variants, classifying them into smaller and smaller distinct ecosystem and plant association units. The major difference between the ecoregion classification and the biogeoclimatic ecosystem classification (BEC) is that, in mountainous terrain, ecoregion classification stratifies the

⁴ Demarchi, D.A. 1988. Ecoregions of British Columbia. Map at 1:2 000 000. B.C. Ministry of Environment, Wildlife Branch, Victoria, B.C.

landscape into geographical units that circumscribe all elevations, whereas BEC delineates altitudinal belts of ecological zones within geographical units⁵.

Within the Cranberry SRMP area, the Nass Basin Ecosystem includes Interior Cedar Hemlock (ICH) subzones as well as the Engelmann Spruce-Subalpine Fir (ESSF) zone at higher elevations. Southwest of the Nass Basin, the Nass Ranges Ecosystem includes the Mountain Hemlock and Coastal Western Hemlock zones in the south as well as the ESSF, Boreal Altai Fescue Alpine (BAFA) and the Coastal Mountain Heather Alpine (CMA) zones. See Table 1 below for a description and **Map 3: Ecosystems and Biogeoclimatic Zones**, for a graphical representation of these zones.

⁵ Pojar, J. and D. Meidinger. 1991. Chapter 2: Concepts. D. Meidinger and J. Pojar, Eds. Research Branch, B.C. Ministry of Forests, Victoria, B.C. pp. 21, 29.
Available on-line at: <http://www.for.gov.bc.ca/hfd/pubs/Docs/Srs/SRseries.htm>

Table 1. Biogeoclimatic Zones in the Cranberry SRMP Area

<i>Biogeoclimatic Zone</i>	<i>Characteristics⁶</i>
Interior Cedar Hemlock (ICH)	<p><u>ICHmc1</u>: Covers the undulating terrain of the Nass Basin north, east and west of Cranberry Junction. Elevations in the Cranberry SRMP area range from a minimum of 320 metres (along tributaries that flow into the Cranberry River) to a maximum of 1100 metres.</p> <p>Characterized by western hemlock and subalpine fir forests with moss ground cover. Subalpine fir and Roche spruce dominate on low-lying, wetter sites. Lodgepole pine is the dominant seral species, with trembling aspen and paper birch common, especially on south-facing slopes.</p> <p><u>ICHmc2</u>: Extends from the Kitwanga River north along the Cranberry River. Elevation range from 100 m to approximately 750 m. This subzone is dominant in major valleys characterized by western red cedar and seral forests of trembling aspen, paper birch, Roche spruce, lodgepole pine and subalpine fir.</p>
Coastal Western Hemlock (CWH)	<p><u>CWHws2</u>: Occurs on mid-mountain slopes and in higher valleys such as the Upper Cranberry watershed. Elevation range in the Cranberry area from 600 m to 1000 m. Forests of amabilis fir, western hemlock, mountain hemlock and subalpine fir.</p>
Engelmann Spruce-Subalpine Fir (ESSF)	<p><u>ESSFwv</u>: Lies above the ICH and CWHws2 in the Cranberry area from approximately 900 m to 1550 m elevation. Forests dominated by subalpine fir, with lesser components of mountain hemlock, hybrid white spruce and western hemlock. Above this subzone is a corresponding parkland subzone/variant denoted as ESSFwvp being transitional from treeline to true alpine tundra.</p>
Mountain Hemlock (MH)	<p><u>MHmm2</u>: The leeward variant of the MHmm, found along the central and eastern slopes of the Coast and Hazelton Mountains. In the Cranberry area, found above the CWHws2 near the Kiteen River. Mountain hemlock, western hemlock, amabilis fir and subalpine fir are the characteristic tree species. Above this subzone is a corresponding parkland subzone/variant denoted as MHmmp occupying transition from treeline to true alpine tundra.</p>
Alpine Tundra (AT)	<p>Reclassified into the Boreal Altai Fescue Alpine (BAFA) and Coastal Mountain Heather Alpine (CMA) zones⁷. CMA occurs on high mountains in the Nass Ranges above the MH. BAFA occurs on mountain tops in the interior above the ESSF.</p>

⁶ <http://www.for.gov.bc.ca/hfd/pubs/docs/Lmh/Lmh26.htm>

⁷ The Interior Mountain Alpine (IMA) zone is also a result of the Alpine Tundra reclassification, but this does not occur in the Cranberry area.

1.3.2 Communities

The Village of Gitanyow is the only community within the plan area. It is situated along the Kitwanga River a few kilometres from Highway 37. It is about 20 km north of Kitwanga, located near the junction of Highways 16 and 37 (just south of the Cranberry SRMP area). Gitanyow is approximately 130 km south of Meziadin Junction on Hwy 37, 260 km east of Prince Rupert and 500 km west of Prince George.

Gitanyow is a First Nations reserve community of the Gitksan people, and is a National Historic Site of Canada. As of May 2011, there were 789 registered Gitanyow members; 420 of them are living off-reserve. Gitanyow was formerly named Kitwancool. The band government changed its name from the Kitwancool Band to the Gitanyow Band in 1991. In 1994 the Gitanyow Hereditary Chiefs, the governing body of the band, renamed themselves Sim-Gi-Get'm Gitanyow and asked that localities on the Kitwancool Indian reserve henceforth be identified as Gitanyow.

Gitanyow is home to some of the oldest-known and largest collection of totem poles in British Columbia. The famous Canadian painter Emily Carr, following a visit to the region in 1928, captured many of the totem poles at this village in her paintings. Ancient totems, carving sheds and a graveyard contribute to the site. Although some of the totem poles are replicas of the originals which are being preserved at the Royal British Columbia Museum in Victoria, many have stayed in place, including the "Hole in the Ice" totem, erected circa 1850.

1.3.3 Historical Land and Resource Use

The river has long served First Nations for thousands of years, both spiritually and as a source of food, encompassing a number of fish including species of migrating salmon, various types of trout and as a hunting ground for moose and deer.

1.3.4 Current Economic Profile

Most livelihoods in this region are tied to the resource-extractive industries and to the health of the natural environment.

The Allowable Annual Cut for the Kispiox TSA, in which the Cranberry SRMP area is located, is 1,087,000 cubic metres. **See Map 4: Timber Harvesting Landbase, Appendix F and Appendix G.** There are four forest licencees within the Cranberry SRMP area: BC Timber Sales - Skeena, Gitksan Forest Enterprises Inc., Pacific BioEnergy Timber and Stella-Jones Canada Inc. (previously Bell Pole). All licencees are harvesting below their Allowable Annual Cuts (AAC). The AAC is apportioned according to the following table, from *Ministry of Forests and Range – Apportionment System, TSA AAC, Apportionment and Commitments*, as of March 31, 2011.

Table 2. Kispiox TSA Apportionment of AAC

Description	AAC (cubic metres/yr)
Forest Licencees Replaceable	542,245
GFEI	387,879
Stella-Jones Canada Inc.	55,414
Pacific BioEnergy Timber	87,571

0736238 B.C. Ltd.	11,381
Forest Licences Non-Replaceable	255,522
BCTS Timber Sale Licence	254,233
Community Forest Agreement	10,000
Woodlot Reserve	10,000
Forest Service Reserve	10,000
TOTAL	1,087,000

There is very little economic activity occurring within the community itself; however, when the Kitwanga Lumber Company was previously operating in Kitwanga (Gitwangak), 20 km south of Gitanyow, the mill produced about 36 million board feet of various dimension lumber products for US and export markets and consumed about 150,000 cubic metres of timber annually. The mill stopped operating in the fall of 2008. The forests in the area are largely comprised of decadent hemlock, which reduces their suitability for traditional forestry operations but significantly increases the amount of fibre available for biomass applications. In September 2009, Pacific BioEnergy Corporation (PBEC) purchased the mill with the intention of it being a cornerstone provider of fibre required for a wood pellet production facility it planned to develop. However, the mill remained closed until June 2011. In July, Premier Christy Clark was on location to celebrate its grand re-opening. A news release issued on July 8, 2011 (http://www2.news.gov.bc.ca/news_releases_2009-2013/2011PREM0084-000843.pdf) noted the Kitwanga lumber mill's return to production directly generated 45 mill jobs and another 45 indirect jobs in logging, hauling, silviculture and support services and supplies. However, the mill was only able to remain open for a few months and is now closed again.

Currently, it is estimated that 80 per cent of Kitwanga's production is for domestic markets across Canada, with the other 20 per cent destined for China, Japan and Korea. Kitwanga mainly mills dimension lumber and square timbers from western hemlock, balsam, and some cedar. Fibre is supplied via the Terrace-based company PacFor, which manages three forest licences that provide the Kitwanga sawmill with an estimated 150,000 cubic metres of timber annually. Pacific BioEnergy has an Allowable Annual Cut of 87,571 cubic metres for its replaceable forest licence (at March 31, 2011) and is pursuing an agreement with the Gitanyow to supply another 100,000 cubic metres per year to the sawmill. The company is also exploring fibre supply opportunities with the Gitxsan.

Pacific BioEnergy will be focussing its attention on development of a wood pellet manufacturing plant. They are currently working towards identifying a site for the plant and on meeting engineering and environmental challenges. In addition to the Kitwanga sawmill, Pacific BioEnergy owns and operates a Prince George wood pellet plant, one of the largest in North America.

BC Timber Sales (BCTS) was founded in 2003 with a mandate to provide the cost and price benchmarks for timber harvested from public land in British Columbia. Through 12 Business Areas and an operational presence in 33 locations, BCTS manages about 20 percent of the provincial Crown allowable annual cut. The Skeena Business Area of BC Timber Sales geographically encompasses the Kalum, North Coast, and Skeena-Stikine (Kispiox TSA portion) Forest Districts. The administrative and management centre for the business area is located in Terrace and a separate Field Office is maintained in Hazelton. BCTS has an

Allowable Annual Cut apportionment of 254,233 cubic metres as of March 31, 2011 for its timber sale licence program in the Kispiox TSA.

Gitxsan Forest Enterprises Inc. (GFEI), based in Hazelton (outside the Cranberry SRMP area) was established in 2006 and purchased Forest License A16831 in April of 2007. GFEI is owned and operated by the Gitxsan Chiefs. The company has an Allowable Annual Cut of 387,879 cubic metres as of March 31, 2011 for its replaceable forest licence. GFEI's timber license predominantly supports the growth of hemlock and balsam fir. Its timber is shipped out of the ports in Kitimat, Prince Rupert and Stewart.

In 2006, Stella-Jones Inc. acquired the assets and operations of Bell Pole Company ("Bell Pole"), a manufacturer of wood utility poles, with its closest mill situated in Terrace. This acquisition included the transfer of the forest licence held by Bell Pole. It has an Allowable Annual Cut of 55,414 cubic metres (as of March 31, 2011).

Stella-Jones Inc. is a leading North American producer and marketer of industrial treated wood products, specializing in the production of pressure-treated railway ties as well as wood poles supplied to electrical utilities and telecommunications companies. Other principal products include marine and foundation pilings, construction timbers, highway guardrail posts and treated wood for bridges. The company also provides customized services to lumber companies and wholesalers for the treatment of consumer lumber products for outdoor applications.

There is no retail business in Gitanyow, aside from sales of convenience items at the Gitanyow Gas Bar. It is located close to the totem poles and offers gas, diesel, tax exemption for fuel and cigarette purchases, has free parking for RV's, pay phones, rest rooms, slushies, soft ice cream and a convenience store. Other services can be found 20 km south in Kitwanga (Gitwangak), which is just outside the Cranberry SRMP area boundary. There you can find the Kitwanga Coffee Cup, Terry's Tax & Bookkeeping, Dollops Kitwanga Auto Service for vehicle repairs, and the Kitwanga General Store featuring a Home Hardware and a large Petro-Canada with a café at the junction of Highways 16 and 37.

The Cassiar RV & Campground is also located in Kitwanga. It is situated next to the Kitwanga River about four km from Hwy 37. This facility has a sani-dump and is close to hiking trails. There is also a rustic camping facility at the Kitwanga Centennial Park across the street from Dollops Kitwanga Auto Service.

Also located in Kitwanga is the Kitwanga Fort - a National Historic Site of Canada. The Kitwanga Fort is associated with the aboriginal warrior Nekt from the 18th century. Nekt strategically located the fort on Ta'awdzep or Battle Hill to have a vantage point over the adjacent Kitwankul Trail and the Kitwanga River Valley.

In May 2011, the Northwest Transmission Line (NTL) project received approval by both the federal and provincial governments. The NTL is an approximately 344-kilometre, 287 kilovolt transmission line between Skeena Substation (near Terrace) and a new substation to be built near Bob Quinn Lake. It is designed to provide an interconnection point for future industrial development and clean power projects in Northwest B.C. Construction is expected to be complete by the end of 2013, and is estimated to cost between \$364 and \$525 million. A portion of this line falls within the Cranberry SRMP area.

This new transmission line will:

- Provide a reliable supply of clean power to potential industrial developments in the area;
- Provide a secure interconnection point for clean power generation projects; and,

- Potentially assist certain northwest communities in accessing the electricity grid, rather than obtaining their power from diesel generators.
- Create up to an estimated 280 direct jobs per year of construction

For more information, see http://www.bchydro.com/planning_regulatory/transmission_projects/ntl.html.

1.4 Nisga'a and Gitanyow

1.4.1 Introduction

This section incorporates the independent perspective and position of the Gitanyow and NLG on matters relating to the Cranberry SRMP. The main purpose of this section is to provide the reader with background on the Gitanyow and Nisga'a, and to afford both groups full elaboration on their viewpoint. This includes contrasting views on the nature of aboriginal rights and title in the plan area.

The position of the Province is that it has Crown title to the land and resources within the Cranberry SRMP area, and that it has exercised sovereignty in British Columbia from 1846, subject to the provisions of the *Nisga'a Final Agreement*⁸.

The issue of aboriginal rights and title as well as the jurisdiction over lands and resources is not a subject addressed by the SRMP process or its resultant products.

Nothing in this SRMP serves to limit or define any aboriginal rights, aboriginal title, Crown title, or treaty rights. The Province has continuing legal obligations to consult and seek workable accommodation with the Gitanyow and NLG, in accordance with any applicable consultation protocol, before the approval of specific development proposals that have the potential to impact any aboriginal rights of the Gitanyow or treaty rights of the Nisga'a Nation.

Gitanyow have claimed traditional territory that covers the entire plan area, and as such, the Province has engaged the Gitanyow in meaningful consultations towards the eventual reconciliation of interests. Gitanyow aboriginal rights are recognized and affirmed under Section 35 of the *Constitution Act, 1982*⁹.

NLG, as a Treaty Nation, has a unique role within the SRMP process, and is guided by the specific rights and obligations detailed in the *Nisga'a Final Agreement*. Nisga'a treaty rights are also recognized and affirmed under Section 35 of the *Constitution Act, 1982*.

1.4.2 Nisga'a Nation

The Nisga'a Nation, Canada and British Columbia entered into the *Nisga'a Final Agreement* on May 11, 2000. The *Nisga'a Final Agreement* is a treaty and land claims agreement within the meaning of sections 25 and 35 of the *Constitution Act, 1982*. Specific rights and obligations of the Nisga'a Nation, British Columbia and Canada are identified within the *Agreement*.

In addition, under the *Nisga'a Final Agreement*, the Nisga'a Nation and Nisga'a citizens have certain rights in the Cranberry SRMP area (see **Map 7: Nisga'a Nation Areas of Ownership and Interest**) within the Nass Area and Nass Wildlife Area, including:

⁸ *Nisga'a Final Agreement – Initiated August 4, 1998.*

⁹ Section 35 of *Constitution Act, 1982.*

- Rights to harvest wildlife and migratory birds
- Rights to harvest fish and aquatic plants
- Rights of access

The *Nisga'a Final Agreement* also establishes a number of joint Nisga'a / Provincial / Federal committees to facilitate the planning of certain activities within the Nass Area and Nass Wildlife Area. The two committees relevant to the Cranberry SRMP are the Joint Fisheries Management Committee (JFMC) and the Nass Wildlife Committee.

The Nisga'a Nation has concerns about certain First Nations' claims and land use plans, to the extent that they encroach on the Nass Wildlife Area and Nass Area, as defined in the *Nisga'a Final Agreement*.

Nisga'a Lisims Government does not accept that any First Nation other than the Nisga'a Nation has ever had aboriginal title or rights over the Nass Wildlife Area and that part of the Nass Area within the planning area. Nisga'a Lisims Government considers any assertion of such aboriginal title or rights by any other First Nation to be illegitimate, and therefore considers the land use plans of any other First Nations to be illegitimate to the extent that they encroach on the Nass Wildlife Area and that part of the Nass Area within the Cranberry SRMP area.

1.4.2.1 *Joint Fisheries Management Committee*

The Joint Fisheries Management Committee (JFMC) is tasked under the terms of the *Nisga'a Final Agreement* with facilitating co-operative planning and conducting of Nisga'a fisheries and enhancement initiatives in the Nass Area, and making recommendations to NLG and the Minister. The JFMC is a body with representatives from the Nisga'a Nation, Government of Canada and the Government of B.C. that ensures the fisheries provisions of the *Nisga'a Final Agreement* are implemented and adhered to. This includes calculating annual allocations for salmon harvests by the Nisga'a, conducting required stock assessments and developing management strategies, and helping to ensure the preservation, recovery and enhancement (where appropriate) of fish species within the Nass Area. A Joint Technical committee is tasked with supporting the JFMC.

1.4.2.2 *Nass Wildlife Committee*

The Nass Wildlife Committee is tasked under the terms of the *Nisga'a Final Agreement* with facilitating wildlife management within the Nass Wildlife Area and making recommendations to NLG and the Minister. The Nass Wildlife Committee is a body with representatives from the Nisga'a Nation, Government of Canada and the Government of B.C. that ensures the wildlife provisions of the *Nisga'a Final Agreement* are implemented and adhered to. This includes recommending wildlife harvest levels for designated species, addressing wildlife conservation needs, developing annual management plans, and carrying out other duties to facilitate proper wildlife management within the Nass Wildlife Area.

1.4.3 **Gitanyow**

1.4.3.1 *History / Political Organization*

The Gitanyow Huwilp comprises eight historic units known as *wilp* (house[s] pl.: *huwilp*), which are the social, political and governing units of the Gitanyow. The Gitanyow are aboriginal peoples as defined in the Canadian constitution and international law, with aboriginal rights and title on their territories recognized and protected under those laws. They are not a band or a "First Nation", which is commonly used as though synonymous with "Indian Band" as defined by the *Indian Act*.

While each Wilp is an independent land-owning unit, the Gitanyow Huwilp work together under the auspices of the Gitanyow Hereditary Chiefs on issues that affect them as a whole. The Gitanyow Wilp *Lax Yip* (territories) collectively forms the Gitanyow Territory. A description of the Gitanyow governing structure can be found in the draft *Gitanyow Ayookwx / Constitution*.

Each Gitanyow Wilp has a long history that is told in their *adawaak*, which describes the ancient migrations of the Wilp, its acquisition and defence of its territories, and major events in the life of the Wilp. These sacred histories are portrayed on Wilp *ayuuks* (crests) and depicted on their regalia and *git'mgan* ("birth" poles, more commonly known as totem poles) that tie them to their lands. These *git'mgan* currently stand at the ancient village site in Gitanyow, testimony to the sacred connection between the Wilp, its lands and its ancestors.

Gitanyow history, social organization and territories are well documented, and can be found in a number of publications including *Tribal Boundaries on the Nass Watershed* (Sterritt *et al.* 1998), *Histories, Laws and Territories of the Kitwancool* (Duff 1959) and *Totem Poles of the Gitksan, Upper Skeena River, British Columbia* (Barbeau 1929).

The Gitanyow Huwilp Territories (the Territory) covers the area from Kitwancool Lake, or Gitanyow Lake, in the south, north to the Bell One Bridge on the Bell-Irving River, and from Kitsault Lake in the west to Bonny Lakes in the east, for a total of approximately 6 200 square kilometres. Gitanyow's main village is situated on Highway 37, approximately 20 kilometres north of Kitwanga Junction.

1.4.3.2 *Perspectives*

The Cranberry SRMP planning area covers portions of the territories of five Gitanyow Huwilp (Houses) in the Nass and Skeena watersheds. These are the Lax Yip (House Territories) of Gwass Hlaam, Gwinuu, Gamlaxyeltxw, Malii, and Wiitaxhayetsxw, which encompass an area of approximately 210,000 hectares or 2,100 square kilometres.¹⁰ See **Map 8: Gitanyow Claimed House Territories and Treaty Settlement Lands Offer (2002)**.

Within the last 10 years, Canadian courts have delivered a number of important decisions related to aboriginal rights and Crown use of aboriginal territories. This evolving body of law provided an impetus on the Provincial Crown to engage aboriginal groups in consultation and where necessary, to accommodate those interests before making decisions which could impact aboriginal rights and title. While Gitanyow welcomed these decisions as a way to end many years of struggle, uncertainty and destruction of their lands, it brought new frustrations as they sought the means to enable government to fulfil their legal obligations.

Forest harvesting development and activities have resulted in huge impacts on Gitanyow territories and resources. As the demand on Gitanyow forest resources has grown, increasing the Gitanyow Hereditary Chiefs' consultation workload, the Gitanyow Hereditary Chiefs became convinced that a territorial land use plan was necessary to sustainably manage resource development, protect Gitanyow interests and values, and address the Huwilp concerns. The following interests, values and concerns are written from the Gitanyow perspective. Some of them were identified in the draft Gitanyow Cranberry-Kispiox Land Use Plan, and include:

- A. Our responsibility to uphold the Gitanyow Ayookwx (law) that compels each Wilp Chief to ensure that the lands and resources of the Wilp Lax Yip are managed so as to ensure that they can provide for future generations of the Wilp (houses);

¹⁰ Personal Communication Wil Marsden, Geographic Information Systems Technician, Gitanyow Hereditary Chiefs, Feb 18, 2008.

- B. The exercise of our constitutionally recognized aboriginal title rights, which were found by the Supreme Court of Canada in *Haida*¹¹, to have three characteristics:
- i. The right to exclusive use and occupation;
 - ii. The right to choose how the land is used; and
 - iii. An “inescapable” economic component;
- C. The recognition that Gitanyow house members utilize all their land on their territories, including swamps, streams and lakes, to carry out their culture of hunting, fishing, trapping, food and medicinal plant gathering, and spiritual worship, and to uphold their traditional laws. A diversity of ecosystems and forest conditions including streams, swamps, springs, lakes, areas of mature and old forest, areas of young forest and new growth, dense forest and clearings are required to produce the variety of plants, birds, animals, and fish that are harvested and utilized; and
- D. The recognition that Gitanyow values and interests are directly connected to and reliant upon the presence and quality of their ecological resources. Sustaining the land is central to sustaining Gitanyow culture and providing for their economics.

Gitanyow have a strong interest in conservation and management of the forests of the Cranberry SRMP area:

- to protect the non-timber values of the land
- as a means to mitigate climate change
- as an alternative (to timber harvesting) means of generating revenue from the forest through the sale of carbon credits.

Gitanyow supports and encourages the Province of B.C. in forest conservation measures and has a strong interest in forming partnerships with government for selection and management of conservation forests, sale of carbon credits, and sharing of carbon credit revenues.

1.4.3.3 *View of the Cranberry SRMP*

- A. The Gitanyow expect the completed SRMP to provide:
- i. Identification and protection for Gitanyow Huwilp areas of:
 - a) High ecological sensitivity and importance;
 - b) Individual wilp traditional use sites;
 - c) Old-growth values required for some traditional-use activities and exercise of Wilp rights;
 - ii. Identification of Gitanyow Huwilp cultural heritage and economic resources, including:
 - a) Traditional-use sites,
 - b) Traditional uses,
 - c) Resources specific to Gitanyow; and
 - d) Gitanyow interests for current and future use of their territories, to develop and sustain Gitanyow culture, society and economy;

¹¹ Supreme Court of Canada decision issued Nov. 18, 2004, known as *Haida Nation v. British Columbia (Minister of Forests)*.

- iii. Management objectives and strategies to achieve sustainable use of all forest resources on Gitanyow Territories within the Cranberry SRMP area;
 - iv. Identification and adequate protection for high value habitat sites (i.e., “critical” grizzly bear habitat) to preserve the ecological integrity of the territories; and
 - v. Identification of the level of harvest that can be sustained during most foreseeable market conditions.
- B. The SRMP represents a preliminary reconciliation of Gitanyow and Crown interests with respect to timber harvesting on Gitanyow Territory in the Cranberry SRMP area;
- C. Completion and implementation of the SRMP follows the guidance of the Court as set down in *Haida* and will allow for stability and certainty with respect to the management of Gitanyow territories and resources and industrial forest development on those territories;
- D. The completion of the Cranberry SRMP on Gitanyow Huwilp Territories in the Cranberry SRMP area as described in the December 2005 Project Charter is an important component of Land Use Planning committed to by B.C. in the Gitanyow Forestry Agreement;
- E. The next step of that commitment is the identification of a process to merge the Cranberry and Nass SRMPs to encompass the whole of the Gitanyow Traditional Territory;
- F. Completion of a legally implemented land use plan for the whole of Gitanyow Territory supports the vision of the Gitanyow Huwilp, which includes:
- i. Reconciliation of interests and co-existence with the Crown and third parties;
 - ii. The establishment and implementation of a sustainable land use plan for the whole of the Gitanyow Territory and its resources;
 - iii. Sharing the wealth of the territory; and
 - iv. Shared decision-making on Gitanyow Territories with B.C. through the Gitanyow Joint Resources Council (JRC) which has a mandate to implement, manage and monitor the over-all land use plan;
- G. Such a plan would be consistent with Gitanyow’s “strength of claim” as found by Justice Tysoe in 2002 and confirmed by him in 2004 and in provincial consultation policy related to strength of claim.

2. Management Direction

The Cranberry SRMP is results-based in that it focuses on desired future outcomes rather than on the means of achieving those outcomes. The purpose of this approach is to allow people implementing the plan the flexibility to be innovative while using their best professional judgement to achieve desired results. Being results-based, the Cranberry SRMP also allows operational planners to adjust their methods as new information becomes available.

The Cranberry SRMP has been prepared using the best available information and data, with the understanding that technology and knowledge of ecosystems and resources is constantly being upgraded. Should a particular objective, indicator or target be deemed inappropriate, or should a zone be identified as needing adjustment, the plan may be revisited and revised at a later date, according to the processes outlined in Section 3: Plan Implementation, Monitoring and Amendment.

2.1 Water

2.1.1 Overview of Water

The Cranberry SRMP area is situated within the Kitwanga, Kispiox, Nangeese, Kiteen and Cranberry river watersheds and includes many tributary streams. The main streams and many of the tributary streams provide highly productive habitat for fish. Traditionally, lakes and streams provided water of high quality for Nisga'a Nation and Gitanyow consumption. Currently, Gitanyow village takes domestic water from a subsurface well source, with the exception of one home that takes surface water from a spring.

Ten Link Creek is designated as a Community Watershed. Gitanyow village used to take water from a reservoir on Ten Link Creek. Currently there are plans for expansion of the village to the east side of Highway 37; Ten Link Creek is planned as the future water supply for the village expansion (Philip Daniels, personal communication).

Gitanyow village is located on the river flood plain, immediately upstream of the junction of Kitwanga River and Kitwancool Creek.

Extensive logging of river and tributary streams, flood plains and upland areas has resulted in removal of riparian vegetation and stream bank damage, erosion, and siltation of streams and lakes. Fish habitat in main streams, tributary streams, and lakes has been negatively impacted. Several studies related to watershed hydrology and watershed restoration projects have assessed some of the streams, documented the impacts of road construction and timber harvesting on the streams and habitats and have presented recommendation for restoration of the watershed.

As logging continues, road construction and timber harvesting will occur on increasingly steeper and broken, gullied terrain, at higher elevations, and further upstream within the steep, broken, gullied valleys of the Kitwanga, Kitwancool, Moonlit, Cranberry, Kiteen, Kispiox, and Nangeese rivers and tributary streams. The amount of soil exposure and potential for erosion and siltation will increase, as will the potential for slope failures. The foreseeable result will be a negative impact on water quality and quantity, and fish habitat.

Water quantity and quality (including peak flows, low flows, turbidity, temperature, and chemistry) is of primary importance to the Nisga'a Nation and Gitanyow. Traditionally, the most important resource available to residents was the various fish species that were found in the river and lakes (Petzelt, 1998); fishing sites were located on the Kitwanga and Cranberry river systems. Currently, within the Kitwanga

River system, Sockeye salmon stocks, the species of greatest importance to them, have drastically declined. Gitanyow now take the majority of their Sockeye salmon from the Meziadin-Nass river system (Glen Williams, personal communication).

At a broader perspective, water is the most precious resource on earth; the survival of living organisms depends on water. Climate change will have, and is presently having, major impacts on water quality, volume and availability worldwide. Preservation and protection of water quality within the Cranberry SRMP area in consideration of climate change is of primary importance for present and future generations of all people locally, and potentially provincially, nationally, and internationally.

Concerns regarding water include:

- Rising water temperatures.
- Beaver dams that block Coho access to the upper Kitwanga River.
- Drastic declines in Sockeye salmon stocks of the Kitwanga River.
- Lack of protection for small streams, springs, wetlands, lakes, and swamps.
- Further negative impacts to water quality and fish stocks in the Kitwanga, Cranberry, Nangeese and Kispiox river systems as a result of timber harvesting.
- The potential for severe flooding upstream from Gitanyow village and the resulting damage to village infrastructure.
- The water quality of Ten Link Creek, and the spring that supplies water to Alice Good's home in Gitanyow, for domestic water supply. The desire is to maintain pure water for domestic consumption.
- Damage to the flood plain of the Cranberry River, blockage to fish spawning streams by beaver dams, and the stranding of fish fry in backwaters after high water recedes.
- Within the Cranberry river system, the potential for pollution of water by mushroom picker camps (i.e. from latrines, garbage disposal, abandoned vehicles, etc.).

Anecdotal evidence suggests that the majority of stream crossings in the plan area are in good condition with respect to sediment risk; however, ongoing stream assessments are required to evaluate and deal with risk. Road building and timber harvesting on alluvial fans and floodplains are identified as high risk activities due to the instability and dynamic nature of these hydrological features. Presently, the biggest risk to water quality in the plan area is from existing roads that are failing and eroding. A large amount of the road network in the plan area falls within what has been perceived as a jurisdictional grey area (non-status roads), with maintenance and deactivation now the responsibility of the provincial government.

Legal requirements for managing water quality and fish habitat already exist under the *Forest and Range Practices Act*, the *Forest Planning and Practices Regulation* and the *Fisheries Act*. This plan only establishes objectives that are not already addressed in other legislation. A key component of management under the *Forest and Range Practices Act* is effectiveness monitoring. This is done to determine if forest practices are meeting management objectives. The Forest and Range Evaluation Program (FREP) has developed two protocols related to water:

1. Protocol for Evaluating the Potential Impact of Forestry and Range Use on Water Quality (Water Quality Management Routine Effectiveness Evaluation).
2. Protocol for Evaluating the Condition of Streams and Riparian Management Areas (Riparian Management Routine Effectiveness Evaluation)

Benthic invertebrate monitoring is another tool for evaluating the health of streams. Both the FREP Protocols and benthic invertebrate monitoring are valuable strategic tools for evaluating the effectiveness of current practices for managing water quality and hydrology, and for developing data that could be used to increase the effectiveness of practices to protect riparian resources.

2.1.2 Management Direction for Water

Plan Goal for Water

Protect and maintain surface and groundwater to:

- provide a safe and sufficient drinking water supply that supports healthy communities.
- maintain water quality, quantity, peak and low flows within the range of natural variability in rivers, streams, lakes, and wetlands to protect the hydrological integrity of their watersheds (water quality includes temperature, turbidity and chemistry).

Objectives	Measures/Indicators	Targets
1.0 <i>Limit the potential for soil surface erosion</i>	1.1 Number of occurrences of exposed erodible soil ¹² >5 m ² caused by industrial activities: <ul style="list-style-type: none"> • that are within the first 10 metres of the riparian area past the edge of the stream, river, lake, or wetland, or, • that are hydrologically connected¹³ to a river, stream, lake or wetland, except: <ul style="list-style-type: none"> • active, seasonally or temporarily de-activated haul roads, or, • where no practicable alternative exists and timely mitigating measures are implemented to 	0

¹² An exposed erodible soil is a fine textured soil (fine sand, silt and clay) or erodible mineral deposit that water can readily wash into the adjacent stream.

¹³ *Hydrologically connected* means any bare, erodible soil that can reasonably be expected to reach the riparian area if exposed to rainfall or stream flows. This includes:

- bare soil on non-vegetated slopes immediately adjacent to the 10 m riparian zone
- bare soil on vegetated slopes of 10% gradient or steeper that are immediately adjacent to the riparian area, up to the first topographic break.
- bare soil past the topographic break if there is a channel showing a clear connection to the first 10 m of the riparian area
- bare soil on active road surfaces within the 10 m riparian area, including the crossing, if there is evidence that fines eroded off the road surface can reach the stream. This includes the road surface, plus all cut-and-fill slopes associated with the road, within the first 10 m of the riparian area
- bare soil on active road surfaces beyond the first 10 m of the riparian area if there is evidence that fines eroding off these road surfaces will reach the stream. Evidence of hydrologic linkage should be conspicuous, such as ruts or eroding tracks down the road to a spot at the crossing where water spills directly off the edge of the road into the stream or a ditch that is clearly connected to the riparian feature.

(FREP *Protocol for Evaluating the Condition of Streams and Riparian Management Areas*, Version 5.0; March 2009, and, FREP *Field Supplement to Evaluating the Condition of Streams and Riparian Management Areas*, Version 3.0; March 2009).

Hydrologically connected is not intended to be applied to active, seasonally, and temporarily de-activated roads; these roads will be managed by implementation of Best Management Practices and Measure 1.2.

Objectives	Measures/Indicators	Targets
	prevent siltation of water bodies.	
	<p>Management Considerations</p> <ul style="list-style-type: none"> • The intent of this measure is that there will be no erodible soil exposure. The maximum area is intended to provide flexibility to licensees for occasional small, dispersed incidental occurrences. • The intent is that construction of new roads and future deactivation of existing roads will be completed to a standard, using Best Management Practices that will result in no roads being hydrologically connected to any stream, river, lake, or wetland. • Best Management Practices (BMP) should be established for minimizing soil surface erosion within the plan area. • BMP's should consider road density, road proximity to water courses and number of stream crossings. • Application of best available information to be applied in managing soil surface erosion prior to the development of BMP's. • Hydrologically connected is not intended to be applied to active, seasonally, and temporarily de-activated roads; these roads will be managed by implementation of Best Management Practices and Measure 1.2. • Monitoring should be done over time to determine if the area is a reasonable figure. This figure may be increased or decreased as appropriate. 	
	<p>1.2 Percent of stream crossings on new roads that have appropriate mitigating measures implemented to prevent soil deposition into the stream in accordance with a professionally-conducted risk assessment.</p>	100%
<p>2.0 <i>Manage human activities to maintain the hydrologic stability of watersheds</i></p>	<p>2.1 Number of watersheds identified on Map 9: Watersheds with Equivalent Clearcut Area Thresholds where a hydrologic assessment is completed prior to any harvesting that would cause the thresholds identified in Table 3: Equivalent Clearcut Area (ECA) Thresholds for Watersheds to be exceeded, except for cut blocks that:</p> <ul style="list-style-type: none"> • are approved under section 196(1) of the <i>Forest and Range Practices Act</i>; • are declared areas under section 14(4) of the <i>Forest Planning and Practices Regulation</i>; or • have a cutting permit in place. 	
	<p>Management Considerations</p> <ul style="list-style-type: none"> • The intent is to permit the harvest of existing blocks, but to require hydrologic assessments prior to any further harvesting that would cause the thresholds to be exceeded. 	

Objectives	Measures/Indicators	Targets
	<ul style="list-style-type: none"> Hydrologic assessments should be conducted by a qualified professional who will use the assessment to provide guidance for future operations. The assessment does not necessarily have to be a complete Coastal or Interior Watershed Assessment. 	
<p>3.0 <i>Maintain ecological functioning of streams, rivers, wetland complexes and lakes, including those that do not support populations of fish.</i></p>	<p>3.1 Number of rivers and streams where industrial activity has caused significant consequences for fish habitat or human water consumption by the following disturbances to channel beds or banks:</p> <ul style="list-style-type: none"> channel bank erosion; channel aggradation, degradation or dewatering; or change in channel morphology. 	0
	<p>3.2 Number of rivers, streams, lakes, and wetlands that maintain riparian reserves and resource management zones around riparian features as outlined in Table 4.</p>	100%
	<p>3.3 Number of rivers, streams, lakes, and wetlands where blow down within the RRZ and/or RMZ is retained as large woody debris.</p>	100%
<p>Management Considerations</p> <ul style="list-style-type: none"> “Significant” relates not to the level of disturbance but to the consequence of disturbance. A small disturbance could have a large consequence and a large disturbance could have a small consequence. Industrial developments include, but are not limited to; timber harvesting, road construction, building of permanent facilities. Operations should consider larger Riparian Reserve Zones (RRZ) than specified under the <i>Forest and Range Practices Act</i> for retention where possible. Where economically and operationally feasible, selectively remove only the high value trees within the Riparian Management Zones (RMZ). Where feasible, concentrate wildlife tree retention areas around riparian ecosystems. Consider preservation of riparian habitat values, water quality, rare ecosystems and windthrow susceptibility when assessing and designing RMZs. Consider retention levels of 70% to 100% basal area on all streams of Riparian Class S4. Monitoring of retention levels to consider: <ul style="list-style-type: none"> - Level of retention; - Incidence of windfall; - Changes in stream temperature and turbidity; - Effectiveness of small scale connectivity habitats through cutblocks. Apply adaptive management principles in management of riparian features. 		

Objectives	Measures/Indicators	Targets
	<ul style="list-style-type: none"> Establish water monitoring stations on selected water bodies for long term evaluation of water quality and quantity attributes (water quality includes temperature, turbidity and chemistry). Terrain stability to be considered in relation to its impact on water quality and quantity before logging. Baseline information should be gathered for watershed sub-basins prior to development. Information to consider: <ul style="list-style-type: none"> - Equivalent Clearcut Area. - Road densities in high elevations. - Road densities for the entire sub-basin. 	
	<p>3.4 Number of rivers and streams in riparian classes S1 to S4 where industrial activity has either:</p> <ul style="list-style-type: none"> added large woody debris that would not naturally be in the channel; or removed naturally deposited large woody debris; <p>Except where necessary to satisfy safety considerations.</p>	0
	<p>3.5 Number of new roads and trails that prevent ground water from reaching natural groundwater receiving sites.</p>	0
<p>Management Considerations</p> <ul style="list-style-type: none"> Natural groundwater drainage patterns can be maintained with adequate cross drains in roads and trails. 		
<p><i>4.0 Maintain the functional integrity of floodplains and alluvial fans</i></p>	<p>4.1 Proportion of floodplains and alluvial fans where functional integrity is maintained.</p>	100%
<p>Management Considerations</p> <ul style="list-style-type: none"> Timber harvesting is generally not recommended on floodplains and alluvial fans. Road building on fans and floodplains is risky and requires the advice of a qualified professional. Access across floodplains and alluvial fans is permitted to access timber beyond these features. 		
<p><i>5.0 Restore the water quality and hydrologic integrity of damaged watersheds throughout the plan area</i></p>	<p>5.1 Proportion of watersheds with damaged water quality or hydrological integrity where primary causes of watershed damage have been adequately addressed by:</p> <ul style="list-style-type: none"> natural processes; or, operationally and financially feasible activities that do not cause further damage or interfere with natural restoration processes, where funding is available. 	100%

Objectives	Measures/Indicators	Targets
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Intent is to pursue funding to conduct watershed restoration work, but recognize that funding is not guaranteed. • A Watershed Restoration Plan (WRP) should be developed that includes: <ul style="list-style-type: none"> ○ Identification of damaged or threatened watersheds; ○ A cost benefit analysis to prioritize watershed restoration opportunities with respect to conserving, restoring and improving fisheries values in the plan area; ○ Prioritization of WRP projects should be based on vulnerability of fish stocks, social and economic value of fish stocks, level of negative impact, and ecological and economic feasibility; ○ A risk assessment should be undertaken to prioritize road deactivation work with respect to water quality and fisheries impacts; ○ Conduction of an assessment of the 26-Mile Road within the flood plain of the Kitwanga River; determine measures required to restore the integrity and function of the flood plain. ○ Conduction of an assessment of the sockeye beach spawning habitat; determine measures required to restore the spawning habitat associated with Gitanyow Lake. 	
<p><i>6.0 Maintain the watershed of Ten Link Creek as a community watershed to provide domestic water supply to Gitanyow village</i></p>	<p>6.1 Number of industrial developments within the Ten Link Creek watershed (see Map 19: Parks and Land Use Areas).</p>	<p>0</p>

Table 3. Equivalent Clearcut Area (ECA) Thresholds for Watersheds

Base Watershed (WSD)	ECA Threshold (%)
Aluk	26.2
Borden	21.7
Cranberry	27.1
Cranberry East	24.8
Cranberry West	24.9
Derrick	22.5
Douse	25.3
Extra	26.2
Ginmiltkun	28.5
Kiteen	27.6
Kitwancool	28.5
Lower Kitwanga	22.5
McKnight	27.3
Mill	25
Moonlit	26.5
Nangeese	26.7
Tsugwinselda	25
Upper Kitwanga	26.2
Upper Kispiox	28.1
Weber	28.3

Table 4. Retention Targets in Riparian Reserve Zones (RRZ) and Riparian Management Zones (RMZ)

Riparian Class	Reserve Zone Width - Minimum (m)	Retention - Minimum (%)	Management Zone Width - Minimum (m)	Retention - Minimum (%)
<u>Streams:</u>				
S1 (large rivers ≥ 100m width)	See Biodiversity Objective 7 (Ecosystem Network) and associated Measures, Targets and Management Considerations for large, ≥ 100 m width rivers such as the Nass River – <u>K'alli Aksim Lisims</u> .			
S1 (specific rivers)	See Biodiversity Objective 7 (Ecosystem Network) and associated Measures/Indicators, Targets and Management Considerations for specific S1 rivers.			
S1 (except large and specific rivers)	50	100	20	0
S2	30	100	20	0
S3	20	100	20	0
S4	0	n/a	30	0
S5	0	n/a	30	0
S6	0	n/a	20	0
<u>Wetlands:</u>				
W1	10	100	40	0
W2	Not applicable: no W2s in the plan area			
W3	0	n/a	30	0
W4	Not applicable: no W4s in the plan area			
W5	10	100	40	0
<u>Lakes:</u>				
L1	10	100	20	0
L2	Not applicable: no L2s in the plan area			
L3	n/a	n/a	30	0
L4	Not applicable: no L4s in the plan area			
Notes:				
1. Reserve and RMZ retention percentage means the percentage of naturally occurring pre-harvest forest basal area and structure of mature and old forest that occupies (or historically occupied) the site.				
2. Reserves and management zones around all riparian features may be increased in size and % retention to meet management objectives for other resources.				

2.2 Biodiversity

According to the *Biodiversity Guidebook – Forest Practices Code of British Columbia* (Parminter *et al* 1995), biological diversity (synonymous with “biodiversity”) is “the diversity of plants, animals, and other living organisms in all their forms and levels of organization and includes the diversity of genes, species, ecosystems, and the evolutionary and functional processes that link them.”

This section of the Cranberry SRMP has been a focal point of discussion and negotiation, in an effort to craft a balanced approach to maintaining landscape functionality in areas subject to resource extraction and development. Consideration has also been given to the need to maintain biological capital and options, given an uncertain future, in an attempt to address climate change.

2.2.1 Overview of Biodiversity

Biogeoclimatic Zones

Biological diversity within the plan area is governed by time in association with climate, geology, ecology and land use. Within the Cranberry SRMP area, five distinct forested biogeoclimatic zones and associated variants are represented (see **Map 3: Ecoregions and Biogeoclimatic Zones**):

- Coastal Western Hemlock, Wet Subarctic Subzone, Montane Variant (CWHws2)
- Interior Cedar-Hemlock, Moist Cold Subzone, Nass Variant (ICHmc1)
- Interior Cedar-Hemlock, Moist Cold Subzone, Hazelton Variant (ICHmc2)
- Mountain Hemlock, Moist Maritime Subzone, Leeward Variant (MHmm2)
- Engelmann Spruce-Subalpine Fir, Wet Very Cold Subzone (ESSFwv)
- Boreal Altai Fescue Alpine (BAFA)
- Coastal Mountain Heather Alpine (CMA)

The latter two were the result of a reorganization of the Alpine Tundra biogeoclimatic zone classification that took effect in January 2006.

Natural Disturbance Types

Biogeoclimatic subzones within the province are described in terms of five natural disturbance types (NDTs) identified in the *Biodiversity Guidebook*. Each NDT is based upon the historical sizes and frequencies of naturally occurring disturbance events such as fire, insect outbreaks, windthrow and landslides.

The ESSFwv and MHmm2 zones within the plan area are considered Natural Disturbance Type 1 (NDT1): ecosystems with rare stand-initiating events.

Historically, NDT1 forest ecosystems were usually uneven-aged or multi-storied even-aged, with regeneration occurring in gaps created by the death of individual trees or small patches of trees. Disturbances caused by wind, fire and landslides were generally small, and resulted in irregular edge configurations and landscape patterns. The mean return interval for these disturbances is generally about 350 years for the ESSFwv and MHmm2 biogeoclimatic zones.

The ICHmc1, ICHmc2, and CWHws2 zones are classed as Natural Disturbance Type 2 (NDT2): ecosystems with infrequent stand-initiating events. Historically, NDT2 forest ecosystems were usually even-aged, but extended post-fire regeneration periods produced stands with uneven-aged characteristics, such as multi-storied forest canopies. The predominant natural-disturbance mechanism was wildfire, generally of moderate size (20 to 1 000 hectares), with occasional very large fires. The landscape was dominated by extensive areas of mature forest surrounding patches of younger forest. For such natural

disturbances, the average return interval is about 200 years, resulting in vast areas being in old-growth climax condition of 250 years or more.

The Cranberry SRMP presents some of the biodiversity objectives for the plan area by natural disturbance type, to reflect the differences in climate as well as differences in size and scale of the natural disturbance events that created the diversity of forest ecosystems.

Fine and Coarse Filter Approaches

Biodiversity is typically managed from two concurrent perspectives: the fine filter approach and the coarse filter approach.

The **fine filter approach** provides direction to specific environmental accounts/species where negative impacts have already been manifested, or where specific management direction is required to maintain ecosystem health and population viability.

The Cranberry SRMP offers fine filter direction for the various environmental and species accounts. The preservation and conservation direction for rare ecosystems in this section is considered a fine filter approach to biodiversity.

The **coarse filter approach** attempts to manage for biodiversity in ecosystems with the basic assumption that most species' habitat needs will be met by managing forests to maintain structural features and mimic natural disturbance processes such as fire and wind events, and attacks from insects and disease – thereby maintaining a range of habitats across the landscape.

Coarse filter biodiversity is addressed in part by the Cranberry SRMP through management direction on:

- Seral stage distribution
- Patch size distribution
- Landscape connectivity
- Ecosystem networks
- Old-growth management areas
- Tree species diversity
- Stand structure retention and recruitment
- Wildlife trees and wildlife tree retention areas

Planning and management for maintenance of biodiversity occurs at various scales, from the stand level to inter-regional levels that consider continental species migration and contingencies for catastrophic stochastic events or adjustments to global climatic shifts.

The first six items in the bulleted list above reflect landscape-level biodiversity provisions; the latter two reflect stand-level biodiversity provisions. Each of these elements is discussed in more detail below. Management direction for aquatic biodiversity has not been covered in this plan.

Seral Stage Distribution

As defined in the *Biodiversity Guidebook*, seral stages are “the stages of ecological succession of a plant community, for example, from the young stage to the old stage; the characteristic sequence of biotic communities that successively occupy and replace each other, altering in the process some components of the physical environment over time.” A diversity of seral stages creates a diversity of habitat types across the landscape.

Patch Size Distribution

The *Biodiversity Guidebook* defines a patch as “a stand of similar aged forest that differs in age from adjacent patches by more than 20 years. When used in the design of landscape patterns, the term refers to the size of either a natural disturbance [fire, wind, insects] opening that led to even aged forests, or an opening created by [forest harvest] cutblocks.”

Different patch sizes and shapes create a diversity of habitats, thus contributing to the maintenance of biodiversity.

Landscape Connectivity

The *Biodiversity Guidebook* defines connectivity as “a qualitative term that describes the degree to which late successional ecosystems [old forests] are linked to one another to form an interconnected network ... Breaking of these linkages results in forest fragmentation. Fragmentation due to forest harvesting should be viewed and managed to mimic fragmentation resulting from natural disturbance.”

The Cranberry SRMP directs the maintenance of forest connectivity, by “managing the matrix” and establishing ecosystem networks.

Ecosystem Networks and Managing the Matrix

“Managing the matrix” implies managing landscape elements:

- maintaining stand-level structural retention,¹⁴
- maintaining a diversity of patch sizes and seral stages,

to reduce the effects of habitat loss and forest fragmentation.

Ecosystem Networks (EN) of the Cranberry SRMP are landscape corridors focussed around streams, lakes, and wetlands. The EN encompasses the full hydrosiparian zone.

Ecosystem Networks protect hydrosiparian ecosystems, capture biodiversity “hotspots”, high habitat values, Old Growth Management Areas, important wildlife movement corridors, and Gitanyow cultural features; facilitate migration of plant and animal species and gene pools through the landscape, and serve to connect habitats across all elevations. Ecosystem Networks also contribute to achievement of seral stage and patch size targets, and serve to shift the focus of forestry activities from “timber to be removed” to “forests to leave standing”, such that a portion of the landscape has less emphasis on intensive forestry activities that alter the natural stand structure and seral and patch size distribution.

Old Growth Management Areas

The *Biodiversity Guidebook* defines old growth management areas as “areas that contain or are managed to replace specific structural old-growth attributes, and that are mapped out and treated as special management areas”. Refer to **Map 10: Old Growth Management Areas**.

Tree Species Diversity

Cranberry SRMP area forests feature a wide variety of tree species. Coniferous species include western hemlock, mountain hemlock, subalpine fir, amabilis fir, western red cedar, lodgepole pine and sitka-Engelmann-white spruce hybrids. Deciduous species include white birch, trembling aspen, black cottonwood, and red alder.

¹⁴ Natural disturbances rarely kill all the living trees within the patch that the disturbance affects, and rarely removes trees from the site. Residual and downed trees provide habitat that would otherwise be missing while the young forest regenerates, thus providing connectivity between the old and newly regenerating forests.

Following natural disturbances, forests regenerate to a variety of species, depending on the sites' moisture and nutrient regime, elevation, aspect and the nature of the disturbances. Tree species diversity, and genetic diversity within species, both contribute to the resilience of forest ecosystems – their ability to combat, recover from, or adjust to disease, insect infestations, climatic variations and other disturbances. Additionally, a diversity of species enhances forests' potential to produce a variety of forest habitats and timber products.

Stand Structure Retention and Recruitment

In the *Biodiversity Guidebook*, stand structure refers to the distribution of trees in a stand, which can be described in terms of species, vertical or horizontal patterns of trees, size of trees or tree parts, age, or a combination of these. Stand structure includes living, standing dead and fallen dead trees (“coarse woody debris”). A diversity of stand structure provides a diversity of habitats; large old trees, decadent trees with cavities, snags, and downed trees provide habitats generally not found in young and mature managed forests.

Full-cycle retention trees are live trees deliberately left standing within harvested cutblocks, with the intent that they will never be harvested. Such trees become snags (standing dead trees), fall to the ground and become coarse woody debris, and eventually decay and decompose into soil – thus completing their full cycle.

Full-cycle retention trees may be retained in patches of various sizes in specific locations on a cutblock, as single trees dispersed more or less evenly across a cutblock, or in combinations of patches and single trees. Patch retention appears to be the more suitable system to provide wildlife tree habitat; single tree retention provides a better dispersion of large coarse woody debris across the cutblock for soil and water conservation and nutrient cycling.

Throughout the harvested landscape, full-cycle retention trees provide necessary linkages between the regenerating young forest and the original old forest, and contribute to forest health and sustainability by providing an array of ecological services.

Wildlife Trees and Wildlife Tree Retention Areas

Retained trees are referred to in Forest Stewardship Plans and *Forest Planning and Practices* regulations as “wildlife trees and wildlife tree retention areas”. A wildlife tree retention area (also known as a group reserve) is an area specifically identified for the retention and recruitment of suitable wildlife trees.

2.2.2 Management Direction for Biodiversity

Plan Goals for Biodiversity

- Ensure ecosystem function across the range of ecosystem types, reflective of the historic natural disturbance regime at the landscape and stand level over time.
- Maintain habitat connectivity throughout the landscape.
- Connect old-growth management areas (OGMAs).
- Provide a continuum of relatively undisturbed habitats that possess interior forest conditions for indigenous species that depend on mature and old-growth forests.
- Facilitate movement and dispersal of organisms across the landscape by providing core areas and dispersal corridors that will help a variety of organisms re-colonize their historic range.
- Protect and maintain effectiveness of riparian habitats; all riparian habitats have disproportionately high biodiversity values relative to their proportional occupancy of the landscape.
- Preserve Gitanyow and Nisga’a traditional use sites and maintain opportunities for traditional uses of the land.

Objectives	Measures / Indicators	Targets
1.0 <i>Maintain a landscape pattern of patchiness that, over the long term, reflects the natural disturbance pattern</i>	1.1 Distribution and range of patch sizes by natural disturbance type within the forested area of the plan area.	Refer to Table 5. Recommended Distribution of Patch Sizes
	Management Considerations <ul style="list-style-type: none"> • Small patch sizes (<40 ha) should include a range of openings, from 0.1 ha to 40 ha. • Large patches should be cut to form the large openings (80 ha to 250 ha). In order to achieve large patches through time, they should also be identified as leave areas, and retained to provide future opportunities for large patches for harvest. • Patch-size analysis will include existing openings greater than 250 ha, no new openings are to exceed 250 ha. • Patch sizes in Table 5 and management considerations should be updated based on best available information (e.g., monitoring data; assessments of the range of historic variability in landscape patterns when these become available). 	
2.0 <i>Maintain or recruit structural attributes of old</i>	2.1 Percent of representative wildlife tree retention within cutblocks.	Refer to Table 6. Wildlife Tree Targets

Objectives	Measures / Indicators	Targets
<i>forests to support stand-level biodiversity</i>	<p>Management Considerations</p> <ul style="list-style-type: none"> • Refer to Appendix A: General Wildlife Tree Management Guidelines. • Document the contribution of wildlife tree retention in an appropriate record system. • Where practicable, promote partial logging in stands conducive to shade tolerant tree species management. 	
<p>3.0 <i>Preserve red-listed (endangered or threatened) plant communities, as classified by the B.C. Conservation Data Centre</i></p>	<p>3.1 Hectares of red-listed plant communities¹⁵ harvested, except:</p> <ul style="list-style-type: none"> • where required to access timber that otherwise would be isolated from harvest beyond the core area. • where terrain conditions such as slope gradient, or terrain stability constrain road locations and dictate that sections of road enter and leave red-listed plant communities to access timber that otherwise would be isolated from harvest. • where access is required for mineral development. • where no practicable alternative exists. 	<p>0 ha</p>
	<p>Management Considerations</p> <ul style="list-style-type: none"> • For the most up-to-date list of rare ecosystems, refer to the Conservation Data Centre list of rare and endangered plant communities, located online at www.env.gov.bc.ca/cdc/index.html • Red-listed plant communities encountered during field operations are to be preserved from harvesting. • Although red-listed plant communities smaller than the stated minimum size are not required to be preserved, it is desirable to preserve them by including them in wildlife tree retention areas or other forms of stand-level retention. 	

¹⁵ The minimum size of red-listed plant community to be preserved is 0.25 ha. Where the red-listed plant community exists as the dominant component of a complex, the minimum size of complex to be preserved is 1 ha.

Objectives	Measures / Indicators	Targets
	<p>3.2 Percentage of red-listed plant communities having their ecological integrity maintained, except:</p> <ul style="list-style-type: none"> • to access timber that otherwise would be isolated from harvest beyond the core area. • where terrain conditions such as slope gradient, or terrain stability constrain road locations and dictate that sections of road enter and leave red-listed plant communities to access timber that otherwise would be isolated from harvest. • where access is required for mineral development. • where no practicable alternative exists. 	100%
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Best efforts are to be made to establish wind firm buffers around red-listed plant communities, to preserve their ecological integrity from industrial development. The intent of the buffer is to maintain conditions of soil chemistry, moisture, light, and temperatures that sustain the ecosystem. It is recognized that wind firm buffers are not always practicable. 	
<p>4.0 <i>Conserve blue-listed (at risk) plant communities, as classified by the B.C. Conservation Data Centre</i></p>	<p>4.1 Proportion of each blue-listed plant community¹⁶ within a cutblock retained, when 100% retention is not practicable.</p>	Minimum of 70% by area or basal area
	<p>Management Considerations</p> <ul style="list-style-type: none"> • For the most up-to-date list of at-risk ecosystems, refer to the Conservation Data Centre rare and endangered plant communities list online at http://www.env.gov.bc.ca/cdc/index.html • Although blue-listed plant communities smaller than the stated minimum size are not required to be preserved, it is desirable to preserve them by including them in wildlife tree retention areas or other forms of stand level retention. 	
<p>5.0 <i>Maintain a diversity of coniferous and</i></p>	<p>5.1 Proportion of cutblocks, at free-growing stage, with a diversity of species ecologically appropriate to the site.</p>	100%

¹⁶ The minimum size of blue-listed plant community to be preserved is 0.25 ha. Where the blue-listed plant community exists as the dominant component of a complex, the minimum size of complex to be preserved is 1 ha.

Objectives	Measures / Indicators		Targets
<i>deciduous species that represent the natural species composition at the landscape and stand levels</i>	Management Considerations <ul style="list-style-type: none"> Wherever practicable, site prescriptions should accept and retain, advanced regeneration, poles and saplings, to contribute to the regeneration of the site. Best efforts are to be made, during planting and other post-harvesting operations, to promote western red cedar where ecologically suitable. Incremental silviculture (stand-tending) is to consider maintaining all existing ecologically acceptable (including deciduous) species in the developing stand. On ecologically suitable sites where hemlock, balsam, and cedar are not planted, facilitate natural regeneration by maintaining these species as a component of full-cycle retention trees dispersed throughout cutblocks. 		
	5.2 Net loss of area, other than for infrastructure, of areas greater than one contiguous hectare, having more than 50% deciduous trees by basal area.	0 ha	
	Management Considerations <ul style="list-style-type: none"> It is recognized that natural loss of deciduous stands occurs. Best efforts are to be made to minimize the loss of deciduous stands resulting from primary forest activities. Periodic disturbance (e.g. harvesting and wildfire) is required to perpetuate deciduous dominated stands. Management of deciduous stands will require stocking standards that allow for deciduous species as preferred and acceptable species. 		
6.0 <i>Maintain a range of forest seral stages by BEC variant, that reflects the natural disturbance regime</i>	6.1 Percentage of early, mature and old seral forest retained in each BEC variant.	Refer to Table 7. Seral Stage Targets	
	6.2 Hectares of forest harvested in OGMA shown on Map 10: Old Growth Management Areas , without an approved amendment.	0 ha	
	Management Considerations <ul style="list-style-type: none"> The OGMA amendment process is to follow the current approved policy: Old Growth Management Area Amendment Policy – Skeena Region. Allow natural processes (e.g. fire, insects) to occur within OGMA ecosystems, except where these processes threaten resources outside the OGMA. OGMAs are to provide a percentage of old-growth retention by BEC variant across the plan area. Primary considerations to determine the location of OGMAs include: <ul style="list-style-type: none"> Old growth forests (greater than 250 years old). 		

Objectives	Measures / Indicators	Targets
	<ul style="list-style-type: none"> ○ Biogeoclimatic Variant representation. ○ Areas not contributing to the timber harvesting land base first, followed by constrained areas; strive for overlap with the Ecosystem Network, High Value Grizzly Bear Habitat, Moose Winter Range, Mountain Goat Winter Range, Gitanyow Offer Parcels and Cultural Sites, and Visual Quality Objectives (see Map 5: Visual Quality Objectives). ○ Avoid proposed cutblocks and proposed roads. ○ Spread timber harvesting land base impact evenly amongst all forest licensees. ○ Interior forest conditions within OGMA (>600 metres in length and width). ○ Gitanyow House Territory representation. ○ Follow natural features (streams, ridges, roads, cutblock edges, etc.) and metes and bounds as opposed to forest cover lines. ○ Capture small amounts of non-forest or young forest if completely surrounded by old growth in a larger OGMA. • Secondary considerations to determine the location of OGMA, secondary to the listed primary considerations: <ul style="list-style-type: none"> ○ Connectivity values. ○ Rare or uncommon ecosystems, where known and mapped. ○ Special habitats (e.g. goshawk habitat areas, fur-bearer denning sites). 	
<p>7.0 <i>Maintain structural connectivity in the Ecosystem Network identified on Map 11: Ecosystem Network</i></p>	<p>7.1 Proportion of the Ecosystem Network hydroriparian zone harvested for reasons other than those listed in Table 8. Rationale for Amending the Ecosystem Network.</p>	<p>0%</p>

Objectives	Measures / Indicators	Targets
	<p>Management Considerations</p> <ul style="list-style-type: none"> • The hydroriparian zone is a key value of the Ecosystem Network (EN). In general, the EN depicted on Map 11: Ecosystem Network is the best approximation of the hydroriparian zone utilizing aerial photos, mapped topography and digital elevation models. Linework delineating the upper edge of the EN is intended to mirror the edges of the hydroriparian zone. • The EN identified on Map 11: Ecosystem Network for Nass River-Beverly Creek, Gitanyow Lake, Moonlit, Kitwancool, Tsugwinselda, and Aluk creeks, and Kitwanga, Cranberry, Kispiox, Kiteen, and Nangeese rivers account for the hydroriparian zone and Gitanyow interests. • The amendment process for the EN will be the same as for spatially identified OGMAs, with the exception of the following circumstances: <ul style="list-style-type: none"> ○ Under item 4 of Table 8. Rationale for Amending the Ecosystem Network, licensees can proceed in the field with minor amendments to the EN, with notification of these amendments to the Gitanyow and Nisga’a Lisims Government after the fact, except for the rivers, streams, and lakes listed in item 4, which will require a major amendment. • Allow natural processes (e.g. fire, insects) to occur within the EN, except where these processes threaten values or resources adjacent to EN. 	
	<p>7.2 Road length within the EN other than roads constructed:</p> <ul style="list-style-type: none"> ○ To access timber that otherwise would be isolated from harvest beyond the EN. ○ Where terrain conditions such as slope, gradient or terrain stability constrain road locations and dictate that sections of road enter and leave the EN to access timber that otherwise would be isolated from harvest. ○ Where no practicable alternative exists. 	0 km
	<p>7.3 Proportion of the 200 metre width Ecosystem Network buffers identified on Map 11 that meet the forest conditions listed in Table 9.</p>	100%
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Where the hydroriparian zone (HRZ) reserve and/or the buffers include portions of harvested cutblocks, the interior old forest conditions will be developed over time by re-growth of the harvested forest. • The EN (HRZ plus buffers) is intended to provide interior old forest conditions <u>throughout the full length of each EN corridor.</u> 	

Table 5. Recommended Distribution of Patch Sizes

(harvest units and leave areas, source: Biodiversity Guidebook, 1995)

Natural disturbance type (NDT)	Biogeoclimatic (BEC) zone variant	Percentage of Forest Area within SRMP Area		
		<i>Small patches</i> (<i><40 ha</i>)	<i>Medium patches</i> (<i>40 to 80 ha</i>)	<i>Large patches</i> (<i>80 to 250 ha</i>)
NDT 1	MHmm2	30 to 40	30 to 40	20 to 40
	ESSFwv	30 to 40	30 to 40	20 to 40
NDT 2	CWHws2	30 to 40	30 to 40	20 to 40
	ICHmc2	30 to 40	30 to 40	20 to 40
	ICHmc1	30 to 40	30 to 40	20 to 40

Table 6. Wildlife Tree Targets

(Forest and Range Practices Act Regulations)

Management Unit	Area of any individual cutblock to be retained as wildlife trees	Area of total harvested cutblocks (annual harvest) to be retained as wildlife trees
Cranberry SRMP	≥3.5 %	≥12%

Table 7. Seral Stage Targets

Management Unit	Biodiversity Emphasis Option	Biogeoclimatic Ecosystem Classification variant	Seral stage	Age (yrs)	Forest area (%)
Gitanyow Territory within the Cranberry SRMP (except for Upper Kispiox Special Management Zone portion)	Intermediate	ESSFwv	Early	<40	<22
			Mature + Old	>120	>36
			Old	>250	>19
		MHmm2	Early	<40	<22
			Mature + Old	>120	>36
			Old	>250	>19
		CWHws2	Early	<40	<36
			Mature + Old	>80	>34
			Old	>250	>9
		ICHmc1	Early	<40	<36
			Mature + Old	>100	>31

Management Unit	Biodiversity Emphasis Option	Biogeoclimatic Ecosystem Classification variant	Seral stage	Age (yrs)	Forest area (%)
			Old	>250	>9
		ICHmc2	Early	<40	<36
			Mature + Old	>100	>31
			Old	>250	>9
Gitanyow Territory within the Cranberry SRMP (only the Upper Kispiox Special Management Zone portion)	High	ESSFwv	Early	<40	<17
			Mature + Old	>120	>54
			Old	>250	>28
		ICHmc1	Early	<40	<27
			Mature + Old	>100	>46
			Old	>250	>13

Table 8. Rationale for Amending the Ecosystem Network

Acceptable Rationale for Amendment	Major or Minor Amendment	Allowable Amendment
1. Access issues that were overlooked or unknown during the initial Ecosystem Network delineation, where no practicable alternative exists (refer to Biodiversity Measure 7.2).	Minor	<ul style="list-style-type: none"> To establish an appropriate road width through the Ecosystem Network.
2. To account for cut blocks in place prior to the establishment of the Ecosystem Network, including those: <ul style="list-style-type: none"> approved under section 196(1) of the <i>Forest and Range Practices Act</i>; as declared areas under section 14(4) of the <i>Forest Planning and Practices Regulation</i>; or that have a cutting permit in place 	Minor	<ul style="list-style-type: none"> To the edge of the cut block, temporarily, to allow timber harvest. Return to original location following completion of timber harvest and silvicultural responsibilities.
3. To address a compelling forest health issue (e.g. a forest pest or disease is established in the Ecosystem Network and spreads to the point where it threatens adjacent values and resources outside the Ecosystem Network).	Minor	<ul style="list-style-type: none"> To the extent necessary to eliminate the threat to the land and water adjacent to the Ecosystem Network.
4. New data and information such as ground truthing of the	Major for the following rivers and creeks:	<ul style="list-style-type: none"> To improve the degree to which the Ecosystem

<p>hydroriparian zone¹⁷, new resource inventories, First Nations cultural sites and updated wildlife mapping. Notwithstanding the exceptions detailed under items 1 to 3 above, in no case will the Ecosystem Network be smaller than the hydroriparian zone.</p>	<ul style="list-style-type: none"> • Nass River mainstream/ Beverly Creek • Gitanyow Lake • Moonlit Creek mainstream • Kitwanga River mainstream • Kitwancool Creek mainstream • Cranberry River mainstream • Tsugwinselda Creek • Kispiox River mainstream • Nangeese River mainstream • Aluk Creek <p>Minor for all other portions of the Ecosystem Network</p>	<p>Network captures values for First Nations, provides habitat for wildlife, or generally benefits biodiversity.</p> <ul style="list-style-type: none"> • To increase the accuracy of the Ecosystem Network in terms of how it maps the hydroriparian zone.
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Table 9. Forest Conditions within Ecosystem Network Buffers

<ul style="list-style-type: none"> • Continuous forest cover • Small discontinuous canopy gaps • $\geq 70\%$ structure and function¹⁸ retained, including large, old trees, snags, and coarse woody debris • Multi-canopy levels, multi-aged forest • In conjunction with the forested core, maintain interior old forested conditions ≥ 200 metres in width • 0% permanent road access, except where, for ecological or economic reasons, no other alternative is possible.
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2.3 Botanical Forest Products

2.3.1 Overview of Botanical Forest Products

Botanical forest products are non-timber based products gathered from forest and range land. The Ministry of Forests, Lands and Natural Resource Operations has grouped botanical forest products into the following categories: wild edible mushrooms, floral greenery, medicinal and pharmaceutical products, wild berries and fruits, herbs and vegetable products, landscaping products, craft products, and

¹⁷ The hydroriparian zone is defined as the area that extends to the edge of the influence of water on land, or land on water, as defined by plant communities (including high bench or dry floodplain communities) or landforms, plus one and one-half site specific tree heights horizontal distance (Hydroriparian Planning Guide, Coast Information Team, Jan. 30, 2004). Landforms include:

- The stream channel, lake or wetland and adjacent riparian ecosystem, where no floodplain exists.
- The full width of the floodplain for streams
- Adjacent active fluvial units
- Up to the top of the inner gorge or where slopes become less than 50% for reaches of streams that are gullied, or are in a ravine or canyon
- Immediately adjacent unstable slopes (class IV and V terrain) where it is located such that a surcharge of sediment may be delivered to the stream, lake or wetland.

¹⁸ Any harvest unit within the buffer portions of the EN will, within the buffer, retain $\geq 70\%$ of the naturally occurring mature and old forest structure (live trees, range of diameter classes, snags, coarse woody debris, tree species etc.) of the harvest unit measured either as basal area (m²) or forest area (hectares). No further harvesting may occur within the harvest unit (within the EN buffer area) until such time as the harvested portion has returned to a mature or older condition (ie. ICH 100 years, ESSF 120 years).

miscellaneous. The Cranberry SRMP addresses pine mushrooms, but recognizes that the collection of medicinal plants is also an important activity, particularly to the Gitanyow and Nisga'a citizens.

2.3.1.1 *Overview of Pine Mushrooms*

The pine mushroom (*Tricholoma magnivelare*) is a commercially important wild mushroom species that grows in coniferous forests throughout British Columbia, Oregon, Washington and northern California. British Columbia's wild mushroom industry was valued in 1999 at about \$25 to \$45 million dollars with an estimated annual harvest of 250 to 400 tonnes. The industry continues to be an important source of employment in many rural communities to this day. For these reasons, some forest managers are seeking ways to accommodate the pine mushroom resource in their forest stewardship plans.

The pine mushroom grows in association with the roots of a number of coniferous tree species, but is only found in certain appropriate forest types across its range. Identifying the extent and specific types of pine mushroom habitat across the forested landscape is an important step in understanding the resource. Sites known to be highly productive pine mushroom habitat were described in northwest British Columbia in 2001. Highly productive sites include areas where soils are well to very rapidly drained and are generally coarse in texture, often with a high coarse fragment content and a thin forest floor. Western hemlock is consistently the dominant tree species, with lodgepole pine also frequently present in the tree layer. Plant communities typically feature sparse herb and shrub layers with a high coverage of mosses. These attributes suggest pine mushrooms consistently occur on low-productivity forests typical of rocky ridges and hill tops, as well as on coarse textured soils near rivers.

Commercial pine mushroom habitat can be reliably identified through soil and vegetation characteristics, and the extent of this habitat can be estimated and mapped for strategic planning. Most mushroom habitat is quite small in extent and dispersed across the landscape. However, a few areas such as the Nass River - K'ali Aksim Lisims are unique because they contain a relatively high concentration of well-defined mushroom habitat within healthy mature forests.

A conflict exists between timber extraction and pine mushroom harvesting because both activities tend to take place in mature stands. After logging or natural disturbances such as forest fires, pine mushrooms will not re-establish for approximately seventy-five years. However, in some landscapes, the submesic¹⁹ ecosystems ideal for pine mushroom growth only have marginal economic value for timber because of lower wood volumes and smaller tree size. Partial cutting systems could allow for some timber removal while maintaining mushroom fruiting, and could be appropriate in some stands. Over the long-term, a combination of traditional stand harvest and extended rotation (e.g. 200 years) could be necessary to maintain a productive stock of pine mushrooms in mature forest stands.

There are uncertainties as to how economically valuable the pine mushroom will be the future. The market for pine mushrooms is entirely in Japan. Many countries, notably China, are now also exporting pine mushrooms to Japan in competition with Canada. In recent years, the prices for pine mushrooms in northwest B.C. have been reduced, down considerably from the lucrative values seen throughout the 1990's. It would seem unlikely that this resource will ever return to premium values again.

As the pine mushroom harvest is currently unregulated, the B.C. government derives little direct value from the harvest through taxes or royalties. The lack of regulation and rights, or tenure, to harvest pine mushrooms makes it difficult to develop and enforce the sector in a sustainable manner. Besides foregoing government revenue, lack of regulation for the harvest also creates problems of potential over-harvesting of the resource and potential infringement of aboriginal rights and traditional use of pine mushrooms.

¹⁹ For a definition of submesic, see "moisture regime" in the Cranberry SRMP glossary.

2.3.1.2 *Management Direction for Pine Mushrooms*

Plan Goal for Pine Mushrooms

Maintain pine mushrooms and provide opportunities for a sustainable harvest.

Objectives	Measures / Indicators	Targets
<p>1.0 <i>Maintain productive pine mushroom sites across the plan area</i></p>	<p>1.1 Percentage of productive pine mushroom sites²⁰ maintained in an age range from 80 to 200 years.²¹</p>	<p>not less than 50%</p>
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Pine mushrooms usually grow in forests with an age of 80 to 200 years. The intent is to have at least 50 percent of the productive area in an age range that can grow mushrooms, recognizing that mushrooms may not grow every year in a particular location. The entire age range does not have to be represented to achieve this target. • Best efforts are to be made to map all highly productive pine mushroom sites in the plan area. • Best efforts are to be made to research the effects of various harvesting and silvicultural regimes in the re-colonization and maintenance of productive pine mushroom sites. 	

2.4 Wildlife

2.4.1 Overview of Wildlife

The Cranberry SRMP area includes a range of ecosystems that support a wide diversity of wildlife species. Large mammals include grizzly and black bears, wolves, moose, mountain goats, and mule deer. A variety of birds inhabit the area, such as woodpeckers, hawks, owls, eagles, songbirds, grouse, and numerous species of waterfowl on a seasonal basis. Also resident are diverse small mammals, such as marten, vole, shrew, weasel, squirrel, fisher, wolverine and fox, as well as species of bats and amphibians.

The Nisga’a and Gitanyow traditionally utilized a wide range of wildlife for subsistence and cultural purposes, and continue to harvest numerous wildlife species today. The range of wildlife and their associated habitats must be sustained in order for the Gitanyow to continue to exercise their aboriginal rights. Wildlife habitats must also be maintained to help ensure healthy wildlife populations are capable of sustaining a hunter harvest by the Nisga’a, in accordance with the *Nisga’a Final Agreement*.

²⁰ “Productive pine mushroom” sites means those sites that can best produce pine mushrooms. i.e., sites that currently produce pine mushrooms and those sites undisturbed, previously logged or burned that can produce pine mushrooms. These sites are generally pine or hemlock leading stands below 800 m elevation in the following ecological site series: ICMmc1/01b, ICHmc2/01b, and CWHws2/03. The minimum size of area to be considered is 0.5 ha for homogenous site series and 1 ha for site series complexes.

²¹ If future research shows that silviculture systems (other than clearcut harvesting) can perpetuate pine mushroom production, the areas having these silviculture systems will contribute to meeting the target.

Hunting and wildlife viewing are also popular activities within the plan area. These activities overlap with the guiding territories of licensed guide outfitters.

With respect to wildlife, the intent of the Cranberry SRMP is:

- To maintain natural ecosystems and habitat to sustain viable populations of all indigenous wildlife species within their natural range;
- To sustain or enhance habitats of rare, endangered, threatened, and regionally significant species;
- To maintain and enhance habitat to help ensure wildlife populations are capable of sustaining a Nisga'a hunter harvest.
- To provide for Gitanyow continued use of wildlife resources;
- To maintain viable guiding and trapping industries;
- To provide for a sustainable harvest of big game species and furbearers; and
- To provide opportunities for viewing, studying, and appreciation of wildlife in their natural habitat.

2.4.1.1 *Moose*

The Cranberry SRMP area provides high value moose habitat, including important calving, rutting and winter habitat. The abundance and quality of winter habitats are key factors that influence over-winter survival of moose. The best habitats provide abundant accessible forage, coniferous canopies that intercept snow and act as thermal and security cover, large trees to help ward off predators, and opportunities for escape from predators. Winter range habitat is considered critical for moose populations in the plan area.

In this plan, moose habitat suitability and complexes serve as a proxy for moose winter range. It consists primarily of low elevation wetland-timber complexes, floodplains of main rivers and large tributary streams adjacent to coniferous stands. Forest harvesting and wildfire have resulted in some interim moose winter range by providing early seral forage in areas where mature/old forest canopy intercepts snowfall and thus reduces snow depths. Although harvested and burned sites can be important to moose in terms of temporary winter habitat, these areas have not been proposed for direct moose winter range management, except where they are embedded in the identified moose winter ranges.

The Nisga'a and Gitanyow depend on moose meat for sustenance and thus place a high value on moose habitat and moose population management. Moose meat is also highly valued by B.C. resident hunters who also place a high value on moose habitat and population management.

At the time of plan inception, moose numbers were believed to be well below carrying capacity within a balanced, natural predator-prey system. In 2007, an aerial survey of moose in and near the Nass Wildlife Area found that the moose population was at an unacceptably low level – likely as a result of over-harvesting by humans. New restrictions on moose harvesting, which encompassed hunting within the plan area, were put in place for the 2007 hunting season as a means of helping to restore the population to a higher level. The extent to which the population can be restored will depend largely on effective communications among the Ministry of Forests, Lands and Natural Resource Operations; NLG; Gitanyow; and stakeholders, as well as the extent of compliance with formal harvest allocations.

Road development within moose winter range has contributed to the decline of the moose population because it offers easy access for hunters using vehicles and snow machines. In addition to existing and future forest industry development, potential mineral, gas, and oil development, clean energy projects and roads, new access along the proposed Northwest Transmission Line (NTL), and roads to service the line will contribute to hunting pressure. Year-round access management will be important in ensuring a sustainable moose population capable of supporting an annual hunter harvest.

This plan supports official designation of moose winter range as Ungulate Winter Range under the *Forest and Range Practices Act*. General Wildlife Measures prescribed under the Ungulate Winter Range Order must be consistent with the direction of this plan.

2.4.1.2 *Management Direction for Moose*

Plan Goals for Moose

- Manage moose winter range to help ensure a healthy moose population.
- Minimize pressure on the moose population from legal and illegal harvest through human access management.

Objective	Measures / Indicators	Targets
1.0 <i>Maintain, enhance or restore the moose winter range habitats identified on Map 12: Moose Winter Range</i>	1.1 Number of subhygric to subhydric ²² sites, large enough to be considered a silvicultural treatable unit ²³ , where moose forage production is facilitated post timber harvest.	All
	1.2 Percent of mature + old forest canopy retained for snow interception in each winter range polygon with distribution weighted to natural forage area adjacency.	>30%
	1.3 Security cover ²⁴ within or adjacent to cut blocks must be provided.	80% of the security cover shall be separated by no greater than 200 metres

²² For definitions of “subhygric” and “subhydric”, see “moisture regime” in the Cranberry SRMP glossary.

²³ The minimum size for a treatable unit is:

- One hectare for pure subhygric to subhydric sites;
- Two hectares of noncontiguous subhygric to subhydric sites within ecosystem complexes where the individual sites are greater than 0.25 ha and such sites comprise 20% or more of the ecosystem complex area.

²⁴ Security Cover is defined as sufficient vegetation cover and/or terrain features that permit a moose to feel secure, comfortable and not threatened despite adjacent activities or predator movement that would otherwise displace the animal.

Objective	Measures / Indicators	Targets
	1.4 Percent of security cover retained directly adjacent to willow and red-osier dogwood complexes.	100%
	1.5 Amount of timber harvesting within willow and red-osier dogwood complexes.	None
	1.6 Percentage of the area of any given cutblock that is more than 100 m away from adjacent mature forest cover for snow interception.	<20%
<p>Management Considerations</p> <ul style="list-style-type: none"> • Mapping of specific forage areas has not been completed for the plan area. Priority should be placed on completing this inventory. • In this plan, moose habitat suitability of high and moderate ranks serve as a proxy for moose winter range. • When specific forage areas are mapped, a measure/indicator should be developed to determine the percentage of mature forest to be retained for thermal cover. • Within identified moose winter range, harvest using silviculture systems, block configurations, patch sizing and patch distribution that will provide forage, visual screening, thermal and security cover, and snow interception while integrating timber and silvicultural management objectives. • Emphasis for thermal cover, snow interception and security cover management is adjacent to moderate and high value identified forage areas. A forested buffer of 50 to 100 m wide is recommended, depending on topography. Also recommended that forest types be retained adjacent to moderate, high and very high value mapped forage areas. • Moose forage production can be facilitated post timber harvest by promoting gap openings through reduced stocking standards, cluster planting, spacing and pruning at the silvicultural treatment unit level. • Develop General Wildlife Measures for managing moose winter range through Ungulate Winter Range designation under <i>FRPA</i>. • Moose winter range management plans to be prepared for winter ranges that are subject to forest development, where funding is available. These plans should include a monitoring component to ensure adaptive management can correct any errors, should they be found, in moose winter range placement or the management regime. • Refer to Appendix B: Moose Habitat Attributes for Life Requisites and Appendix C: Best Management Practices for Moose Winter Range for supporting information. 		

Objective	Measures / Indicators	Targets
<p>2.0 <i>Through access management, minimize mortality and disturbance to moose within and adjacent to the moose winter ranges identified on Map 12: Moose Winter Range</i></p>	<p>2.1 Number of roads, excluding mainlines, within 500 metres of a moose winter range, where access is controlled following achievement of regeneration delay²⁵ to effectively reduce motorized accessibility to the winter range.</p>	All
	<p>2.2 Number of roads within moose winter range to be deactivated, or have motorized vehicle access restricted following achievement of regeneration delay or within 1 year if roads are inactive.</p>	All
	<p>2.3 Number of roads and right-of-ways of industries other than the forest industry, within 500 metres of Moose Winter Range, where access is controlled to effectively reduce motorized accessibility to the winter range.</p>	All
	<p>2.4 Number of proposed non-forestry developments that have prepared access management plans prior to initiating any development construction, as an integral part of their license for occupation and operation.</p>	All
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Access control includes road deactivation, restrictions that attempt to prevent access by 4WD and off-road vehicles, and legislative authorities for vehicle closure. • Within a moose winter range, primary forest activities to focus within a short time frame, followed by a long phase of inactivity to reduce access related impacts to wintering moose. • Moose winter range management plans should address both the risk of disturbance and methods for limiting access to moose winter ranges during their wintering period (November 1 to May 1). • Moose winter range management plans should be prepared by all non-forestry industries that plan developments within the plan area, prior to any development clearing or construction activities, as a condition to receiving a license or permit from the Province of B.C. to proceed with the project. 	

2.4.1.3 *Mountain Goat*

Approximately 60 to 70 percent of North America’s (global) population of mountain goats are found in B.C. The B.C. population of mountain goats is roughly estimated at 35 000 to 63 000 goats, of which approximately 16 000 to 35 000 reside within the Skeena Region. The mountain goat population has not

²⁵ For a definition of Regeneration Delay, see Cranberry SRMP Glossary.

been specifically estimated for the Cranberry SRMP area given respective populations are managed on a Wildlife Management Unit basis.

In B.C., the mountain goat is yellow-listed, a classification indicating that the species' welfare is not of immediate conservation concern. However, with a provincial ranking of S4²⁶, populations are considered to be of long-term conservation concern. Mountain goats have low reproductive rates and are vulnerable to hunting mortality which can increase as a result of new access.

Within the SRMP area, most mountain goats utilize old forests on steep south- to west-facing slopes for winter range, generally within a few hundred metres of escape terrain. High- and moderate-value goat winter habitat is present at localized canyon and escarpment sites and throughout the mountains of the plan area. Most goat wintering sites are within areas considered to be inoperable for timber harvesting at this time. See **Map 13: Mountain Goat Winter Range**.

The Cranberry SRMP area provides important habitat for mountain goat. The abundance and quality of winter habitats are key factors that influence over-winter survival of goats. The best habitats provide abundant accessible forage, coniferous canopies that intercept snow and act as thermal and security cover, and opportunities for escape or defence against predators. Winter range habitat is considered critical for mountain goat populations in the plan area. Summer habitat for goats mostly consists of alpine ridges and alpine meadows with nearby cliffs that provide escape terrain.

Within the plan area, mountain goats use alpine habitats in summer, and usually winter in subalpine and subalpine parkland areas nearby, primarily on southerly aspects. They can, however, be forced to winter in forested sites right to the valley bottom in coastal areas due to the heavy wet snows that cling to cliffs and bury food supplies. Mountain goats will remain in, or occasionally return to, alpine locations during winter if wind-scouring or minimal snow depth permits foraging in these locations.

The specific diet chosen by goats is dictated by what is available locally. Winter diets in interior areas are predominantly grasses, sedges and subalpine fir. In coastal areas, their diets consist predominantly of woody browse. Arboreal lichens are consumed when available. Summer diets vary, but usually include a mixture of succulent herbs, newly growing grass and sedges, and woody browse.

The use of helicopters in commercial recreation must be carefully regulated and monitored given the disturbance risk to mountain goats. Adherence to the *Wildlife Guidelines for Backcountry Tourism/Commercial Recreation in British Columbia* will largely address concerns associated with mountain goat disturbance in their winter ranges. For a copy of the guidelines, see http://www.for.gov.bc.ca/mof/orv/wildlife_guidelines.pdf. Heli-logging is also addressed within this section of the Cranberry SRMP.

Since an Ungulate Winter Range (UWR) Order U-6-006 was established under the *Forest and Range Practices Act* in 2007, this plan will not establish resource management objectives for mountain goat as a UWR. The UWR Order is available at: http://www.env.gov.bc.ca/wld/documents/uwr/uwr_u6_006.pdf, while the exemption process can be found at: <http://www.env.gov.bc.ca/wld/frpa/index.html>. The map corresponding to the UWR Order U-6-006 is available at: http://www.env.gov.bc.ca/esd/distdata/ecosystems/frpa/uwr/r6/tuwra_u-6-006.zip.

General Wildlife Measures prescribed under the UWR Order must be consistent with the direction of this plan. Since this plan addresses the need to increase the disturbance buffer surrounding canyon-dwelling mountain goat winter range to 1 000 metres, a specific resource management objective has been added to reflect this need. As such, the UWR order will need to be amended.

²⁶ The S-series ranking is a numeric rank of relative imperilment applied at the provincial scale, based on the conservation status ranking system developed by NatureServe.

2.4.1.4 *Management Direction for Mountain Goat*

Plan Goals for Mountain Goat

- Manage mountain goat winter range to help ensure a healthy mountain goat population.
- Avoid disturbance and displacement of mountain goats during vulnerable periods.
- Minimize pressure on the mountain goat population from legal and illegal harvest through human access management.

Objectives	Measures / Indicators	Targets
<i>1.0 Minimize the number of roads within 500 m of mountain goat winter range and 1 000 m of canyon-dwelling goat winter range</i>	1.1 Percentage of roads within 500 m of mountain goat winter range and roads within 1 000 m of canyon-dwelling mountain goat winter range that have not been exempted, deactivated within one year following the completion of industrial activities.	100%
	1.2 Percentage of existing roads within 500 m of mountain goat winter range and 1 000 m of canyon dwelling mountain goat winter range that are deactivated or managed to mitigate adverse disturbance.	100%

Objectives	Measures / Indicators	Targets
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Access roads within 500 m of mountain goat winter range and 1 000 m of canyon-dwelling mountain goat winter range are to be constructed in a manner that facilitates effective deactivation. • Where no practicable alternatives to building roads within these buffer areas exist, roads and trails should employ strategies to protect goats and their habitats from disturbance. These strategies may include: <ul style="list-style-type: none"> • placing adequate timber buffers around mountain goat winter ranges; • locating roads and trails no closer to mountain goat winter range than made necessary by operational site constraints; or • other suitable techniques. • When demonstrated by a qualified professional wildlife biologist that there is a low level of risk to goats, exemptions may be considered for: <ul style="list-style-type: none"> • construction of roads or trails in mountain goat winter range where no other access options exist; • construction of semi-permanent mainline roads within 500 m of mountain goat winter range to access timber beyond a specific mountain goat winter range; and • Existing roads and trails within 500 m of a mountain goat winter range, and within 1 000 m of canyon dwelling/escarpment goat winter range, should be assessed for disturbance risk to mountain goat populations. Mitigation plans should be developed accordingly. • Where road access has a potential impact on identified mountain goats, a risk assessment should be conducted and appropriate measures be taken to help ensure population viability. 	
<p>2.0 Minimize adverse disturbance to mountain goat winter range from helicopter logging activities</p>	<p>2.1 Percentage of helicopter logging occurring within 2 000 metre line of sight of a mountain goat winter range, that have not been exempted, that takes place between November 1 and June 15.</p>	<p>0 %</p>

2.4.1.5 *Grizzly Bear*

The plan area contains high value habitat for grizzly bears. These habitats are generally defined as herb-dominated avalanche tracks, subalpine parkland meadows, herbaceous riparian meadows, wetland complexes, ecosystem networks, rich water-receiving forest sites and skunk cabbage associations.²⁷ Forested buffers surrounding these sites are important habitat components that contribute to thermal and security cover for grizzly bears. Forested buffers also protect high use grizzly trails and bedding sites. In addition, territorial markings and other forms of bear to bear communication commonly occurs along high use trails adjacent to foraging areas.

²⁷ It is important to note that rich water-receiving forest sites and skunk cabbage associations are not commonly identified through aerial photo interpretation, and may not be captured by the current state of high value grizzly bear habitat mapping.

Salmon fishing sites and early seral forests associated with either natural burns or timber harvesting play an important role in grizzly bear food availability. Fish and berries from these sites help build body fat for successful denning. Kispiox, Nangeese, and portions of Weber Creek watersheds are ranked as provincially significant for grizzly bear habitat values, due in large part to the salmon runs here. Extensive patches of huckleberry throughout the plan area are also a key food source for grizzly bears, as are devil’s club berries, although to a lesser extent. Moose calves are likely to be important food items as well.

During their planning and operations, forest licensees may discover high value grizzly bear habitats in addition to those currently identified through the Specified Area process. Rich water-receiving forest sites and skunk cabbage associations, for example, are not commonly identified through aerial photo interpretation and may not be captured in the current mapping. In such cases, forest licensees are encouraged to utilize the services of experienced habitat biologists to determine the value of these additional habitats and develop measures to maintain their quality and effectiveness for grizzly bears.

In forested settings, early seral and old growth stands provide optimal foraging for grizzly bears. Mid-seral forests, especially stands managed for rotational forestry, tend to have minimal forage value. The availability of forage plants in early seral forests can be prolonged in managed stands through the use of wet site patch retention and silvicultural techniques such as cluster planting, variable density stocking, spacing, pruning and thinning. In addition, the designation of Old Growth Management Areas and hydro-riparian ecosystem networks will contribute to old growth retention across landscapes, and thus the availability of grizzly bear forage.

Besides managing for high value habitats and forage species, resource managers must focus on the threats to grizzlies that arise from road development and the associated increased human access that leads to the erosion of wilderness (bear refuge). This, along with the negative habituation of bears to humans that tends to happen when they are in close association with each other, ultimately results in an increase in bear mortality and displacement. Population extinction and extirpation of grizzly bears is a disturbing trend that continues today throughout North America. Given this, the Cranberry SRMP area watersheds will become more important to future generations of grizzly bears and humans as one of the last places where both species can continue to co-exist successfully.

This plan supports official designation of Grizzly Bear Specified Areas under the *Forest and Range Practices Act*. General Wildlife Measures prescribed under the Specified Area Order must be consistent with the direction of this plan. Note that “Specified Areas” is replacing “Wildlife Habitat Areas” for grizzly bear management.

2.4.1.6 *Management Direction for Grizzly Bear*

Plan Goal for Grizzly Bear

Provide adequate grizzly bear habitat to help ensure a healthy population of grizzly bears.

Objectives	Measures / Indicators	Targets
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Objectives	Measures / Indicators	Targets
<p>1.0 Preserve the highest value grizzly bear habitat, identified on Map 14: Grizzly Bear Habitat Complexes</p> <ul style="list-style-type: none"> • Class 1: Very High; provincially significant value • Class 2: High value 	<p>1.1 Within 100 m of critical habitat types²⁸ occurring within Grizzly Bear Habitat Complexes identified on Map 14, proportion of the forested area of each polygon identified and retained as functional thermal or security cover in mature and old growth condition, except for the following cases:</p> <ul style="list-style-type: none"> • access; • operational safety considerations; or • to minimize impacts on adjacent environmental values. <p>Management Considerations</p> <ul style="list-style-type: none"> • Specified Areas have not yet been mapped for the Cranberry SRMP area. When mapped, they will capture bedding and forage areas as well as provide thermal and security cover and will not exceed 3.86% additional timber harvesting land base impact outside of already constrained areas (3.86% is the proportional impact of THLB) from the Nass South SRMP). • High use grizzly trails should be mapped and managed to maintain their integrity for travel and communication. • Following the establishment of Specified Areas, where harvesting operations may occur within and adjacent to the mapped Grizzly Bear Habitat Complexes, considerations include the following Best Management Practices: <ul style="list-style-type: none"> ▪ Selection and small patch cut systems that create canopy gaps and openings <10 ha, and generally <5 ha. ▪ Cutting unit opening sizes that reflect the adjacent habitat values and are smaller than 2 ha immediately adjacent to the highest value habitat, and larger in lower valued habitat. ▪ Variable levels of retention (e.g. 10 to 30+ %) that minimize line of sight distance and maximize patch heterogeneity. ▪ Concentrated development followed by prompt silviculture and deactivation to minimize the length of operation within a GBHC. ▪ Timing of operations within or adjacent to the GBHC preferably during winter or during times of low or no use by bears. 	<p>100%</p>

²⁸ Critical habitat types include Sitka alder-spiny wood fern seepage sites; south aspect Trembling aspen-Douglas maple sites (minimum 5% cover of Douglas maple); Sitka alder-cow parsnip avalanche chutes; Spruce-black twinberry floodplain (ICHmc2/05); trembling aspen-beaked hazelnut sites (ICHmc2/51); paper birch-red osier dogwood fans (ICHmc2/03); south aspect Paper birch-falsebox sites; black cottonwood-red osier dogwood floodplains (CWHws2/08); Spruce-Salmonberry floodplains (CWHws2/07); Cottonwood-Willow Floodplains (CWHws2/09); thimbleberry-cow parsnip moist meadows; willow swamps and willow-sedge wetlands (where willow is the dominant woody vegetation and exceeds 20% cover); Skunk cabbage sites (CWHws2/11; ICHmc2/07; ICHmc1/06).

Objectives	Measures / Indicators	Targets
<p>2.0 <i>Maintain the quality and effectiveness of grizzly bear foraging habitat</i></p>	<p>2.1 Proportion of foraging habitat listed in Table 10. High Value Grizzly Bear Habitat in the Cranberry SRMP Area, occupying greater than 1 ha within a cutblock, that maintains herbaceous and woody forage supply for grizzly bears through to stand rotation, as assessed at the achievement of free-growing status for regenerated stands.</p>	<p>100%</p>
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Vegetation management practices, within high value grizzly bear forage habitat to maximize retention of valuable forage species. Practices may include: <ul style="list-style-type: none"> • reduced stocking standards in wetter or richer sites, targeting up to 600 stems/ha at free-to-grow or • pruning, spacing or thinning. 	
	<p>2.2 Proportion of non-forested forage areas greater than 2 ha in size, identified in Table 10. High Value Grizzly Bear Habitat in the Cranberry SRMP Area, with directly adjacent functional thermal and security cover.</p>	<p>100%</p>
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Adjacent areas should be approximately 100 metres in width and fully surround the forage area where possible. • Thermal cover includes habitat conditions that afford for a dry place when it is cool and wet, and a cool place when it is hot and dry; these conditions are generally provided in old-growth settings utilizing full canopy mature and veteran trees. • Security cover provides visual screening, especially from roads, and exists when vegetation obscures a person’s view of a grizzly bear. • High-use grizzly bear trails should be mapped and managed to maintain their integrity for travel and communication. 	
<p>3.0 <i>Minimize human-bear conflicts</i></p>	<p>3.1 Proportion of grizzly bears killed or relocated as a result of human-bear conflicts.</p>	<p>Reduction</p>

Objectives	Measures / Indicators	Targets
	<p>Management Considerations</p> <ul style="list-style-type: none"> For expert resources on minimizing bear-human conflict, see Appendix D: Minimizing Human-Bear Conflicts. Until replaced by alternative programs, use BMP's as described by the provincial Conservation Officer Service and the B.C. Conservation Foundation Bear Aware program http://www.bearaware.bc.ca/ Proponents of industrial development should account for impacts to grizzly bear habitat and the potential interactions between humans and grizzly bear. This SRMP supports continuation of the provincial Bear Aware program, or similar efforts to increase public awareness of bear-human interactions and reduce bear mortalities. It is recognized that grizzly bear mortality cannot be eliminated entirely in areas heavily developed for settlement or agriculture, and that grizzly bears attracted by habitat or human-provided food are likely to be killed as a result of conflicts with humans. 	
<p>4.0 <i>Minimize long-term displacement of grizzly bears from industrial access development</i></p>	<p>4.1 Minimum distance of permanent roads from high value grizzly bear habitat identified on Map 14: Grizzly Bear Habitat Complexes.</p>	<p>150 m (where practicable)</p>
	<p>Management Considerations</p> <ul style="list-style-type: none"> Access restrictions could be used to minimize roaded motorized access within selected portions of grizzly bear winter habitat areas for periods of time. This can be achieved through the identification and use of control points, where access restrictions such as bridge removal or gating can be employed. Industrial development within or adjacent to valuable grizzly bear habitat should be planned for short periods of time, followed by long periods (10 to 25 years) of no development. 	

Table 10. High Value Grizzly Bear Habitat in the Cranberry SRMP Area

BEC variant	Site Series	Site Series Name
CWH ws2	05	HwBa - Queen's cup
CWH ws2	06	BaCw - Devil's club
CWH ws2	07	Ss - Salmonberry
CWH ws2	08	Act - Red-osier dogwood
CWH ws2	09	Act - Willow
CWH ws2	10	PI - Sphagnum
CWH ws2	11	CwSs - Skunk cabbage
ESSF wv	06	Bl - Devil's club - Lady fern
ESSF wv	07	Bl - Valerian - Sickle moss

ESSF wv	08	Bl - Horsetail - Glow moss
ESSF wv	09	Bl - Lady fern - Horsetail
ICH mc1	04	HwBl - Devil's club
ICH mc1	05	ActSx - Dogwood
ICH mc1	06	Hw- Azalea - skunk cabbage
ICH mc2	03	HwCw-Oak fern/EP-Red-osier dogwood fans
ICH mc2	05	Sx – Devil's club- Lady fern/Sx – Black twinberry floodplain
ICH mc2	51	At – Beaked hazelnut
ICH mc2	07	CwSx – Horsetail – skunk cabbage
	Non-forested	Sitka alder – Spiny wood fern (seepage sites)*
	Non-forested	South aspect At-Douglas maple ($\geq 5\%$) sites*
	Non-forested	Sitka alder – Cow parsnip avalanche chutes*
	Non-forested	Thimbleberry – Cow parsnip moist meadows*
	Non-forested	Willow swamps and willow-sedge wetlands (willow dominant, $\geq 20\%$ cover)*
MH mm2	08	HmYe – Sphagnum
MH mm2	09	YeHm – Skunk cabbage

* - Site complex is found across a range of BEC variants.

Note: CWHws2 04 is excluded from Table 10. In situations where competing vegetation (silviculturally) that is considered to be grizzly bear forage makes achievement of a target stocking standard difficult, reduced stocking standards should be acceptable to prevent aggressive control of such competing vegetation. CWHws2 04 is a blue listed ecosystem.

2.4.1.7 *Fur-bearers*

A number of fur bearers reside within the plan area including marten, fisher, wolverine, ermine (weasel), mink, lynx, fox, coyote, wolf, muskrat and beaver. Historic trapping of these species has been more intense than that of the present day, but many traplines continue to be held in high regard.

Healthy populations of fur bearers are reflective of healthy, functional landscapes. Species such as marten, fisher and wolverine are often referred to as indicator species – if their populations are viable, then generally the ecosystems in which they reside are biologically functional.

Marten are the most abundant of the three indicator fur bearer species with noted population fluxes depending on food supplies. Marten are highly reliant on the presence of coarse woody debris protruding from the snow to permit access to the forest floor in their pursuit of prey. They are also dependent on good forest structure for a variety of life requisites as well as undisturbed meadow complexes in their pursuit of voles. Although marten are generally found in and among forests, they will venture into natural burns provided standing and fallen forest structure remains on site. Clearcutting without consideration of stand structure retention, recruitment or debris pile management effectively eliminates marten habitat suitability well beyond the timelines of rotational forestry. Stand level considerations are essential in maintaining marten habitat within developed landscapes.

Fisher is a relatively rare animal and is a blue-listed (vulnerable) species in British Columbia. It is also listed under B.C.'s *Identified Wildlife Management Strategy Version 2004*²⁹ as a species requiring additional or specific management to sustain viable populations. Within the plan area, its relative rarity is more associated with its natural population distribution than as a result of habitat alteration. However, as landscapes become developed through road development, forest harvesting and other industrial activities, fisher numbers will likely decline. Fishers can be found from valley bottom to near treeline in search of their prey (most notably porcupine), although they generally reside in riparian habitats and dense forests containing decadent trees with cavities. These animals avoid larger openings due to their exposure and vulnerability to predators on these sites. The long-term threat to fisher population sustainability is loss of forested habitat with suitable structure. A secondary threat to fishers is direct mortality associated with their vulnerability to trapping.

Wolverine is a blue-listed (vulnerable) species in British Columbia. Like fisher, the wolverine is listed under the Identified Wildlife Management Strategy. Wolverines are vulnerable to trapping due to their scavenging and predatory nature. The species is also subject to a low reproductive rate and is easily disturbed in late winter when the females are in their dens with their new-born kits. These factors impact the viability of the wolverine population. Much like grizzly bears, wolverines require large areas with limited resource development to sustain viable populations. Areas considered refugia with adequate dispersal and connectivity among landscapes are crucial. In part, the management of grizzly bears will contribute, by default, to the management of wolverines from a landscape perspective.

The focus for fur bearer management within this plan has been on the broader scale known as the coarse filter biodiversity level, whereby managing for biodiversity will contribute to the maintenance of fur bearers. Biodiversity objectives in this plan will augment current management for marten, fisher, wolverine, ermine (weasel), mink, lynx, fox, coyote, wolf, muskrat and beaver. Specific management measures have been developed for vulnerable species, notably fisher and wolverine. To support on-the-ground application of management measures, this plan has recommended habitat suitability and capability mapping for fisher and wolverine.

2.4.1.8 Management Direction for Fur-bearers

Plan Goal for Fur-bearers

- Maintain high value habitat for identified fur-bearer species to help ensure a healthy population of fur-bearers.

Objective	Measures / Indicators	Targets
<i>1.0 Minimize impact to known high value fisher and wolverine habitat</i>	1.1 Percentage of known fisher and wolverine denning sites impacted by industrial development.	0%
	Management Considerations <ul style="list-style-type: none"> • Habitat capability/suitability mapping should be completed concurrently for fisher and wolverine. 	

²⁹ Strategy is available online at <http://www.env.gov.bc.ca/wld/frpa/iwms/iwms.html>

Objective	Measures / Indicators	Targets
	<ul style="list-style-type: none"> • Fisher denning habitats are currently identified as large veteran cottonwood trees which tend to grow on floodplains, but not exclusively. • Develop BMP's for managing fisher and wolverine habitat. • Achievement of biodiversity objectives listed in Section 2.2.2 will contribute to the maintenance of fur-bearer habitat throughout the plan area. • Minimizing the duration of active roads and their conduciveness for human use, in proximity to mountains in the ESSF and MH BGC zones, will reduce risk to wolverine den site disturbance. 	

2.4.1.9 *Northern Goshawk*

The northern goshawk is a forest raptor that is presently yellow-listed in British Columbia. Yellow-listed species are not considered at risk of extinction, but are noted because they warrant special attention by wildlife and resource managers. The northern goshawk has been placed on this list due to the loss of nesting/post fledging areas and alteration of habitat as a result of clear-cut timber harvesting. As an indicator of forest ecosystem health, goshawk occupancy tends to signal a functional natural landscape.

Goshawks are primarily adapted to forest habitats and typically nest in mature to old growth coniferous stands that are even-aged and have a closed canopy with an open understory. Their breeding territory consists of three components: nest area, post fledging area and foraging area. The nest area usually includes multiple nest sites, plucking perches and roosts and is the center of activity for newly fledged young. Once established, goshawks exhibit a very strong attachment to nest areas, and often use them intermittently for many years. Studies to date suggest that goshawk young stay relatively close to the nest site during their initial post-fledging period. These studies recommend a post-fledging area designation of approximately 24 hectares and note the strong defensive behaviour exhibited by the parents. Nest sites, nest areas and post fledging areas are critical habitat components for the sustainability of goshawks. Protection and maintenance of these areas is a priority for goshawk conservation. As such, OGMA's will be relocated through the OGMA Amendment Process to protect goshawk nest areas and post fledging areas as they are found.

Evidence suggests that goshawks strongly prefer mature forests for foraging habitat. What is unclear is the adaptability of goshawks to habitat alteration in these areas given current forestry operations. Due to uncertainty around the amount and quality of foraging habitat needed to support successful fledging of young goshawks, this plan has not set measures and targets to address the proportion of a foraging area that should be retained in mature to old age classes. Goshawk inventories and research within the plan area are needed to fully understand the life requirements of the species. Priority has been placed on the collection of this information. As knowledge is developed on the subject, it will be important to revisit this section to further define and manage goshawk habitat for the benefit of the species. A 1:20 000 scale paper map of goshawk habitat suitability does exist and can be made available digitally if required.

Studies have shown that goshawk pairs are relatively evenly distributed within forest dominated landscapes with the distance between territories primarily driven by prey availability. Nests are, on average, four to five kilometres apart. Proportionately, prey kills are made more frequently in the largest patches of suitable foraging habitat closest to the nest, with most of the prey brought back to the nest within a two to three kilometre distance. The northern goshawk is likely a year-round resident most years within the Cranberry SRMP area. Breeding success is strongly linked to the over winter body condition of the female, who is dependent on the quality of foraging habitat surrounding the nest. To help ensure breeding success, attention must be given to the availability and quality of this habitat. Although the

science is not exact, it is desirable to have forty to sixty per cent of the foraging area in mature to old age classes; this prescription is not too dissimilar from marten habitat management.

Northern goshawks are noted to prey on squirrels, grouse, thrush sized birds and woodpeckers, among other species. They utilize perch trees from which they launch ambush attacks on prey. They are also noted to hunt prey in second growth forests using the edge of mature to old stands, thus demonstrating some level of adaptability provided there is sufficient mature and old forest to support most of their life requisites.

The goshawk population residing within the plan area is noted to have been negatively impacted as a result of past timber harvesting. Restoration of these habitats is described within this section of the plan.

Nest monitoring of known nest sites in the Cranberry and Kispiox watersheds over the past 13 years indicates a declining number of active territories. See **Map 15: Goshawk Nest Locations**. Similar trends are occurring elsewhere. It appears that timber harvesting is not the only mechanism affecting breeding success. Climate change, resulting in higher precipitation causing lower prey abundance, and increased black fly activity resulting from higher spring and summer temperatures, may be the cause of reduced breeding success and a decline in goshawk nest re-occupancy.

In the context of this changing climate, one way to mitigate these impacts is to ensure that the environment (habitat and prey) that goshawks are living in presently is not further stressed by forest management practices. Specifically, this means that practices that do not work toward a minimum threshold of habitat requirement but develop forest stewardship practices that provide abundant suitable habitat and prey (Frank Doyle; *Goshawk Nest Monitoring in the Cranberry and Kispiox Watersheds*, 2008).

Best Management Practices are to provide direction that allow for restoration of goshawk habitat (e.g. longer rotation lengths to develop structure, stocking standards and spacing, and future harvesting systems such as intermediate cutting and small patches). Restoration of compromised goshawk habitat will require identification of location and extent of goshawk habitat that has been negatively impacted by harvesting. Targets are also needed for the conservation of future goshawk habitat.

2.4.1.10 *Management Direction for Northern Goshawk*

Plan Goal for Northern Goshawk

Maintain a viable population of northern goshawk within the plan area.

Objective	Measures / Indicators	Targets
1.0 <i>Maintain nesting and post-fledging habitat at known goshawk nest areas, to support continued use and reproduction</i>	1.1 Number of known goshawk nest and post-fledging areas retained.	All
	1.2 Amount of mechanized activity ³⁰ within 500 m of active goshawk nest(s) between February 15 and August 15.	No activity
	1.3 Amount of human activity ³¹ within 200 m of	No activity (unless

³⁰ Mechanized activity is road construction and timber harvesting/mechanized silviculture activities.

Objective	Measures / Indicators	Targets
<i>in those areas</i>	active goshawk nest(s) between February 15 and August 15.	no practicable alternative exists)
	<p>Management Considerations</p> <ul style="list-style-type: none"> • The nest and post-fledging area is approximately 24 ha. This area is generally large enough to include the buffer, the distribution of alternative nests, roosts, plucking perches and juvenile post-fledging area movement. • The shape and boundaries of nest and post-fledging areas should be ecologically based to maximize the value of the area, to maintain nest area occupancy and breeding success. Where multiple nests occur, the nest- and post-fledging area should maximize the amount of high-quality nest-area habitat included within it (e.g. generally Hw leading, age class ≥ 8, canopy closure class ≥ 5, open understory). • A qualified professional should be notified immediately upon discovery of a goshawk or active nest. It will be the responsibility of the qualified professional to determine the size and configuration of the nest- and post-fledging area and adjacent habitat connectivity, in consultation with the respective forest licensee. • If mechanized activity must occur within 500 m of an active goshawk nest between February 15 and August 15, forest licensees are requested to notify the Ministry of Forests, Lands and Natural Resource Operations so that goshawk activity can be monitored. • Habitat capability/suitability mapping should be completed for goshawk, using provincially approved standards. • A concerted effort should be undertaken to identify active nest-post fledging areas to assist in the spatial identification of territories and implementation of plan direction. • See Map 15: Goshawk Nest Locations 	
2.0 <i>Maintain foraging habitat³² around known goshawk nest and post-fledging areas</i>	2.1 Proportion of perimeter of nest and post-fledging area that is directly connected by mature or old forest to comparable forest in the foraging area.	Minimum of 30%
	<p>Management Considerations</p> <ul style="list-style-type: none"> • See Map 15: Goshawk Nest Locations, for currently known nest locations. • Upon locating a goshawk nest or post fledging area, a sensitivity analysis should be conducted of the forage area, as best as it can be defined. The analysis should be in the form of a risk assessment with respect to: <ul style="list-style-type: none"> ◦ percentage of mature and old forests; 	

³¹ Human activity includes log hauling and those activities not identified as mechanized activity.

³² Goshawk forage habitat is defined as the hunting territory typically used by a pair of goshawks.

Objective	Measures / Indicators	Targets
	<ul style="list-style-type: none"> ○ degree of forest fragmentation; and ○ other considerations that may be impacting utilization of available habitat supply. • Where practicable, forest licensees should plan operations to minimize loss of habitat supply within active forage areas, utilizing current science. 	
	<p>2.2 Mature and old forest structure and function retained within determined foraging area around goshawk nests and post-fledging areas.</p>	<p>≥ 60%</p>

2.4.1.11 General Wildlife

Numerous high value habitats have been identified throughout the plan area for species of management concern. These valuable habitats, although proposed for specific species, also provide significant value for wildlife in general.

Several additional areas of habitat have been identified for general wildlife, centered on wetland and riparian features which are “hot spots” of biodiversity and wildlife activity. Relative to their size, wetland and riparian habitats tend to have a disproportionately higher value for general wildlife than the surrounding forest matrix, and are used by a variety of amphibians, birds and mammals. These areas also serve as biological anchors throughout the landscape.

Management intent is to protect these special wetland and riparian habitats for general wildlife. Protection of these habitats will, in part, also benefit some species of management concern. Additional high value habitats for general wildlife may be identified in the future, and it is expected that these will also be managed to retain values for general wildlife.

2.4.1.12 Management Direction for General Wildlife

Plan Goal for General Wildlife

- Protect special habitats for general wildlife

Objectives	Measures/Indicators	Targets
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Objectives	Measures/Indicators	Targets
<p>1.0 Maintain effectiveness³³ of riparian habitats adjacent to wetlands in polygons identified on Map 16: <i>Special Habitats for General Wildlife</i></p>	<p>1.1 Proportion of the forested area of the hydroriparian zone³⁴ retained for each identified feature, except where no practicable alternative exists to:</p> <ul style="list-style-type: none"> • build roads or trails. • access or harvest timber that is outside the hydroriparian zone. • mitigate a safety concern. • negate impacts on adjacent forest values from a compelling forest health issue. 	<p>100%</p>
<p>2.0 Maintain effectiveness of alder brush and aspen patch habitats in polygons identified on Map 16: <i>Special Habitats for General Wildlife</i></p>	<p>2.1 Width of the retained forested area surrounding each identified feature, except where no practicable alternative exists to:</p> <ul style="list-style-type: none"> • build roads or trails. • access or harvest timber that is outside the retained forest area. • mitigate a safety concern. • negate impacts on adjacent forest values from a compelling forest health issue. 	<p>≥50 metres</p>

2.5 Fisheries

2.5.1 Overview of Fisheries Resources

The Kitwanga, Cranberry, Kispiox, Nangeese, Kiteen rivers and their tributary streams have fisheries values ranked high to very high. The main stem river and tributary streams support runs of anadromous fish, including Steelhead, Chinook, Sockeye, Chum, Pink, and Coho salmon, as well as Cutthroat trout, Rainbow trout, Dolly Varden char, Bull trout, Rocky Mountain whitefish, and various species of coarse fish.

The fish stocks of the planning area have traditionally been and currently are very important to the Gitanyow and Nisga’a people as a staple source of food. In addition, the *Nisga’a Final Agreement* provides for annual allocations of salmon and steelhead to Nisga’a citizens. The fish stocks are also important to commercial and recreational fisheries.

Management intent is to maintain or increase wild indigenous fish populations, with emphasis on salmon, summer-run steelhead, bull trout and dolly varden; to preserve, maintain and restore fish habitat; to protect sensitive fish populations and habitat; and to provide for sustenance, recreational and commercial use, and tourism opportunities of the fisheries.

2.5.1.1 Salmon

As a “keystone” species, salmon bring valuable marine nutrients inland to feed a multitude of flora and fauna throughout the Cranberry SRMP watersheds, contributing to rich, diverse and healthy ecosystems. Annual salmon migrations are regarded as one of the important nutrient and life-energy flows that occur

³³ “Effectiveness” means the continued use of a habitat by the species that historically utilized it.

³⁴ Hydroriparian zone as defined in item 4 of Table 8. Rationale for Amending the Ecosystem Network.

within the watersheds. The interconnectedness of salmonids, their habitat, and the surrounding landscape is well established. Salmon help support viable populations of trout and char species, smaller fish and an array of benthic organisms. Abundant salmon in the Kitwanga, Kispiox, Nangeese, and Cranberry rivers also help support a population of grizzly bears.

Sockeye, in addition to the other Pacific salmon and steelhead species in the watershed, are extremely important to the Gitanyow and Nisga'a citizens who fish in the area for food, social and ceremonial purposes. The *Nisga'a Final Agreement* provides for annual allocations of salmon and steelhead to Nisga'a citizens.

Management for salmon is to be consistent with the intent of the Wild Salmon Policy³⁵ and the *Nisga'a Final Agreement*. The Wild Salmon Policy is founded on six commitments including: safeguarding the genetic diversity of wild salmon populations; maintaining habitat and ecosystem integrity; managing fisheries for sustainable benefits; making decisions through open and accountable public processes; ensuring accountable management and evaluation of progress; and forging partnerships with First Nations and stakeholders.

2.5.1.2 ***Bull Trout***

Bull trout are resident fish that inhabit watersheds within the plan area. They are a key predator in the aquatic food chain and a valuable seasonal food fish to the Gitanyow and Nisga'a. Bull trout are also important sport and food fish to B.C. residents.

Bull trout are classified by the Conservation Data Centre of B.C. as a blue-listed (vulnerable) species due to population decline throughout its global range. The decline is attributed primarily to habitat degradation, disruption of migratory patterns and over-fishing.

Careful regulation of fishing, public education of bull trout identification and attention to spawning bed access management are required to conserve bull trout within the plan area. Restrictions for the recreational fishery include no fishing in the Upper Nass or Upper Skeena watersheds January 1 to June 15, with the regional daily catch quota at two per day from streams of which none can be under 30cm and only one can be greater than 50cm in length.

This plan provides direction for identifying bull trout habitat, which in turn will provide the basis for better stock management.

2.5.1.3 ***Management Direction for Fisheries***

Plan Goal for Fisheries Resources

- Protect fish populations by preserving, maintaining, and restoring fish habitat.

³⁵ For further information on the Wild Salmon Policy, refer to:
http://www-comm.pac.dfo-mpo.gc.ca/pages/release/bckgrnd/2005/bg013_e.htm

Objectives	Measures/Indicators	Targets
<p><i>1.0 Maintain habitat for indigenous fish populations</i></p>	<p>1.1 Number of fish bearing streams, rivers and lakes adversely impacted by industrial development except where permitted under applicable legislation.</p>	<p>Zero</p>
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Maintenance of salmon habitat consistent with the Wild Salmon Policy is a high priority - http://www-comm.pac.dfo-mpo.gc.ca/pages/release/bckgrnd/2005/bg013_e.htm. • Inventories to be conducted to identify all fish-bearing streams for the entire plan area, with emphasis on salmon, summer-run steelhead, bull trout, and dolly varden. Areas most likely to be affected by industrial development or potentially having vulnerable fish stocks should receive first funding priority. 	
<p><i>2.0 Restore habitat for indigenous fish populations</i></p>	<p>2.1 Percentage of damaged fish-bearing streams, rivers and lakes where pre-damage functionality is restored by operationally and financially feasible activities that do not cause further damage or interfere with natural restoration processes.</p>	<p>100%</p>
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Intent is to pursue funding to conduct habitat restoration work, recognizing that funding is not guaranteed. See Management Considerations under Objective 5.0 in Section 2.1.2 regarding a Watershed Restoration Plan. • Restoration of salmon habitat consistent with the Wild Salmon Policy is a high priority. • Restoration of the Kitwanga River-Gitanyow Lake sockeye salmon stocks to achieve the productive capacity of the system is a high priority. • Inventories to be conducted to identify all fish-bearing streams for the entire plan area, with emphasis on salmon, summer-run steelhead, bull trout and dolly varden. Areas most likely to be affected by industrial development or potentially having vulnerable fish stocks should receive first funding priority. 	

2.6 Cultural Heritage Resources

2.6.1 Overview of Cultural Heritage Resources

Cultural heritage resources include both intangible and tangible resources. Intangible resources are those such as oral histories, laws, customs, ceremonies, language, family crests and names, place names, and traditional knowledge. These cultural heritage resources evolved from and were shaped by the surrounding land and the natural resources of the land; they are directly and inextricably connected to and reliant upon the sustained presence and quality of the ecological resources of the land.

Tangible cultural resources include ecological resources: geographic features, soil, water, fish, wildlife, and plants of the land. Tangible cultural resources also include specific locations on the landscape (cultural sites), and broad areas (cultural areas), where traditional activities were, and are, pursued.

Examples of cultural sites include, but are not limited to: fishing sites; cabin sites; village sites; medicinal plant sites; spiritual sites; culturally modified trees; grave sites; and cache pit sites. Examples of the broader cultural areas are hunting areas and trapping areas.

Archaeological Sites and Heritage Sites are a subset of cultural sites where archaeological investigations have occurred.

Gitanyow has prepared, completed, and reviewed with the Province of B.C. and Forest Licensees a cultural heritage policy entitled *The Gitanyow Policy Manual for Management of Cultural Heritage Resources*, September 13, 2009. It is a Gitanyow document that stresses the importance of cultural and natural resources to the Gitanyow culture; it sets forth policies and procedures for identification and management of these resources.

Over the past several decades, development activities such as timber harvesting as well as logging road and highway construction have damaged or destroyed many cultural resources. Development has been initiated with inadequate knowledge of, and concern for, traditional use and cultural resources.

This plan incorporates direction for resource management intended to sustain cultural resources and opportunities for traditional use of the land by current and future generations. This chapter deals primarily with cultural sites whereas other chapters focus on management of the natural resources of the land.

2.6.2 Management Direction for Cultural Heritage Resources

Plan Goal for Cultural Heritage Resources

Recognize and respect Gitanyow and Nisga'a traditional areas, values, and activities so that they may exercise their aboriginal rights on the landscape.

Objectives	Measures / Indicators	Targets
1.0 Preserve cultural sites	1.1 Number of pre-1846 cultural sites with their integrity maintained, except where authorized by applicable legislation and consented to by Gitanyow.	All
	1.2 Number of post-1846 cultural sites with their integrity maintained except where consented to by Gitanyow, or by NLG if the site is a Nisga'a site.	All

Objectives	Measures / Indicators	Targets
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Preservation refers to mapped and unmapped cultural heritage sites. • Cultural sites and resources include but are not limited to culturally modified trees (CMTs), trails, cache pits, house pits, grave sites, fishing sites, pictograph sites, smoke houses, cabins, camping sites and archaeological sites. Cultural areas include hunting, fishing and berry-picking areas. • Management of cultural sites should be consistent with the <i>Gitanyow Policy Manual for Management of Cultural Heritage Resources, September 13, 2009</i>³⁶. The cultural heritage policy addresses: <ul style="list-style-type: none"> • measures for preservation of different groupings of cultural heritage resources, • consultation protocols, and • procedures designed to develop effective working relationships between Gitanyow and development proponents. • Management of cultural heritage sites is to be consistent with the <i>Nisga'a Final Agreement</i>, as applicable under Chapter 17, paragraphs 37 and 38. • Gitanyow are to update the database of Gitanyow sites annually. • Best efforts should be undertaken by Gitanyow, the Province and forest licensees to locate, with a GPS, the remaining sections of the Grease Trail within the plan area. 	
<p>2.0 <i>Preserve cultural heritage resources</i></p>	<p>2.1 Percentage of authorizations issued for timber harvesting or road construction where consultation occurs to facilitate continued traditional uses of cultural heritage resources.</p>	<p>100%</p>
	<p>2.2 Percentage of identified sites that are reported to Gitanyow, NLG, forest licensees, and government for use in a database.</p>	<p>100%</p>

³⁶ For a copy of the *Gitanyow Policy Manual for Management of Cultural Heritage Resources, September 13, 2009* contact the Gitanyow Hereditary Chiefs

Objectives	Measures / Indicators	Targets
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Cultural sites and resources include but are not limited to culturally modified trees (CMTs), trails, cache pits, house pits, grave sites, fishing sites, pictograph sites, smoke houses, cabins, camping sites and archaeological sites. Cultural areas include hunting, fishing and berry-picking areas. • Continued mapping of cultural heritage resources is required. • Management of cultural heritage resources should be consistent with the <i>Gitanyow Policy Manual for Management of Cultural Heritage Resources, September 13, 2009</i>. The cultural heritage policy addresses: <ul style="list-style-type: none"> • measures for preservation of different groupings of cultural heritage resources, • consultation protocols, and • procedures designed to develop effective working relationships between Gitanyow and development proponents. • Management of cultural heritage resources is to be consistent with the <i>Nisga'a Final Agreement</i>, as applicable under Chapter 17, paragraphs 37 and 38. • Archaeological sites are traditional use sites where archaeological investigation has occurred and where physical evidence of past human activity has been found. Examples include culturally modified trees, trails, cache pits, house pits, grave sites, pictograph sites, smoke houses, cabins, artifacts and areas traditionally used for camping, hunting, fishing and berry-picking. 	
<p>3.0 Address Gitanyow and Nisga'a interests in access to cultural sites</p>	<p>3.1 Proportion of cultural sites where Gitanyow and Nisga'a access interests are addressed.</p>	<p>100%</p>
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Following consultation, interests are addressed regarding access concerns occurring before, during and following industrial development. 	
<p>4.0 Identify and record locations of CMTs; minimize impact to these where appropriate</p>	<p>4.1 Percentage of identified CMTs of any historical date, recorded in a Gitanyow database, or reported to NLG if the CMT is from the Nisga'a.</p>	<p>100%</p>
	<p>Management Considerations</p> <ul style="list-style-type: none"> • When collecting CMT-related information, best efforts should be made by forest licensees to use the procedures manual, "Recording Culturally Modified Trees", located at: http://www.tca.gov.bc.ca/archaeology/policies/recording_culturally_modified_trees.htm • The Gitanyow Cultural Heritage Policy includes comprehensive CMT Policies and BMP's for CMT management. 	

Objectives	Measures / Indicators	Targets
<p>5.0. <i>Maintain a sustainable source of cedar for Gitanyow traditional, cultural and subsistence use</i></p>	<p>5.1 Percentage of polygons identified on Map 17: Cedar Management Areas and specified in the <i>Plan for a Long-Term Sustainable Supply of Cedar from Gitanyow Traditional Territory for Gitanyow Cultural and Domestic Purposes</i>, March 12, 2008, that are fully reserved for Gitanyow management and harvest.</p>	100%
	<p>5.2 Percentage of proposed cutblocks having a component of cedar, where consultation with the Gitanyow around the use of cedar occurs.</p>	100%
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Gitanyow are required to identify to licensees their traditional, cultural and subsistence needs. • Identify the amount of available supply of cedar for Gitanyow needs. • Licensees are required to consult with the Gitanyow on proposed or planned cutblocks that have a cedar component. • NLG will be consulted concerning the development and implementation of forestry plans, including but not limited to, forest stewardship plans, forest management and harvesting plans in accordance with the <i>Nisga'a Final Agreement</i>. 	
<p>6.0 <i>Reserve land surrounding Gitanyow Lake for Gitanyow management of cultural heritage resources</i></p>	<p>6.1 Percentage of the polygon identified as Gitanyow Lake Reserve on Map 19: Parks and Land Use Areas that is fully reserved for Gitanyow management</p>	100%
	<p>Management Considerations</p> <ul style="list-style-type: none"> • The land surrounding Gitanyow (Kitwancool) Lake is the location of many known and yet-undiscovered archaeological sites, and has a long history of occupation and use by Gitanyow. • Reserving the land will protect the area from further development, and will allow the orderly discovery and assessment of archaeological sites • Reserving the land will provide opportunities for Gitanyow to develop a cultural-educational museum of Gitanyow history and will contribute to Gitanyow economies and self-sufficiency. 	

2.7 Timber

2.7.1 Overview of Timber Resources

Several biogeoclimatic ecosystems characterize the Cranberry SRMP area, due to its proximity to coastal influences along the western boundary and interior influences along the eastern boundary. Within the plan area, both the coastal and interior ecosystems express variances as they transition from west to east, and are impacted by influences from the Coast Mountain Range.

The majority of the timber harvesting land base is located along the Highway 37 corridor. At lower elevations, these forests are comprised of ecosystems classified as Interior Cedar-Hemlock Moist Cold Subzone/Nass Variant (ICHmc1), and Interior Cedar-Hemlock Moist Cold Subzone/Hazelton Variant (ICHmc2), with mid-elevation ecosystems of Coastal Western Hemlock Sub Maritime Subzone Montane Variant (CWHws2). At higher elevations, ecosystems are predominantly Engelmann Spruce-Subalpine Fir/Wet Very Cold Subzone (ESSFwv), with minor areas of Mountain Hemlock Moist Maritime Leeward Variant (MHmm2).

The timber resource of the planning area consists primarily of Western hemlock and Subalpine fir (balsam), with components of Western Red cedar, Amabilis fir (balsam), Sitka-White-Engelmann spruce hybrids, Lodgepole pine, and deciduous species of birch, aspen, and cottonwood. Mature (age 140-250 years) and old (age 250+ years) forests of predominantly hemlock-balsam form the dominant forest types. Younger stands (age 0 to 140 years) of mixed hemlock-pine-spruce-balsam-cedar and deciduous resulting from previous fire history and logging operations are established along the major valleys at lower elevations. Deciduous forests of aspen and birch are of relatively small size and discontinuous distribution, and are located at low elevations. Stands of cottonwood-spruce dominate the floodplain ecosystems of the main river valleys.

Timber quality of the dominant mature and old growth forest types is poor, as it contains a high proportion of defect resulting in a high percentage of pulp quality timber and a low component of sawlog quality timber. Forest stands that are less than 200 years old are of relatively good quality, containing a moderate to high percentage of sawlogs.

Timber harvesting within the planning area has taken place throughout the past five decades. Historically, harvesting concentrated on low elevation, younger timber types situated on gentle to moderate terrain that provided lower cost development and harvesting of forest stands of the highest sawlog component. Even when markets for pulp quality timber were strong, harvesting concentrated on the highest quality timber stands in order to maintain a steady flow of sawlogs to sustain local sawmills. Currently, due to poor log market conditions and high operating costs, licensees are unable to economically harvest forest stands of a high pulp component; harvesting operations are now focused on stands of high sawlog content, high cedar content, and low pulp content. Stands of low quality and high development and harvesting costs are being avoided and deferred to the future. With poor log markets currently and in the foreseeable future, it is expected that this practice will continue throughout the plan area.

Throughout the past several decades, the harvesting and milling of timber and the silviculture work of reforestation and tending the regenerating forests have provided employment for local residents and contributed to economic stability for local communities. Maintenance of a sustainable timber harvesting and milling industry while maintaining the sustainability of non-timber forest resources is vital to maintaining the stability, economic, and social well being of these communities.

The Cranberry SRMP sets objectives and targets to provide licensees with higher-level direction consistent with the results-based framework of the *Forest and Range Practices Act*. This will provide licensees with the flexibility to develop harvesting plans that can respond to changes in market conditions.

A timber supply analysis was conducted to assess the implications of those management objectives and targets. The results show that if implemented, the Cranberry SRMP will result in a decrease in the long-

term timber harvest level by 14%. For details, see **Appendix F and G: Timber Supply Analysis Data Package and Report**.

Dothistroma needle blight has impacted a significant portion of young lodgepole pine stands in the ICH biogeoclimatic zone. Management strategies have been implemented, such as limiting the planting of lodgepole pine in the ICH in order to halt the spread of this forest disease. The Ministry of Forests, Lands and Natural Resource Operations continues to monitor existing young lodgepole pine stands for infestation, and is developing management strategies to address areas which are not sufficiently restocked.

The provincial government is currently considering the potential of forest management to sequester and store carbon, and to generate revenue from the sale of carbon credits derived from areas of forest land reserved from timber harvesting as part of the development of ecosystem-based forest management.

Cranberry SRMP requirements will ensure that future forest development is sustainable, and that non-timber values are properly managed.

2.7.2 Management Direction for Timber

Plan Goals for Timber Resources

- Promote full utilization of productive sites while providing stable or increased harvest levels.
- Develop a sustainable and economically viable forest industry that contributes to the local community over the short and long terms, while respecting Gitanyow and Nisga’a interests.

Objectives	Measures / Indicators	Targets
1.0 <i>Dedicate and maintain a productive timber harvesting land base, that promotes an economically sustainable forest industry.</i>	1.1 Net area of timber available for harvest.	Identify and maintain
	Management Considerations <ul style="list-style-type: none"> • Management of the timber harvesting land base is to consider and respect non-timber resources and maintain Wilp sustainability. 	
2.0 <i>Avoid timber harvesting within proposed treaty settlement lands shown on Map 8: Gitanyow Claimed House Territories and Treaty Settlement Lands Offer (2002)</i>	2.1 Amount of timber harvesting occurring within proposed treaty settlement lands.	Zero
	Management Considerations <ul style="list-style-type: none"> • Preservation of proposed treaty settlement lands does not constitute acceptance by Gitanyow of this offer. 	

Objectives	Measures / Indicators	Targets
<p>3.0 <i>Manage the forest harvest to represent the timber quality and terrain profile</i></p>	<p>3.1 Stands harvested with age greater than 250 years.</p>	<p><i>Proportionate to occurrence within Licensee operating area</i></p>
	<p>3.2 Stands harvested on slopes greater than 35%.</p>	<p><i>Proportionate to occurrence within Licensee operating area</i></p>
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Timber harvest will represent the timber quality and terrain profile of the planning area to the extent possible, as determined by timber type and quality, market prices and operational costs, and remain at the discretion of the licensee. The intent is to harvest the profile, while retaining opportunities for the economic viability of the licensee. • Monitor the terrain and timber profile harvested. Performance in harvesting the profile as averaged over a five-year period should be submitted to the Chief Forester together with a recommendation that the harvesting performance be considered in the AAC determination. 	
<p>4.0 <i>Maintain the long-term health and site productivity of the timber harvesting land base.</i></p>	<p>4.1 Long-run sustained yield.</p>	<p>Maintain or increase</p>
	<p>4.2 Mean annual increment.</p>	<p>Maintain or increase</p>
	<p>Management Considerations</p> <ul style="list-style-type: none"> • Implement silvicultural systems and treatments to realize overall productivity within the timber harvesting land base. • Consider local forest pests and diseases (e.g. lodgepole pine vulnerability to Dothistroma needle blight) when re-stocking sites. • Consider the effects of climate change on forest health and site productivity. 	
<p>5.0 <i>Limit conversion of the available productive forest land base for non-timber purposes.</i></p>	<p>5.1 Area permanently removed from the productive forest, for purposes other than timber harvesting.</p>	<p>Minimize</p>
	<p>Management Considerations</p> <ul style="list-style-type: none"> • It is recognized that some conversion will occur; this will be addressed by the Joint Resources Council on a case-by-case basis. Examples of conversion include, but are not limited to, agriculture and the establishment of utility corridors. • Efforts should focus on minimizing duplication of access by other resource sectors (e.g. shared use of logging roads by the mining sector). 	
<p>6.0 <i>Develop long-term plans that</i></p>	<p>6.1 Percentage of plans where Gitanyow and NLG interests are incorporated.</p>	<p>100%</p>

Objectives	Measures / Indicators	Targets
<p><i>recognize and respect Gitanyow and Nisga'a interests in the forest resource.</i></p>	<p>Management Considerations</p> <ul style="list-style-type: none"> • NLG will be consulted concerning the development and implementation of forestry plans, including but not limited to, forest stewardship plans, forest management and harvesting plans in accordance with the <i>Nisga'a Final Agreement</i>. • Gitanyow and licensees are to develop a standardized protocol for ensuring Gitanyow interests are recognized (e.g. number of meetings, meeting locations, and items to cover). 	

2.8 Special Resource Management Zones

2.8.1 Overview of Special Resource Management Zones

Special Resource Management Zones (SRMZ) are areas where management direction for some resource values is incremental to general management direction.

The Cranberry SRMP identifies two zones for area-specific management. These are shown on **Map 18: Water Management Units** and on **Map 19: Parks and Land Use Areas**. Management objectives, developed for each SRMZ, address values that are specific to that area.

Also shown on **Map 19** at the very southern tip of the Cranberry SRMP boundary is the Mill Creek Sensitive Area. It was established as a Sensitive Area under Section 5 of the *Forest Practices Code of British Columbia Act* in 1999. It reserves a rare old growth Western red cedar stand of 26 hectares and adjacent zone from timber harvesting. The total area is approximately 120 hectares in size.

The Mill Creek Sensitive Area Plan and its associated “Order to Establish a Sensitive Area and Objectives” continues to provide legally-binding direction for forest management and must be reflected in operational plans. The document can be found at the following location: <http://ilmbwww.gov.bc.ca/slrp/srmp/north/cranberry/index.html>.

2.8.1.1 Water Management Units

Water Management Units with SRMZ status (illustrated on **Map 18: Water Management Units**) encompass the valley walls and headwater bowls of many large rivers and streams of the plan area. The WMUs are located within steep, broken, mountainous terrain and have many first and second order streams tributary to the main valley bottom streams. These streams are generally closely spaced, in small to large gullies or canyons, frequently within avalanche tracks, and are susceptible to changes in flow regime and water quality.

Soils within the WMUs are primarily fine textured glacial till deposits of varying depth over sedimentary bedrock. Valley slopes are steep, generally 50% to 70% in gradient, and continuous from valley bottom to ridge top. Throughout the WMUs there is evidence of past and current slope instability. The majority of the area within the WMUs is considered to be within the hydriparian zone.

Timber development within the WMUs would result in continuous high steep cut-and-fill road slope vulnerable to erosion, with resultant deposition into down slope streams, and may increase the potential for mass wasting and changes to the natural hydrologic regime. Downstream resource values are high, including fisheries, wildlife, industrial roads, Gitanyow village infrastructure, and Highway 37.

The WMUs are situated primarily within the Engelmann Spruce-Subalpine Fir/Mountain Hemlock/Alpine Tundra biogeoclimatic zones, with lesser areas of Coastal Western Hemlock/Interior Cedar-Hemlock biogeoclimatic zones at lower elevations. These areas support mid to high elevation forests characterized by heavy snow accumulations; removal of forests in such areas may result in increased accumulations of

snow, acceleration of snow melt, synchronization of higher and lower elevation snow melt, and increased peak flows. The forests are considered unique, with high conservation values for water quality and watershed hydrology.

The Water Management Units are primarily outside of the timber harvesting land base. However, they are not reserved from timber harvesting or other industrial activities. The Cranberry SRMP determined that the high sensitivity of water quality and hydrology regime of these steep, broken valleys and headwater bowls demand special management to ensure that industrial operations avoid or minimize impact to water quality and watershed hydrology.

2.8.1.2 *Management Direction for Water Management Units*

Plan Goal for Water Management Units

- Manage surface water and groundwater to maintain water quality and peak and low flows within the range of natural variability, and protect the hydrologic integrity of the watersheds.

Objective	Measures / Indicators	Targets
1.0 <i>Ensure proper hydrological functioning of streams, lakes and wetlands within water management units identified on Map 16</i> Water Management Units	1.1 Number of new roads allowed within Water Management Units for commercial forestry operations.	0
	1.2 Number of roads currently existing within a Water Management Unit that are permanently deactivated following completion of harvesting and silviculture obligations.	All
	1.3 Proportion of wetlands, lakes and streams that have full retention of the forested area of their hydriparian zone ³⁷ , excluding harvesting for traditional uses, mining, compelling forest health issues, or variances as stated in measure 1.4 below.	100%
	1.4 Variance by which cutblocks overlapping the water management unit boundary may extend into the unit, while maintaining the riparian management practice applicable to the forest land base outside of it.	Up to 50% of the cutblock area, or up to 200 metres in distance, whichever is less
	Management Considerations	
<ul style="list-style-type: none"> • Management intent is to provide operational flexibility for cutblock planning, and to account for inaccuracies due to the scale of mapping. 		
	1.5 “Functioning condition” as defined by the	Properly functioning ³⁸

³⁷ Hydriparian zone as defined in item 4 of Table 8.

³⁸ “Properly Functioning” for a stream, river, wetland or lake and its riparian area means:

Objective	Measures / Indicators	Targets
	<p><i>Protocol for Evaluating the Condition of Streams and Riparian Management Areas</i>, for each local and downstream stream receiving water from a cutblock within the Water Management Unit.</p>	
	<p>Management Considerations</p> <ul style="list-style-type: none"> • The assessment protocol is available online at: http://www.for.gov.bc.ca/hfp/frep/site_files/indicators/Indicators-Riparian-Protocol-May2007.pdf • Monitoring to include streams within cutblocks and streams down slope from cutblocks to which cutblock streams are tributary. The intent is to assess the cumulative hydrological impacts of accelerated snowmelt and groundwater interception as small in-block streams merge down slope from the cutblocks. 	

2.8.1.3 Upper Kispiox Special Management Zone

The Kispiox LRMP designated the Nangeese-Kispiox area adjacent to the Swan Lake Protected Area as a Special Management Zone (see **Map 19: Parks and Land Use Areas**).

The SMZ contains extensive grizzly bear habitat, ranked provincially significant, very high, and high. Riparian features of the zone contribute significantly to water quality of the Kispiox River. The Kispiox River provides highly productive fish habitat, supports a world-renowned steelhead fishery, and recreationally and commercially valuable salmon stocks.

The intent of the Upper Kispiox Special Management Zone is to emphasize the maintenance of identified natural and cultural features and attributes within the Upper Kispiox area. The primary objectives of the SMZ are to place special emphasis on the maintenance of wildlife habitat, water quality, and fish habitat. Commercial resource extraction is acceptable, but is secondary to maintenance of the other values of the area.

Objectives, measures, and targets designed specifically for the SMZ are identified in Section 2.8.1.4 below. Objectives, measures, and targets that apply generally to the remainder of the Cranberry SRMP are also applicable to the SMZ, and are not repeated in this section of the SRMP.

-
- the ability to withstand normal peak flood events without experiencing accelerated soil loss, channel movement or bank movement;
 - the ability to filter runoff;
 - the ability to store and safely release water;
 - ability of riparian habitat to maintain an adequate root network or large woody debris supply;
 - ability of riparian habitat to provide shade and reduce bank microclimate change; and,
 - fish habitat in streams and riparian areas are fully connected so that fish habitat is not lost or isolated as a result of some management activity.

2.8.1.4 *Management Direction for the Upper Kispiox Special Management Zone*

Plan Goals for the Upper Kispiox Special Management Zone

- Primary goal is to maintain key resource values such as wildlife habitat, water quality, fish habitat, and cultural heritage resources.
- Secondary goal is to allow identified economic opportunities to prevail.

Objectives	Measures / Indicators	Targets
1.0 <i>Ensure proper hydrological functioning of all streams, lakes, and wetlands within the Upper Kispiox SMZ as identified on Map 19: Parks and Land Use Areas</i>	1.1 Proportion of wetlands, lakes and streams that have full retention of the forested area of their hydroriparian zone ³⁹ , excluding harvesting for road access, traditional uses, mining, or compelling forest health issues	100%
	1.2 “Functioning condition” as defined by the <i>Protocol for Evaluating the Condition of Streams and Riparian Management Areas</i> , for each local and downstream stream receiving water from a cutblock within the Upper Kispiox SMZ.	Properly functioning ⁴⁰
	Management Considerations <ul style="list-style-type: none"> • Assessment protocol is available online at: http://www.for.gov.bc.ca/hfp/frep/site_files/indicators/Indicators-Riparian-Protocol-May2007.pdf • Monitoring to include streams within cutblocks and streams down slope from cutblocks to which cutblock streams are tributary. The intent is to assess the cumulative hydrological impacts of accelerated snowmelt and groundwater interception as small in-block streams merge down slope from the cutblocks. 	
2.0 <i>Minimize long-term displacement of grizzly bears from industrial</i>	2.1 Proportion of timber harvested when the ground is frozen or there is compressed snow pack of ≥ 1 metre.	100%

³⁹ Hydroriparian zone as defined in item 4 of Table 8.

⁴⁰ “Properly Functioning” for a stream, river, wetland or lake and its riparian area means:

- the ability to withstand normal peak flood events without experiencing accelerated soil loss, channel movement or bank movement;
- the ability to filter runoff;
- the ability to store and safely release water;
- ability of riparian habitat to maintain an adequate root network or large woody debris supply;
- ability of riparian habitat to provide shade and reduce bank microclimate change; and,
- fish habitat in streams and riparian areas are fully connected so that fish habitat is not lost or isolated as a result of some management activity.

Objectives	Measures / Indicators	Targets
<i>access development</i>	2.2 Number of roads that are constructed to avoid line of sight > 300 metres and minimize right of way widths	All
	2.3 Number of roads, excluding mainline roads, that are deactivated to a standard that will restrict motor vehicle access, immediately following completion of primary forest activities, or within one year if roads are currently inactive	All
	2.4 Number of mainline roads where access is controlled following the completion of primary forest activities, to achieve a reduction in motorized accessibility to the SMZ	All
	2.5 Distance between patches of security cover within or adjacent to cutblocks	80% no greater than 200 metres
	2.6 Number of industrial camps (e.g. logging, road development, silviculture, mining, power development) permitted within the SMZ	0
	2.7 Level of applied Biodiversity Emphasis Option.	High
<p>Management Considerations</p> <ul style="list-style-type: none"> Industrial development within the SMZ should be planned for concentration over a short time period, followed by a long time period (e.g. 10 to 25+ years) of no development. Only temporary camps for road and cutblock engineering should be allowed in the SMZ. De-activate access roads within the SMZ to minimize the length of drivable road, immediately following completion of primary forestry activities (harvest and reforestation). The first priority for road location, design, construction, and use is to ensure the protection and maintenance of water quality and fish habitat and to minimize impacts on grizzly bear. Considerations for timber development are secondary to protection of the natural resources. Cut block design should consider use of selection and small patch cut (e.g. 1.0 ha to 5.0 ha) systems as well as larger clearcuts (e.g. >10 ha) with high levels of retention, to provide a mosaic of stand ages and structures and short sight line distances for visual screening. Patch sizes should reflect the habitat value and should be smaller (e.g. <2 ha) in or adjacent to high value habitats. Patch sizes could be larger in lower value habitats (e.g. <5 ha for moderate and >5 ha for low habitat values). Retention within and adjacent to cutblocks should provide visual screening for security cover and should increase with the increasing size of the opening (e.g. openings of 1.0 to 5.0 ha with 		

Objectives	Measures / Indicators	Targets
	<p>10% to 20% retention; openings 5.0 to 10.0 ha with 20% to 30% retention; openings > 10.0 ha with 30+% retention).</p> <ul style="list-style-type: none"> • Grizzly bears are an “umbrella” species. Habitat and access management for grizzly bears also provides protection for water quality, fish habitat, and other wildlife species. • Security cover provides visual screening, especially from roads, and exists when vegetation prevents grizzly bears from being sighted. 	

3. Plan Implementation, Monitoring and Amendment

Following government approval of the Cranberry SRMP, the management objectives and targets will be applied through a dual process of implementation and monitoring. Responsibility for plan implementation and monitoring is shared between government agencies and stakeholders. The Gitanyow and NLG are encouraged to be involved in both the administration side of the implementation and monitoring processes, as well as in operational decision-making.

3.1 Implementation

The Ministry of Forests, Lands and Natural Resource Operations will be establishing the Cranberry SRMP area as a single landscape unit; objectives and targets within the plan will be established as landscape unit objectives.

3.2 Monitoring

The monitoring phase of the plan involves ongoing assessment of how well the management objectives of the SRMP are being implemented, as well as how effective the objectives are at meeting their intents. Resource values in the plan area are subject to varying degrees of risk from development activities. High-risk resource values will require more regular monitoring than will low-risk resource values. This will be reflected in the SRMP monitoring plan.

3.3 Amendment

A variety of factors will be considered when evaluating the need for plan amendment. The plan may be amended if:

1. The Province, NLG and Gitanyow agree to undertake planning to further integrate Gitanyow and NLG interests into the SRMP. The amendment process would include consultation with the public and stakeholders.
2. Monitoring results show that the SRMP objectives are ineffective in achieving the plan goals. The amendment process would include consultation with NLG, Gitanyow, the public, and stakeholders.
3. Monitoring results show that the indicators and targets are ineffective in achieving plan objectives. If there is minimal social or economic impact, the plan will be amended to incorporate new indicators and targets with a minimum of consultation.
4. Monitoring results show that indicators and targets are ineffective in achieving plan objectives. If there is significant social or economic impact, the amendment process would include consultation with the Gitanyow, NLG, the public, and stakeholders.
5. If monitoring results show that the management direction is ineffective in achieving plan targets and indicators, new management considerations can be developed without amending the plan itself.

The SRMP, and/or legal objectives that have been established to implement the SRMP, should be reviewed at least every 10 years to ensure the plan objectives are still relevant and provide the appropriate balance between social, economic and environmental objectives.

Appendix A: General Wildlife Tree Management Guidelines

1. Where practicable, disperse wildlife trees across harvested areas as a combination of patches and individual trees. It is recognized that dispersed retention can work on most ground-based logging systems, but is not operationally always feasible for cable systems.
2. The practicability of retaining wildlife trees, in small patches and through dispersed individual trees, is to be determined on a block-by-block basis.
3. Make best efforts to retain greater than the minimum percentage of within-block wildlife trees.
4. Wildlife tree features:
 - Deciduous and coniferous trees
 - Large, well-branched, wind-firm
 - Decadent, i.e. low commercial value
 - Pine mushroom host trees
 - Trees and snags that show current use by wildlife (e.g. denning or nesting trees, feeding stations)
 - Trees or snags that provide special wildlife values (e.g. large, well-branched trees, large snags, veteran trees)
 - Safe to leave standing (i.e. comply with Workers Compensation Board standards and regulations)
 - Located with more or less even spacing across the harvested area to provide nutrients, and water absorption and release, across the harvested block
5. Wildlife tree retention area features:
 - Mineral licks, wetlands, springs, brush patches, small streams
 - Medicinal plants for Gitanyow and Nisga'a traditional use
 - Pine mushroom habitat
6. Designate and retain wildlife trees within all silvicultural systems, including selection and clearcutting systems.
7. Wildlife trees to be retained at least until other suitable trees can offer equivalent replacement values. This will take at least one rotation (at least 100 years).
8. Retain high densities (30 percent or greater) of wildlife trees:
 - within the large cutblocks (retention densities to increase as size of cutblocks increase),
 - throughout the harvestable portion of ecosystem networks, and
 - throughout all harvested blocks within High value grizzly bear habitat and moose wintering habitat.
9. Wildlife tree retention areas are allowed to be located on the edge of cutblocks. Best efforts are to be made to limit the location of wildlife tree retention areas on edges. It is recognized that even though a wildlife tree retention area is on the edge upon harvesting the cutblock, it will not be on the second or third pass. A wildlife tree retention area is a recognized exclusion from the cutblock and must be maintained.
10. Allow natural processes to occur within retention areas unless infestations, infection or fire threaten resources outside the area.
11. Where intervention in wildlife tree retention areas is required, best efforts will be made to retain a diversity of structural attributes, or a replacement retention area will be located.
12. Document the contribution to wildlife tree retention targets in an appropriate information system.

Appendix B: Moose Habitat Attributes for Life Requisites

Compiled by Len Vanderstar, R.P. Bio, R.P.F., Ministry of Forests, Lands and Natural Operations, Skeena Region, from surveys and published species accounts.

Life Requisite	Habitat Attribute and Description
Forage Habitat	<p>Structural Stage</p> <ul style="list-style-type: none"> • Early seral stages (3 and 4: herb-shrub and pole-sapling) usually provide ideal foraging conditions, supporting abundant deciduous browse year-round within secondary winter range. • Valley bottom fluvial complexes that define primary winter range are noted for providing abundant forage, by virtue of containing many pocketed or larger seasonally wet open areas, regardless of structural stage. • Aquatic habitats provide moose with aquatic forage during spring and summer. Buckbean (<i>Menyanthes trifoliata</i>), pondweed (<i>Potamogeton spp.</i>), and sedges are the predominant aquatic forage species noted in the Nass watershed. <p>Shrub Cover</p> <ul style="list-style-type: none"> • Shrub-dominated habitats that occupy 15 to 30% of a defined area (e.g. moose winter range) generally provide sufficient forage in both growing and winter seasons, provided that height requirements (below) are met. <p>Shrub Height</p> <ul style="list-style-type: none"> • 1 to 5 m for growing season (also assists in providing visual screening); >2.5 m for winter forage. <p>Shrub Species Composition</p> <ul style="list-style-type: none"> • Important woody browse includes willow, red-osier dogwood, high-bush cranberry and young subalpine fir; black twinberry, elderberry, mountain ash, aspen and cottonwood are also utilized depending on availability. <p>Aspect</p> <ul style="list-style-type: none"> • Site aspect is generally not important. However, south- and west-facing slopes have reduced snow depths and are first to be snow-free in spring. This provides moose access to shrub cover, early spring herbaceous emergents and green-up forage. <p>Landscape Position</p> <ul style="list-style-type: none"> • Valley bottom floodplains and other fertile drainages/areas have high forage productivity and diversity, particularly for early spring green-up forage.
Thermal Cover	<p>Basal Area</p> <ul style="list-style-type: none"> • 10% measured by pre-harvest mature and old forest cover. <p>Species Composition</p> <ul style="list-style-type: none"> • Thermal cover species should be composed of large canopy, somewhat open grown conifer species, notably very mature and old-growth spruce and subalpine fir.

Life Requisite	Habitat Attribute and Description
Snow Interception	<p>Canopy Cover</p> <ul style="list-style-type: none"> In areas of high snowfall, moose movement is facilitated by forests with crown closure of exceeding 50%. <p>Area Coverage</p> <ul style="list-style-type: none"> No literature is available; however, given snow depths associated with the Nass South SRMP area (north of the Cranberry SRMP area), MFLNRO recommends more than 30% of winter range to have favourable snow interception canopy cover.
Security Cover	<p>Visual Screening</p> <ul style="list-style-type: none"> Stem density that obscures 90% of the moose at 60 m provides optimum visual screening, thus enhancing the animals' sense of security. A diverse understory that obscures a moose at close range also provides effective security cover. Gullied terrain may offer security opportunities, and could be considered good security habitat. <p>Structural Stage</p> <ul style="list-style-type: none"> Suitable security cover could occur in structural stages 3, 4, 5, 6 and 7; however, the best security cover will likely occur in structural stages 3, 4 and 5 (5 being young forests).
Calving	<p>Landscape Position</p> <ul style="list-style-type: none"> Forested patches with good security cover, surrounded by extensive wetland complexes, forested peninsulas (water or wetland), and islands, are primary calving sites. <p>Adjacency</p> <ul style="list-style-type: none"> Isolation or seclusion of calving sites is critical.
Rutting Areas	<p>Landscape Position</p> <ul style="list-style-type: none"> Optimum rutting areas include subalpine meadow complexes, wetland complexes, extensive floodplains, early to mid-seral natural wildfire burned areas, and deciduous stands adjacent to high forage areas. <p>Adjacency</p> <ul style="list-style-type: none"> Isolation or seclusion of rutting areas ensures minimal disturbance to moose activity, and thus more successful mating behaviour.

Appendix C: Best Management Practices for Moose Winter Range

Within moose winter range designated Ungulate Winter Range:

- The forest management focus of the slope adjacent to the floodplain is to provide for security cover.
- Forests within moose winter range will have a forage management emphasis when the site series (subhygric to hydric) that produce deciduous browse species such as willow (*Salix* spp.), dogwood (*Cornus stolonifera*), and cottonwood (*Populus trichocarpa*) become the predominant (more than 50%) site series from a stand-level perspective (e.g. cutblock or overview mapping perspective at 1:20 000 scale). Stand spacing, pruning, reduced conifer-stocking standards and varied conifer spacing will assist in promoting the duration of early seral stage conditions.
- Incorporate moose winter ranges in the design and application of forest connectivity.
- Retain willow and dogwood browse, particularly along island and floodplain channels.
- Retain security and thermal cover in proximity to useable forage areas appropriate to the size of the habitat unit.
- Retain a proportion of mature and old-growth conifer stands with canopy structures which will trap snow and provide bedding sites, particularly adjacent to foraging areas.
- Retain a percentage of large spruce and fir trees within deciduous leading stands, for thermal cover and bedding microsites.
- In regenerating areas and plantations where security and thermal cover are lacking, identify conifer stands or large patches suitable for future cover. Manage these for cover attributes that mimic natural forests in terms of visual screening and large, well-formed branchy veteran trees capable of snow interception and provision for thermoregulation.
- Encourage rotational forest stand development (i.e. harvest at early stand maturity) on sites conducive to both early seral forage and conifer production, while considering visual screening and snow interception.
- Provide adequate security cover within 100 metres line-of-sight in any given direction. Mature and old stands, stand retention or wildlife tree retention areas should be in the range of 200 metres apart, to provide the combination of thermal and security cover.
- Preference will be given to ground-based vegetation management.
- Maintain the natural deciduous/conifer mix of tree species and shrubs as expected for early seral conditions in prime forage potential sites.
- Allow for natural establishment of willows along decommissioned road right-of-ways.
- Limit road development and recreational use within moose winter ranges. Where road avoidance is not practicable, use measures to maintain security, such as maintaining dense coniferous visual screens, deactivating/closing roads before November, building temporary roads and/or rehabilitation road right-of-ways.
- Where practicable, minimize moose disturbance in winter by using measures such as: geographically focusing roads and operations within a given winter range, restricted access and timing of activities.
- Where practicable, retain, enhance or plant visual screens to obscure the winter ranges from high-use transportation corridors.
- Leave a proportion of large old-growth trees for moose predator-response behaviour.

Appendix D: Minimizing Human-Bear Conflicts

The following information has been excerpted with permission from a March 25, 2007 letter from Debbie Wellwood, R.P.Bio., Raven Ecological Services, Smithers, B.C. to Len Vanderstar, R.P. Bio and R.P.F, Ministry of Environment, Skeena Region, Smithers, B.C.

Outline for strategies, targets and measures or indicators for objectives to minimize negative bear-human interactions

General Principles

- Risk of bear-human interactions is influenced by natural features such as habitat suitability, travel concerns (e.g., topographic features or trails that may funnel bears through an area), visibility concerns and other sensory concerns (e.g., loud creeks, winds). Availability of non-natural foods or other attractants will increase this risk. The focus should be on minimizing human activities in higher risk areas when and where possible.
- Human behaviour and types of activity also influence risk of bear-human interactions. Allowing bears to become food-conditioned greatly increases their risk of mortality and risk to the public, most commonly property damage and, rarely, serious human injury or death. Bear-proofing of non-natural foods and other attractants must be a high priority. A common problem is that many people are misinformed or do not understand the motivation, strength and abilities of bears. Frequently, people think they have a solution for storing non-natural foods and other attractants that is bear-proof and it is not. Living with Wildlife Foundation has a bear-resistant product testing program at <http://www.lwwf.org>. Expert input should be solicited where required to prevent bear access to non-natural foods and other attractants.
- Risk of bear mortality associated with bear-human conflicts will be strongly influenced by whether or not the activity is conducted with guns available for use.
- Risk of bear mortality associated with bear-human conflicts will also strongly be influenced by the level of appreciation for bears and knowledge and understanding about bears, including ways to prevent conflicts with bears.
- The level and intensity of bear-human conflicts can be reduced through bear-human conflict management programs where the following components may be applicable to reducing risk associated with a specific land use or activity:
 - Bear-human interactions risk assessment to identify bear-human conflict issues and provide recommendations for prevention of conflicts or risk reduction
 - Bear awareness and safety education program
 - Bear-proof waste and attractant management
 - Green-space management (e.g., in some situations it may be appropriate maintain green spaces to allow bears to move around an area and in others it may be appropriate to remove brush to increase visibility and remove bear foods)
 - Specific rules or regulations to ensure compliance may be required
 - Land use planning to minimize bear-human conflict will be most effective when land use and human activities are considered in the context of land uses and human activities in the surrounding landscape
 - Bear-human conflict management plan
 - Monitoring for bear-human conflict
 - Adaptive management as required

Table D-1: Strategies, targets and measures or indicators to prevent bear mortality resulting from bear-human interactions

Objective	Indicators	Targets	Strategies
<p>1. Minimize negative bear-human interactions (e.g., incidents or conflicts with bears, displacement of bears, mortality of bears).</p>	<p>Number of reports of negative bear-human interactions¹ Indicators may be further defined as follows:</p> <ul style="list-style-type: none"> • Number and severity of bear-human conflicts or incidents • Number of conflicts or incidents where bears access non-natural foods or other attractants • Number and severity of defensive encounters with bears • Number and severity of non-defensive encounters with bears • Number and severity of problem wildlife occurrence reports received by the Conservation Officer Service for bears • Number of reported kills (e.g., COS, Fish and Wildlife) • Number of defence of life or property kills • Number of bears poached • Estimated unreported mortality 	<p>Reduction in number of interactions over time¹ Targets may be further defined as follows:</p> <ul style="list-style-type: none"> • Ideal: No reported or unreported grizzly bear mortality as a result of negative bear-human interactions • Realistically: Low number reported or unreported grizzly bear human-caused mortality for entire SRMP area as a result of bear-human conflicts or incidents (i.e., no mortality associated with most land uses and human use activities) 	<p>Where possible, initiate programs to educate members of the public and visitors re low impact garbage and food handling methods¹</p> <p>Educate public regarding alternatives to shooting to reduce bear-human conflicts e.g., waste management strategies, trail closures etc.¹</p> <p>Strategies may be further defined as</p> <ul style="list-style-type: none"> • Educate people about bear awareness and safety. Include proactive (user group and activity specific) measures that can be taken to minimize negative bear-human interactions². • Implement bear-human conflict prevention programs designed to minimize negative bear-human interactions (e.g., preliminary risk assessment, bear awareness and safety, bear-proof management of non-natural foods and other attractants, best practices or requirements, green space management and planning to prevent bear-human conflicts). If appropriate, develop and deliver program on site, area or activity specific basis. • Conduct regular monitoring of bear-human conflict prevention programs to detect successes or

			<p>failures and revise as required to achieve objective.</p> <ul style="list-style-type: none"> • Enforce non-compliance with rules or regulations to ensure that non-natural foods and attractants are stored or secured using a bear-proof method (e.g., Park Regulation, COS Dangerous Wildlife Protection Order)
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¹ Taken from North Coast Land and Resource Management Plan (2005).

² Bear-human interactions will be avoided in most management situations to minimize bear-human conflicts. For some specialized management situations, some types of bear-human interactions may be considered appropriate (e.g., bear viewing). Recommend requiring bear-human conflict management plan for management scenarios that allow or promote bear-human interactions.

Table D-2. Strategies or BMPs recommended for consideration for various land uses and types of human activities

1.1.1. Objective	1.1.2. Land Use/Activity	1.1.3. Example Target Groups	1.1.4. Strategies/Best Management Practices
<p>1. Minimize negative bear-human interactions (e.g., incidents or conflicts with bears, displacement or mortality of bears).</p>	<p>Major Travel Routes</p>	<ul style="list-style-type: none"> • Ministry of Transportation and Infrastructure • Highways maintenance contractors 	<ul style="list-style-type: none"> • Install, monitor and maintain bear proof dumpsters • Scheduled garbage pick-up
	<p>Landfill/Dumps</p>	<ul style="list-style-type: none"> • Regional District • Industrial camps • Commercial recreation camps 	<ul style="list-style-type: none"> • Install, monitor and maintain electric fence to exclude bears.
	<p>Industrial Camps – permanent and semi-permanent</p>	<ul style="list-style-type: none"> • Exploration, mining and forestry companies • Government agencies (e.g., FLNRO, MOE, MEM) • Natural resources research and management consultants 	<ul style="list-style-type: none"> • Implement bear-human conflict prevention program such as preliminary risk assessment to avoid higher risk (i.e. selection of low and moderately low risk locations), camp locations, bear awareness and safety program, bear-proof management of non-natural foods and other attractants, best practices or requirements, green space management and planning to prevent bear-human conflicts). Recommend input from expert in bear-human conflict prevention.
	<p>Commercial recreation camps – permanent and semi-permanent</p>	<ul style="list-style-type: none"> • Guide Outfitters • Angling operations • Non-consumptive recreation (e.g., hiking, wildlife viewing etc.) 	<ul style="list-style-type: none"> • Same as per Industrial Camps.
	<p>Industrial – camping, hiking and working in bear country</p>	<ul style="list-style-type: none"> • Exploration, mining and forestry companies • Government agencies (e.g., FLNRO, MOE, MEM) • Natural resources research and management consultants. 	<ul style="list-style-type: none"> • Provide bear awareness and safety training to minimize bear-human interactions while working, recreating and camping in bear country. Contractors and personnel should clearly understand how to prevent interactions with bears. • Ensure bears do not have access to non-natural foods and other attractants.

1.1.1. Objective	1.1.2. Land Use/Activity	1.1.3. Example Target Groups	1.1.4. Strategies/Best Management Practices
	Commercial Recreation - camping, hiking and working in bear country	<ul style="list-style-type: none"> • Guide Outfitters • Angling operations • Non-consumptive recreation (e.g., hiking, wildlife viewing etc.) 	<ul style="list-style-type: none"> • Same as per Industrial
	Bear Viewing Activities	<ul style="list-style-type: none"> • Commercial operations • Provincial government (e.g., wildlife viewing promotion etc.) 	<ul style="list-style-type: none"> • Conduct a bear-human conflict risk assessment to evaluate appropriateness and feasibility on an operations specific basis and in the context of the surrounding landscape. • Evaluate cumulative effects of land use activities (e.g., other bear viewing activities, types of bear viewing activities, hunting and refugia for bears) • If the bear viewing operation is considered an appropriate activity, prepare a bear-human conflict risk management plan that identifies bear-human conflict issues and strategies to prevent bear-human conflicts. Note water-based viewing is generally considered to pose lower risk to bears and people. Viewing from non-motorized boats will generally have lower risk of impacts to bears than from motorized boats. • DO NOT promote wildlife areas for non-guided bear viewing
	Other commercial or recreational activities	<ul style="list-style-type: none"> • Mushroom pickers • Various recreation (e.g., hikers, backpackers, horse packing, All Terrain Vehicle users) 	<ul style="list-style-type: none"> • Promote bear awareness and safety training to minimize bear-human interactions while working, recreating and camping in bear country. Audience should clearly understand how to prevent interactions with bears
	Fisheries Operational Activities	<ul style="list-style-type: none"> • Fisheries and Oceans Canada (e.g., fish counting i.e. Meziadin Fishway; spawning 	<ul style="list-style-type: none"> • Prepare, implement and monitor a facility specific Bear-human Conflict Management Plan. Adaptive management approach required.

1.1.1. Objective	1.1.2. Land Use/Activity	1.1.3. Example Target Groups	1.1.4. Strategies/Best Management Practices
		facilities)	
	Fish Harvest and Preparation Activities	<ul style="list-style-type: none"> • First Nations (e.g., food fishery, individual sales, commercial fishery) 	<ul style="list-style-type: none"> • Promote bear awareness and safety training to minimize bear-human interactions while harvesting and preparing fish in bear country. Audience should clearly understand how to prevent interactions with bears • For site-specific commercial fish harvest or fish preparation (e.g., smokehouses) operations prepare, implement and monitor a site specific Bear-human Conflict Management Plan. Adaptive management approach required.
	Park Lands (e.g., Provincial Parks)	<ul style="list-style-type: none"> • BC Parks 	<ul style="list-style-type: none"> • Prepare, implement and monitor a Park specific or SRMP area specific Bear-human Conflict Management Plan. Adaptive management approach required.
	Other recreation lands (e.g., recreation sites, trails, recreation reserves) ¹	<ul style="list-style-type: none"> • FLNRO - Recreation Sites and Trails BC 	<ul style="list-style-type: none"> • Prepare, implement and monitor a Recreation Site specific or SRMP area specific Bear-human Conflict Management Plan. Adaptive management approach required. Note: some Recreation Sites will not be suitable for use as a user maintained site based on risks of bear-human interactions.

¹ Sites may be managed in partnership agreements with recreation groups, community organizations, First Nations, private citizens, local governments and forest companies.

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Videos

- Staying Safe in Bear Country: a behavioral-based approach to reducing risk.* 2001. Safety in Bear Country Society. Produced by Wild Eye Productions, Atlin, B.C. in association with AV Action Yukon Ltd.
- Working in Bear Country: for industrial managers, supervisors and workers.* 2001. Safety in Bear Country Society. Produced by Wild Eye Productions, Atlin, B.C. in association with AV Action Yukon Ltd.
- Living in Bear Country.* 2005. Safety in Bear Country Society. Produced by Wild Eye Productions, Atlin, B.C. in association with AV Action Yukon Ltd.

DVDs or videos can be purchased from Distribution Access Ltd.

Web Site: www.distributionaccess.com
 Email: sales@distributionaccess.com
 Phone: 1-888-440-4640

Websites

B.C. Ministry of Forests, Lands and Natural Resource Operations
<http://www.env.gov.bc.ca/wld/bearsmart>

- Bear Smart brochure
- Bear Smart Community Program background report
- Who's who: know your bears brochure
- Safety guide to bears at your home brochure
- Safety guide to bears in the wild brochure
- Don't feed garbage to bears brochure

B.C. Conservation Foundation Bear Aware program - <http://www.bearaware.bc.ca/>

United States Department of Agriculture Forest Service

<http://www.fs.fed.us/r1/wildlife/igbc>

- IGBC bear resistant certification report: includes information on distributors of bear resistant containers for hiking, insulated cooler, grain and food storage containers, panniers, boxes for storage of food in the front country and equipment for hanging food
- Bear safety information
- Pepper spray information

International Association for Bear Research and Management (IBA)

<http://www.bearbiology.com>

- Descriptions of bear species of the world
- URSUS – scientific journal of the IBA
- International Bear News – IBA newsletter

Haul-All

<http://www.haulall.com>

(click on Containers and then click Bear Proof Containers)

Bear resistant garbage and food storage containers

Margo Supplies

<http://www.margosupplies.com>

- bear proof electric fencing materials
- bear deterrents

Living with Wildlife Foundation

http://www.lwwf.org/Living%20with%20Predators_resource_guides.htm

Living with Predators Resource Guides.

Garcia Machine

<http://www.wildernessdining.com/shopbybrand-garciamachine.html>

Bear resistant canister that can be used for backpacking

Appendix E: Public Review Summary

RESPONDENT	COMMENT	FLNRO RESPONSE
Public	Section E & Table 11 need landscape layout. Use 'next section' break	This was done.
District Skeena-Stikine	What about Nisga'a	Nisga'a hired LGL for technical review of Cranberry. Input was included. See FN consultation files.
Public	<p>Public access to wildlife; open to interpretation. Other options to control harvest: horn antler req's, varied or shortened GOS, LEH or combination of LEH/GOS, conditions applied to the Guide outfitter license.</p> <p>Access restrictions should be applied to all users equally.</p> <p>Plan covers moose habitat problems.</p> <p>Predator management needed to recover and maintain ungulate populations: reduce restriction on hunting of predators, increase bag limits, promote and use registered trapper, allow BC residents to trap.</p> <p>Agree that grizzly bear hunting not be curtailed and will be managed to provide sustainable hunting opportunities based on science.</p>	Directed concerns re populations and hunting reg's to Fish and Wildlife Section of FLNRO.
Association of Mineral Exploration BC (AMEBC)	<p>Contain significant restrictive measures.</p> <p>Future amendment and treaty settlement lands may add to land restrictions.</p> <p>Allocation of Gitanyow Lake Reserve for Gitanyow management of cultural heritage resources may impose add'l restrictions for float plane access that facilitate mineral exploration in adjacent areas.</p> <p>Objectives lacking for minerals, coal, oil and gas</p> <p>Missing comment on mineral potential or known mineral occurrences</p> <p>Missing socio-economic studies</p> <p>AME BC is supportive of plan</p>	Informed AMEBC that plan focused on timber. Resource management direction for cultural heritage sites will not be made legal. Socio-economic assessment (SEA) provided to AMEBC.
Licensee	<p>Haven't determined impacts on operations, other than not being able to access an asset.</p> <p>Request assistance in assessing impact.</p> <p>Have been following GLUP, but Gitanyow want</p>	Approved blocks are not subject to the SRMP; developed blocks not under permit at SRMP approval will be subject to

RESPONDENT	COMMENT	FLNRO RESPONSE
	<p>modification or no harvest for many areas proposing to harvest.</p> <p>Unsuccessful in working with Gitanyow for approved permit and for developed blocks not yet approved.</p>	<p>the SRMP. Directed to website with shape files for Cranberry.</p>
<p>Recreation, Sites and Trails BC</p>	<p>Request to include recreation information (as provided) into the plan</p>	<p>Information will be incorporated into final plan.</p>
<p>FLNRO, Ecosystems</p>	<p>3.2 Target should be 100%</p> <p>Table referenced should be table 4, not 3.</p> <p>Point 2 of <i>Rationale for Amending the Ecosystem Network</i> tables should read “proposed” cutblocks “that have had substantial planning investment” = Cat. A block protection. If there were old cutblocks within EN that had been harvested years ago, the way it is written would allow licensees to harvest them in future.</p> <p>Pine Mushroom objective only attainable if sites are mapped</p> <p>Moose- “The plan area is noted for deep snow conditions...” should be removed.</p> <p>Goal statements - replace “capable of sustaining hunter harvest” with “capable of sustaining a viable population</p> <p>Grizzly Bear-Edit 1.1 so that “except for the following cases” to be at end of sentence.</p> <p>2.6.2 Cultural Heritage Resources-space b/w “legislation” & “and”.</p> <p>Appendix D-Tables D-1, D-2 & Literature Cited, as per Nass South SRMP, should be included.</p>	<p>Recommended change has been incorporated.</p> <p>Approved blocks can be harvested to the edge of the approved harvest area, even if it falls within the EN. Once you log and do silvi on the block the EN boundary is intact and new blocks will not be approved unless they meet the other criteria. This would not apply in the future as the block would not have prior approval.</p> <p>Surplus base funding has been allocated to completion of the pine mushroom inventory this fiscal.</p> <p>This sentence was removed.</p> <p>Recommended changes have been incorporated</p>
<p>Licensee</p>	<p>Extensive list of comments, some editorial, others more substantive. Major concern with not being involved in process and impact on timber supply. Other concern is not being allowed to harvest in Water Management Units using roaded harvesting</p>	<p>Editorial comments were incorporated where possible.</p> <p>Change to WMU made.</p>

RESPONDENT	COMMENT	FLNRO RESPONSE
	<p>systems (effectively no harvesting). Suggest changing to “no new roads” in WMU’s, and increase in operating costs.</p> <p>Summary:</p> <ul style="list-style-type: none"> • P. 2 reference to foreword seems incorrect and alternative reference suggested • pp. 11-12 – BCTS discussion has some minor inaccuracies. Suggested wording provided. • P. 20 Measure / Indicator typo on spelling of erodible • P. 22 Measure / Indicator 3.2 reference to Table 3 should be Table 4. Target should be 100 % (not 0). • P. 25 Note with Table 3 may no longer be relevant. Suggest delete. • P. 34 Measure / Indicator 5.2 suggest add ‘or natural causes’ to sentence. • P. 38 Table 7 reference to ICHmc2 appears incorrect and is believed it should be ICHmc1. • P. 39 Table 9 reference to Nass South is not relevant and can be removed. • P. 50 Measure / Indicator 1.1 suggest re-wording to improve clarity (re-order sentence). • P. 51 suggest define timber supply impact as THLB impact. • P. 53 Table 10 suggest add ‘Non-forested’ to distinguish these habitat types from the others, as necessary for Measure / Indicator 2.2 • P. 70 Measure / Indicator 1.1 suggest re-wording to improve clarity as per our understanding of the intent. Consider also for p. 72 if same Measure / Indicator is to be added to this section as well. 	<p>Other concerns that do not change the intent of the resource management direction have been incorporated.</p>
Licensee	Verbal comment - Unable to determine impacts to operations due to no capacity and staff to undertake analysis	Provided references to assist in assessing impact.
FLNRO Ab Affairs	Cedar reserves – remove “management”	No suitable alternatives, therefore no change made
FLNRO, Nanaimo - visuals	VEG definition incorrect-suggest changing term to “Greened-up”.	Recommended change has been incorporated.
Public	<p>Change “balsam fir” to “subalpine fir”.</p> <p>2.1.2 water, obj 1-should state “should be”.</p> <p>2.1.2 water, obj 3.0, measure 3.2 target should state 100% (not 0).</p>	Recommended changes have been incorporated, except for the Ecosystem Network.

RESPONDENT	COMMENT	FLNRO RESPONSE
	<p>Delete note re regional hydrologist.</p> <p>Plan implementation -add effectiveness monitoring.</p> <p>Need to clarify that the Ecosystem Network extends to the alpine.</p>	
Public	<p>Want to have sustainable hunting opportunities.</p> <p>Access restriction, particularly road de-activation.</p> <p>B.C. resident hunters place high value on moose meat, habitat and population management.</p> <p>Moose recovery plan is needed, not road de-activation.</p> <p>Inaccurate statement about decline in fish stocks.</p> <p>Bull trout information missing.</p> <p>A non-native perspective needs to be included to supplement the Gitanyow and Nisga'a perspectives.</p> <p>Declaration that Gitanyow have right to exclusive use and occupation is not supported or recognized by Northwest Fish and Wildlife Conservation Association.</p>	<p>Plan goal includes, "To provide for a sustainable harvest of big game species and furbearers"</p> <p>In order to protect the natural resources, road de-activation in some areas will need to occur. Existing access points and campsites will be maintained as much as possible.</p> <p>Added that B.C. resident hunters also place a high value on moose meat, habitat and pop'n mgmt.</p> <p>Moose recovery plan potentially for future; road de-activation is current tool available.</p> <p>Deleted statement, "Due to a variety of reasons, including damage to water quality, spawning and rearing habitat from road construction and timber harvesting, fish stocks have declined".</p> <p>Deleted para re south coast fish stocks.</p> <p>Added info provided on bull trout re fishing restrictions for the recreational fishery.</p>

Appendix F: Cranberry SRMP Timber Supply Analysis Data Package

The Cranberry SRMP data package provides details on assumptions used in the timber supply analysis. Specifically, it describes:

- criteria used in defining the timber harvesting land base
- management zones and objectives
- miscellaneous modeling assumptions

The first two of these items are subdivided into the three scenarios that were analyzed:

1. FRPA Benchmark Scenario – current legal requirements under FRPA
2. Current Management Scenario – current management commitments in Forest Stewardship Plans that are incremental to the legal requirements of FRPA
3. Cranberry SRMP Scenario – additional requirements from the Cranberry SRMP, incremental to Current Management Scenario

Note that criteria may be specified separately for the Cranberry and Kispiox. Where an area is not specified, the criteria apply to the whole plan area. All netdowns are 100% except where specified differently.

FRPA Benchmark Scenario

Category	Criteria	Notes
non-Crown	<ul style="list-style-type: none"> • tenure_type is not null and <> 'PARKS' • treat_lnds is not null • tsa is null • trans_line = 'Y' 	<ul style="list-style-type: none"> • non-biodiversity ownerships • proposed treaty settlement areas • 3 ha has no TSA • transmission line
non-productive	<ul style="list-style-type: none"> • np_code <> 00 • road_buff = 'Y' 	<ul style="list-style-type: none"> • type identity is not available. Some np_code is null, but is vegetated. Also, this catches some non commercial. • current roads are NP
non-commercial	<ul style="list-style-type: none"> • fmlb = 'N' or fmlb is null or spec_cd_1 is null or site_index is null or 0 	<ul style="list-style-type: none"> • type_identity is not available. All NCBR and NSR is in fmlb, assume it has all been reclassified with species, site index, etc.
Parks	<ul style="list-style-type: none"> • tenure_type = 'PARKS' 	<ul style="list-style-type: none"> • ownerships contributing to biodiversity
fans and floodplains	<ul style="list-style-type: none"> • alluv_fans = 'Y' • pmgt_zn = 'R' 	<ul style="list-style-type: none"> • fans • floodplain reserve zones
ESA	<ul style="list-style-type: none"> • esa_1 contains 'A' • esa_1 contains 'S' and slp_grp is not null • soil_eros is not null • stability = 'V' 	<ul style="list-style-type: none"> • Ea avalanche • Es1 on steep slopes only • soil erosion H and VH • TSM class V
inoperable	<ul style="list-style-type: none"> • git_op_sm is null 	<ul style="list-style-type: none"> • Philpot operability - ignore HMM

Category	Criteria	Notes
low site	<p>Cranberry:</p> <ul style="list-style-type: none"> • hemlock or cedar leading and site_index < 9 • balsam leading and site_index < 8.8 • spruce leading and site_index < 10.0 • pine leading and site_index < 11.0 • deciduous leading and site_index < 18 <p>Kispiox:</p> <ul style="list-style-type: none"> • cedar leading and site_index < 9 • hemlock leading and site_index < 8 • balsam leading and site_index < 8 • spruce leading and site_index < 7.5 • pine leading and site_index < 7.5 • AC-coniferous (itg=35) and site_index < 6 	<ul style="list-style-type: none"> • from 1997 Cranberry TSAR • from HMM criteria used in 2007 Kispiox TSR.
problem forest types	<p>Cranberry:</p> <ul style="list-style-type: none"> • non-pine coniferous leading and proj_age_1 > 140 and height < 19.5 • pine leading and proj_age_1 > 100 and proj_ht_1 < 19.5 • spec_cd_1 in ('AT','E','EP') and proj_age_1 > 40 <p>Kispiox:</p> <ul style="list-style-type: none"> • itg > 35 or au = 'X' 	<ul style="list-style-type: none"> • ignore pine stocking problems (no stocking class attributes) • old deciduous, except AC • deciduous except AcConif
wildlife habitat	<ul style="list-style-type: none"> • mountain goat: goat_uwr = 'Y' • moose: no reductions • mule deer: no reductions 	<ul style="list-style-type: none"> • ignore the goat buffer → management scenario • grizzly bear habitat addressed under Current Management
rare & endangered plant communities	<ul style="list-style-type: none"> • phm_status = 'RED' 100% • phm_status = 'BLUE' 70% 	<ul style="list-style-type: none"> • from Spatial Data Requirements
specific geographic areas	<ul style="list-style-type: none"> • mill_sa like 'Cedar%' or "Reserve%" • nl_ogma is not null 	<ul style="list-style-type: none"> • Mill Creek Sensitive Area – protection and reserve zones • Kispiox legal OGMA and Cranberry non-legal OGMA. Phase in-of old seral in Cranberry not required because all operable area is in Intermediate BEO LU.
riparian	<ul style="list-style-type: none"> • riparian is not null • 10 m RRZ on S4 streams in Nangeese watershed in Upper Kispiox SMZ 	<ul style="list-style-type: none"> • RMZs converted to an equivalent RRZ. • RMZ for S4 represents effective width, not actual width, but can use an alternate approach.
WTP	<p>Cranberry: 5.0%</p> <p>Kispiox: 10.3%</p>	<ul style="list-style-type: none"> • Cranberry rationale (2.5+2.5) • Kispiox analysis report
future roads	<p>Cranberry: 4.4% for proj_age_1 > 34 years</p> <p>Kispiox: 4.4% for proj_age_1 > 32 years</p>	<ul style="list-style-type: none"> • adjusted from 20 years in 1997 • adjusted from 26 years in 2005

Current Management Scenario (incremental to FRPA Benchmark Scenario)

Category	Criteria	Notes
wildlife habitat	<ul style="list-style-type: none"> grizzly bear: griz_frpa = 'YES' 	<ul style="list-style-type: none"> replaces management requirements in FRPA Benchmark

Cranberry SRMP Scenario (incremental to Current Management Scenario)

Category	Criteria	Notes
watersheds	<ul style="list-style-type: none"> git_10link = 'Y' 	<ul style="list-style-type: none"> 10 Link Creek expanded area
water mgmt units	<ul style="list-style-type: none"> wmu_name in 'WMU#1', 'WMU#2', 'WMU#3', 'WMU#4' 	<ul style="list-style-type: none"> do not remove ' WMU#3-Poss Oper'
core ecosystem network	<ul style="list-style-type: none"> econet_fan = 'Y' 100% ecobuff = 'Y' 70% 	<ul style="list-style-type: none"> core area buffer
wildlife	<ul style="list-style-type: none"> ghawk_nest = 'Y' goat_buff = 'Y' griz_hv <> 0 and griz_frpa is null wild_patch is not null 100% 	<ul style="list-style-type: none"> goshawk nests goat UWR buffers high value GB habitat (class 1, 2,3) not in FRPA wildlife habitat patches
cultural heritage features	<ul style="list-style-type: none"> cultrail = 'Y' kitcool = 'Y' 	<ul style="list-style-type: none"> grease trail Kitwancool Lake reserve
riparian	<ul style="list-style-type: none"> full retention of all RMZ in Upper Kispiox SMZ 	<ul style="list-style-type: none"> represents hydroriparian zone
WTP	<ul style="list-style-type: none"> Cranberry: 6.0% 	<ul style="list-style-type: none"> assume half of SRMP target can be met outside THLB Kispiox already 10.3

FRPA Benchmark Scenario

Resource Objective	Target and Condition	Affected Land Base	Notes
Old seral	none		<ul style="list-style-type: none"> use OGMAs as land base netdown
Mature+old and early seral stages	as specified in Kispiox data package for Kispiox TSA only	CFLB by BEC variant by LU within Kispiox TSA only	<ul style="list-style-type: none"> No legal requirements for Cranberry. Sliver LUs are ignored – all have < 20 ha in THLB: Kispiox, McCully, Skeena Crossing, Skeena West, <null>.
VQO	R: max 5% < 5 m PR: max 15% < 5 m M: max 25% < 5 m	CFLB by VQO type by LU	<ul style="list-style-type: none"> 5 m height = 20 years
grizzly bear habitat	Cranberry: <ul style="list-style-type: none"> min 10% > 100 years max 30% < 20 years Kispiox <ul style="list-style-type: none"> general 1% reduction 	CFLB where grizz_hv in (1,2,3) and git_op_sm = 'Y'	<ul style="list-style-type: none"> polygons with griz_frpa = 'YES' already netted out. no legal requirements for Kispiox implement as a volume reduction in the Woodstock outputs
Community watersheds	max 20.4% < 6 m	Ten Link Creek CFLB	<ul style="list-style-type: none"> 6 m height = 30 years might have to recalculate max% based on new CFLB
Pine mushroom habitat	Kispiox TSA: <ul style="list-style-type: none"> min 60% > 80 years 	CFLB where mshm_name is not null or ppine_hab2 = 'Y'	<ul style="list-style-type: none"> Combine 2 sets of mapping. Target from TSR.
IRM	max 33% < 3 m	THLB by LU	<ul style="list-style-type: none"> 3 m height = 10 years

Current Management Scenario (incremental to FRPA Benchmark Scenario)

Resource Objective	Target and Condition	Affected Land Base	Notes
mule deer winter range	min 6% > 150 years	CFLB in deer winter range	<ul style="list-style-type: none"> only exists in Kispiox.
grizzly bear habitat			<ul style="list-style-type: none"> remove management requirements from FRPA Benchmark and replace with land base reduction in Current Management

Cranberry SRMP Scenario (incremental to Current Management Scenario)

Resource Objective	Target and Condition	Affected Land Base	Notes
Old seral in Upper Kispiox SMZ	apply SRMP targets based on High BEO	CFLB by BEC variant in Upper Kispiox SMZ	<ul style="list-style-type: none"> • about 2/3 of Upper Kispiox SMZ is inoperable or in water management unit, so effect should be insignificant • OGMAs apply in rest of SRMP area
mature+old and early seral stages	<p>Cranberry apply SRMP targets outside of Upper Kispiox SMZ.</p> <p>Upper Kispiox SMZ</p> <ul style="list-style-type: none"> • apply SRMP targets based on high BEO 	<p>CFLB by BEC variant by LU outside Upper Kispiox SMZ</p> <p>CFLB by BEC variant in Upper Kispiox SMZ</p>	<ul style="list-style-type: none"> • not required in FRPA base case. • only ICHmc2 has THLB
Pine mushroom habitat	<p>apply everywhere and replace target with:</p> <ul style="list-style-type: none"> • min 50% between 80 and 200 years 	CFLB where mshm_name is not null or ppine_hab2 = 'Y'	<ul style="list-style-type: none"> •
Community watershed	None		<ul style="list-style-type: none"> • replace management requirements from FRPA Benchmark with land base removal in SRMP Scenario
Wildlife	<ul style="list-style-type: none"> • moose: min 30% mature or old 	CFLB where moose_rate = high or moderate	<ul style="list-style-type: none"> • most winter range is in ICH which has mature+old age of 101+
Cedar management areas	even-flow volume harvest from this area	THLB where cedar is not null	proxy for even-flow cedar harvest volume

All Scenarios

Item	Approach	Notes
analysis units	<p>Cranberry: use TSR analysis units</p> <p>Kispiox: aggregate TSR analysis units by leading species and site class to eliminate HMM component</p>	<ul style="list-style-type: none"> different analysis units for Cranberry and Kispiox Kispiox - HMM data not available so combine AUs to remove HMM code. Russ Hendry did this work.
minimum harvestable ages	<p>Cranberry AUs: use TSR MHA</p> <p>Kispiox aggregated AUs: average the TSR MHA by leading species and site class</p>	<ul style="list-style-type: none"> different MHA for Cranberry and Kispiox MHA averaged for Kispiox AUs with same leading species and site class (i.e., no HMM code). See "yield tables" below.
unsalvaged losses	<p>Prorate TSR values to current THLB of SRMP area. => 738 rounded to 750.</p>	<ul style="list-style-type: none"> THLB: Cranberry 17,898 ha; Kispiox 13,324 ha Cranberry UL: 397 m³/year for 32,832 ha of THLB => 216 Kispiox UL: 12,840 m³/year for 327,837 ha of THLB => 522
harvest flow	<p>Maintain current AAC as long as possible, subject to rules below. => 99,672 rounded to 99,700</p> <p>Maximum decline 10% per decade.</p> <p>Maximize long-term even-flow harvest level with stable growing stock for last 5 decades</p>	<ul style="list-style-type: none"> "Current AAC" is the sum of the current AAC prorated to the SRMP THLB for each TSA. THLB: Cranberry 17,898 ha; Kispiox 13,324 ha Cranberry AAC: 110,000 m³ for 32,832 ha of THLB, => 59,965 Kispiox AAC: 977,000 m³/year for 327,837 ha of THLB => 39,707. Kispiox partition not an issue.
NSR	<p>No work required.</p>	<ul style="list-style-type: none"> VRI data set adjusted for all depletions and NSR
yield tables	<p>Cranberry AUs: use TSR yield tables</p> <p>Kispiox aggregated AUs: average the TSR yield tables by leading species and site class</p>	<ul style="list-style-type: none"> accounts for utilization standards, deciduous volume exclusions, silviculture systems, and regeneration assumptions 2 year regen delay is ignored for Cranberry because it is implemented differently in Woodstock than in FSSIM. 2 year regen delay is included in Kispiox yield tables, which were built for Woodstock. yield tables are averaged for Kispiox AUs with same leading species and site class (i.e., no HMM code). Russ Hendry did this work.
application of managed stand yield tables	<p>Cranberry: age <= 34 years.</p> <p>Kispiox: age <= 32 years</p>	<ul style="list-style-type: none"> adapted from TSR consistent with future roads netdown 1997 Cranberry 10-20 year 2005 Kispiox 26 years
Dothistroma	<p>Ignore</p>	<p>Dothistroma mapping not included in data set. Cannot implement AU adjustments. Should not significantly affect impact assessment.</p>

Appendix G: Cranberry SRMP Timber Supply Analysis Report

The following is a summary of results from the timber supply analysis of the Cranberry SRMP:

1. Scenarios

- The FRPA Benchmark represents the current legal requirements for forest licensees.
- Current Management represents the management requirements currently being applied by forest licensees, as specified in their Forest Stewardship Plans. Current Management has an incremental impact compared with the FRPA Benchmark.
- SRMP Scenario represents all of the requirements of the Cranberry SRMP document. Impacts are shown relative to the FRPA Benchmark and Current Management.

2. First Decade Harvest Level

- For a Timber Supply Review (TSR) analysis for a Timber Supply Area (TSA), one of the policies that defines the shape of the harvest forecast graph is to “maintain current allowable annual cut (AAC) as long as possible” without compromising the long-term harvest level. The Cranberry SRMP area is smaller than a TSA so it does not have a “current AAC”. Thus, the first decade harvest level in the Cranberry SRMP analysis is the maximum possible.
- The Cranberry SRMP area consists of parts of the former Cranberry and Kispiox TSAs. Prorating the AAC for these TSAs produces a theoretical “current AAC” of 99,700 m³ (see Appendix E: Cranberry SRMP Timber Supply Analysis Data Package, for details). This is lower than any of the first decade harvest levels shown in the results, which means that the SRMP will not affect the short-term harvest level.
- The first decade harvest level appears to increase (albeit by very small amounts) when comparing the FRPA Benchmark to the Current Management scenario and the SRMP Scenario. Each scenario removes area from the timber harvesting land base (THLB). Since many of the management requirements can be met from the THLB, reducing the size of the THLB essentially reduces the level of constraint on the remaining THLB. It seems that reducing the level of constraint on the remaining THLB outweighs the effect of removing land from the THLB.

3. Timber Harvesting Land Base (THLB)

- The reduction in THLB is greater than the reduction in long-term harvest level. This is because many of the THLB reductions occur on low productivity areas or on highly constrained areas, such as riparian areas.

Table 11. Cranberry SRMP Timber Supply Impacts

Scenario	First Decade Harvest Level			Long term Harvest Level			Timber Harvesting Land Base		
	m ³ /year	% Change from FRPA Benchmark	% Change from previous scenario	m ³ /year	% Change from FRPA Benchmark	% Change from previous scenario	hectares	% Change from FRPA Benchmark	% Change from previous scenario
FRPA Benchmark	127,434			110,022			48,131		
Current Management	127,831	0.3%	0.3%	104,488	-5.0%	-5.0%	46,366	-3.7%	-3.7%
SRMP Scenario	129,608	1.7%	1.4%	94,484	-14.1%	-9.6%	35,255	-26.8%	-24.0%

