

Dease Liard Sustainable Resource Management Plan

Background Document



January, 2004

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List of Acronyms

AAC	Annual allowable cut
AOA	Archaeological Overview Assessment
ATV	All terrain vehicle
BEC	Biogeoclimatic ecosystem classification
BWBS	Boreal Black and White Spruce biogeoclimatic zone
CDC	Conservation Data Centre
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPAWS	Canadian Parks and Wilderness Society
CWD	Coarse woody debris
DFO	Department of Fisheries and Oceans (now Fisheries and Oceans Canada)
DLAA	Dease-Liard Area Assessment
DLAAP	Dease-Liard Area Assessment Process
DLPA	Dease-Liard planning area
DLSRMP	Dease-Liard Sustainable Resource Management Plan
ECA	Equivalent clearcut area
FPC	Forest Practices Code
FRC	Forest Resources Council
FRPA	Forest and Range Practices Act
FSP	Forest Stewardship Plan
GIS	Geographic information system
HLP	Higher level plan
IAMC	Inter Agency Management Committee
IMA	Interim Measures Agreement
IWMS	Identified wildlife management strategy
LLP	Landscape level plan
LRMP	Land and resource management plan
LUP	Land use plan
LWBC	Land and Water British Columbia
MELP	Ministry of Environment, Lands and Parks ¹
MEM	Ministry of Energy and Mines
MOF	Ministry of Forests
MRI	Mean return interval
MSRM	Ministry of Sustainable Resource Management
WLAP	Ministry of Water, Land, and Air Protection
NDT	Natural disturbance type
PAS	Protected Areas Strategy
RPAT	Regional protected areas team
SRM	Sustainable resource management
SRMP	Sustainable Resource Management Plan
SWB	Spruce Willow Birch biogeoclimatic zone
THLB	Timber harvest land base
TNO	Treaty Negotiations Office
TSA	Timber supply area
TSB	Timber supply block
TSR	Timber supply review

¹ In June of 2001 the Ministry of Environment, Lands and Parks was replaced by the Ministry of Water, Land and Air Protection and the Ministry of Sustainable Resource Management.

TUS	Traditional use study
VLI	Visual Landscape Inventory
VQO	Visual quality objective
WTP	Wildlife tree patch

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 (AAC)	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 AACs for timber supply areas (TSA) and tree farm licences (TFLs) 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 zones (BEC)	A system of ecological classification based primarily on climate, soils, and vegetation that divide 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	Sensitive or vulnerable species as identified by the Ministry of Water, Land and Air Protection. Blue-listed species are considered to be vulnerable and "at risk" but not yet endangered or threatened. Populations of these species may not be declining but their habitat or other requirements are such that they are sensitive to disturbance.
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 to be critically important for sustaining a population and where development may cause an unacceptable decline in the population.
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.

Ecological reserve	Public land reserved for ecological purposes under the Ecological Reserve Act including areas: (a) suitable for scientific research and educational purposes associated with studies in productivity and other aspects of the natural environment; (b) that are representative examples of natural ecosystems within the province; (c) where rare or endangered native plants or animals in their natural habitat may be preserved; and (d) that contain unique and rare examples of botanical, zoological or geological phenomena.
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.
Fragmentation	Occurs when large continuous forest patches are converted into one or more smaller patches surrounded by areas disturbed naturally or by human activities.
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.
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).
Red-listed species	Threatened or endangered species identified by the Ministry of Water, Land and Air Protection. The taxa on the red list are either extirpated, endangered, threatened or are being considered for such status. Any indigenous taxa (species or sub-species) threatened with imminent extinction or extirpation throughout all or a significant portion of its range in BC is endangered. Threatened taxa are those indigenous species or sub-species that are likely to become endangered in BC if conditions are not altered.

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.
Scenic area	Any visually sensitive area of scenic landscape identified through a visual landscape inventory or planning process carried out or approved by a district manager.
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.
Stand initiating disturbance	A natural disturbance event, such as wildfire, wind, landslides, and avalanches that significantly alter an ecosystem. In most cases, there is considerable mortality of plant species, some degree of site disturbance and the initiation of successional processes that will form a new plant community with a different structure and likely a different composition than its predecessor.
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 Supply Area (TSA)	An integrated resource management unit established in accordance with Section 6 of the <i>Forest Act</i> . TSAs were originally defined by an established pattern on wood flow from management units to the primary timber-using industries. They are the primary unit for allowable annual cut determinations. A Timber Supply Area may be subdivided into a number of Timber Supply Blocks.
Tourism capability	Assesses whether the necessary biophysical features are present to support a given activity
Visual Landscape Inventory (VLI)	An inventory that identifies visible areas that have known or potential scenic value as seen from selected viewpoints, such as towns, parks, recreation sites and highway and river corridors. .
Visual Quality Objectives (VQO)	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.
Wildlife tree	A tree or group of trees that are 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.

1. Introduction

1.1 Plan Objectives

The main objectives of the development of the Dease-Liard Sustainable Resource Management Plan are:

- to create conditions for apportionment of timber within the Dease-Liard Timber Supply Block;
- where availability of information prevents establishment of site-specific, detailed objectives develop broad objectives and strategies to direct timber harvesting operations;
- where sufficient information is available, develop objectives and strategies that are site-specific, result-based, set in economic and ecosystem context and operationally feasible;
- to identify and assess potential impacts of timber harvesting on other resource values (i.e., recreation, visual quality, biodiversity, wildlife, fisheries, cultural heritage, and community use);
- to identify information gaps and the need for future research;
- to provide greater certainty of development potential of the landbase within the plan area by reducing and /or preventing conflict on the ground;
- to promote economic opportunities; and
- to provide certainty for investors and communities.

1.2 Background

Resource management in the Dease-Liard plan area is presently not guided by an approved land use plan (LUP). Land and Resource Management Plans (LRMPs) have been completed for two areas immediately adjacent to the Dease-Liard planning area (DLPA): the Cassiar-Iskut-Stikine LRMP and the Fort Nelson LRMP.

The need to undertake some level of resources assessment within the Dease-Liard area was identified in the 1997 timber apportionment announcement. The Minister of the Ministry of Forests did not apportion the Dease-Liard Timber Supply Block, pending further consultation with local communities, development strategies for timber, and establishing training opportunities for local people. As a result, in 1999, the Ministry of Forest (MOF), the former Ministry of Environment Lands and Parks (MELP) and the Kaska Dena First Nation initiated the Dease-Liard Area Assessment Process (DLAAP).

The following were the intended outcomes of the process:

- to provide technical evaluation of timber operability, recreation, visual quality, biodiversity, wildlife and fish, and other resource values;
- to rank areas by their sensitivity for future timber opportunities;
- to identify information gaps and further technical studies;
- to provide the district manager with timber harvesting strategies and forest practices options;
- to provide direction for future tenure opportunities and meet the Minister's requirement for further consultation with local communities prior to apportioning the Dease-Liard Timber Supply Block.

The DLAA process was still ongoing in June 2001 when the Ministry of Sustainable Resource Management (MSRM) was created as the primary provincial agency responsible for land-use

planning and co-ordination of the land and water policies necessary for the development of our natural resources. In February 2002 MSRM released the 2002/03-2004/05 Service Plan which provided direction to complete priority LRMPs (Central Coast, Morice, North Coast, Sea-to-Sky and Queen Charlotte Islands) and landscape level plans (LLP) with a focus on sustainable economic development and maintaining biodiversity. The Service Plan also identified the remaining areas for which the LRMPs will not be completed and those are: Dease-Liard, Atlin-Taku (based on 2003/04-2005/06 MSRM Service Plan this area is under review), Chilliwack, Merritt and Nass.

Each MSRM region was tasked to prepare its Regional Service Plans consistent with the Provincial and Divisional Service Plans. MSRM Skeena Region assessed the situation and identified the planning priorities. Completion of a LLP for Dease-Liard area was identified as priority A. The factors that led to this decision were:

- in August of 1997 apportionment announcement, the Minister of the Ministry of Forests (MOF) did not apportion the Dease-Liard Timber Supply Block, pending further consultation with local communities, development strategies for timber, and establishing training opportunities for local people;
- in April of 1999, the Kaska Dena Council indicated to the Ministry of Forests' staff that they intend to pursue some form of tenure opportunity in the Dease-Liard Timber Supply Block and that provided positive economic climate. In addition, under the Interim Measure Agreement that was signed between the Kaska and the Province (December 2000), MOF made commitment to work with the Kaska to identify a tenure opportunity in the Dease-Liard Timber Supply Block;
- in 1999 MOF, the former Ministry of Environment Lands and Parks (MELP) and the Kaska Dena First Nation initiated the Dease-Liard Area Assessment process (DLAAP). The process was still ongoing, in the early summer of 2001, when the Ministry of Sustainable Resource Management was formed and given the mandate for strategic planning. Substantial amount of work was completed; and
- in the fall of 2001, MSRM reviewed the progress that had been made during the DLAAP, and decided that it would be possible to use that work as the basis for development of a Sustainable Resource Management Plan (SRMP).

Consistent with the original DLAAP, the Dease-Liard Sustainable Resource Management Plan (DLSRMP) will be finalized in partnership with the Kaska Dena First Nation. The Kaska Dena concerns and values have been identified in this document. The plan includes management direction to reflect those concerns and values. The Dease-Liard planning process built upon DLAAP and relevant portions of the Dease-Liard Area Assessment technical document, June 12, 2000, which was still under development, have been incorporated into the Dease-Liard SRMP.

1.3 MSRM Mandate, Principals and Organizational Values

The Ministry of Sustainable Resource Management is the primary provincial agency responsible for land-use planning and co-ordination of the land and water policies necessary for the development of our natural resources. It provides the leadership required to find the balance between economic development and environmental integrity, as well as providing key information about our natural resources. These functions are of critical importance in ensuring improvement in both British Columbia's ability to attract private investment and the ability of our industries to compete in global markets.

The establishment of this ministry represents a substantial change in the way the government will deliver its land-use planning and resource inventory information services to British Columbians.

As a result of integrating and streamlining functions of several ministries and agencies, each will be able to provide clients with access to all relevant planning, data and information about Crown land and resources through one access point.

The ministry will also provide the Land Reserve Commission and Land and Water BC with strategic direction to ensure that decisions about Crown land are sustainable, accountable and responsible. Partnerships with First Nations, industry, academia and societies will be established to explore other, more efficient ways of delivering the ministry's services.

The ministry is committed to the following principals to guide its activities and delivery of public services:

- sustainability;
- integrated resource management;
- science-based decision-making;
- shared stewardship;
- public and client consultation; and
- intergovernmental harmonization.

The ministry is committed to the following values regarding organization and staff behaviour:

- professionalism in all interactions with client and staff;
- high quality client service that is streamlined for efficiency and timelines;
- respect for the opinions and values of others;
- creativity and innovation in achieving the ministry's goals and objectives;
- responsive management in a changing environment; and
- continual improvement in performance, and accountability to the people of British Columbia.

Taken together, the actions of the ministry will produce greater certainty and improved decision-making that should yield increased economic and social benefits while maintaining environmental values.

1.4 SRM Planning and Plans Defined

Sustainable Resource Management (SRM) Planning is the new consolidated approach to planning at the landscape level on provincial Crown lands. SRM Planning will allow MSRM to implement land use plans, identify economic opportunities, design efficient, sustainable development and conserve environmental values.

SRM Planning replaces the current confusing array of landscape-level Crown land plans with a new comprehensive, flexible and efficient model that supports economic development, ecosystem management and watershed planning. SRM Planning must be tested against and consistent with LRMPs and Regional Land Use Plans where these exist.

SRM Planning must also be consistent with the following sustainability principals:

- *Accountability*- Setting performance-based standards and indicators and implementing mechanisms for compliance, auditing and reporting on progress towards sustainable resource management. An effective enforcement regime is a key part of accountability;
- *Certainty*- Making timely and clear resource management decisions with a predictable and understandable regulatory framework;

- *Competitiveness*- Ensuring that British Columbia remains internationally competitive by removing barriers to investment and promoting open trade;
- *Continuing improvement*- Learning from the past and looking for new and improved approaches to resource management;
- *Efficiency*- Maximizing the net benefit arising from the allocation, development and use of natural resources;
- *Innovation*- Encouraging innovative approaches, technologies and skills to ensure the sustainability of natural resources;
- *Integration*- Ensuring that resource management decisions integrate economic, environmental and social consideration for the benefit of present and future generations;
- *Science-based decision making*- Making justifiable decisions informed by science based information and risk assessment;
- *Shared responsibility*- Encourage co-operation among First Nations, federal, provincial and local governments, industry and non-governmental organizations in developing and implementing resource management policies; and
- *Transparency*- Establishing open and understandable decision-making process including consulting with key interests groups prior to making decisions. Transparency also includes the public release of monitoring and compliance records, and tracking of sustainability indicators.

The sustainability principals are not intended to measure operational decisions, but to be applied to significant policy and legislative initiatives.

Over time, SRM Planning will provide a vehicle for maintaining land use plans that have been completed or are soon to be finished and that establish broad provincial Crown land use zoning and objectives. The intent with SRM Planning is to move to larger landscape planning areas wherever possible rather than applying the previous concept of developing a plan for a single landscape unit. The volume of SRM Planning under way at any given time will depend on the willingness of partners to assume a leadership role and the availability of government planning resources.

The SRM Plan should be documented in a flexible format (contained in a three-ring binder) with some chapters common to all natural resources, such as the identification of values in the area, existing policy and planning direction and the information base and analysis. It may also have chapters that present consolidated information to help investigate economic opportunity or environmental assets. Most of the SRMPs will likely have chapters added over time. These deal with specific resource values or activities in some detail. For example, a significant portion of MSRMP's current focus has been on completing objectives for biodiversity conservation in areas where this is a priority. This focus will continue as an important and early chapter in the SRMP because it is a priority business need of the forest industry and an essential element of sustainable development.

Other values and activities that may be added to the SRMP include but are not limited to the following:

- agriculture;
- cultural and heritage resources;
- energy production including from alternative energy sources;
- fisheries habitat;
- public and commercial recreation;
- riparian management;

- settlement;
- sub-surface resource extraction;
- timber and botanical forest products;
- tourism;
- visual quality; and
- wildlife habitat.

SRM Planning, as a landscape-level process, produces objectives that will be site specific, result-based, set in an economic and ecosystem context and operationally relevant. The intent is to design objectives that explain the condition of the resource value in the landscape at specified times in the future. For example, this may include the following outputs:

- specific delineation of two-zone approach for mining;
- spatial confirmation of the Working Forest;
- identification of generalized areas or specific sites for commercial recreation opportunities and tenuring;
- spatial location and objectives for scenic areas and visual management;
- definition of specific stream reaches for permissible uses such as independent power producer;
- retention requirements for forest cover in specific ecological sub-zones;
- delineation of range and other wildlife habitat; and
- delineation of specific areas for agricultural land development opportunities.

The consolidated, clear direction provided by SRMP objectives is essential for defining the results by which the forest industry will be measured under the *Forest and Range Practices Act* (FRPA). In areas where objectives are incomplete, it is proposed that the new FRPA will establish “proxy” or interim objectives. These transitional proxy objectives apply until replaced by objectives developed through the SRMP.

Some of the most important MSRM roles in SRM Planning are:

- approving strategic objectives developed through SRMPs;
- providing key policy direction to manage the economic and environmental impact of SRM Planning;
- providing planning and analysis expertise based on partnership agreements;
- leading planning processes when necessary and no partners who are willing to play a lead role have been identified;
- defining standards for planning areas, data preparation, objectives and other plan outputs, and monitoring;
- developing analysis tools;
- monitoring; and
- ensuring that the accommodation of First Nations interests is considered.

1.5 Scope of Dease-Liard SRM Plan

The Dease-Liard SRMP addresses, to some extent, the following resource values: timber, wildlife, biodiversity, cultural heritage, visual quality, fisheries, riparian management and community use. Where availability of information prevented development of site-specific, detailed objectives, broad objectives and strategies have been developed. Where sufficient information was available objectives and strategies have been developed that are site-specific, result-based, set in an economic and ecosystem context and operationally feasible.

Biodiversity/Wildlife are addressed through coarse and fine filter management. The coarse filter management direction is based on the natural disturbance patterns that are representative of the plan area and it differs from the recommendations specified in the *Biodiversity Guidebook* and *Landscape Unit Planning Guide* under the *Forest Practices Code* (FPC). The plan provides direction for the management of:

- seral stage distribution;
- temporal and spatial distribution;
- old seral retention and representation;
- landscape connectivity;
- stand structure through wildlife tree retention;
- species composition; and
- riparian management.

The fine filter provides management direction for the management of:

- caribou;
- moose;
- grizzly bear;
- fur-bearers (marten, fisher, and wolverine);
- mountain goat;
- Stone's Sheep,
- Bull Trout; and
- other endangered wildlife & habitats.

The plan will provide strategic direction for timber harvesting operations. It includes:

- designation of a landscape unit (includes the entire plan area) and objectives for biodiversity; and
- designation of zones and objectives for the management of timber, wildlife, cultural heritage, visual quality, and community use.

1.6 The Process

1.6.1 Dease-Liard Area Assessment Process

1.6.1.1 Process overview

In the August 1997 apportionment, the Minister of the Ministry of Forests did not apportion the Dease-Liard Timber Supply Block, pending further consultation with local communities, development of timber strategies, including value added, and establishing training opportunities for local people. Consequentially, the DLAAP was initiated in 1999 as a joint effort of MOF, MOE (presently WLAP), and the Kaska Dena First Nation, who form the majority of the population in the plan area. The intent of the DLAAP was to provide direction for future tenure opportunities prior to the request to the Minister to approve the apportionment in the Dease-Liard Supply Block.

A technical working group was established to guide the process and complete the necessary information collection, analysis and product preparation. The roles and responsibilities of each participant in the technical team were identified.

The nine phases of the DLAAP were as follow:

Phase 1: Assemble Technical Working Group and Prepare Terms of Reference

- Start up meeting with Kaska Dena & Technical Working Group
- Determine First Nation participants (Kaska Dena, Teslin Tlingit, Tahltan First Nations)
- Identify Draft Assessment Area Boundary
- Identify Project Procedures and Products
- Prepare Draft Terms of Reference
- Begin to gather and organize information

Phase 2: Agree on Procedures/Products

- Define Boundary of Assessment Area
- Define Project Procedures and Products
- Approve Terms of Reference

Phase 3: First Information Meeting-Good Hope Lake

- Explain Process, Roles, Procedures/Products

Phase 4: Prepare Information

- Compile information/criteria, map overlays
- Review with Technical Working Group
- Prepare Distribution List

Phase 5: Prepare Pre-Draft of Information for Public Review

Phase 6: Review Period-2 Months

- Presentations to public interest groups and opportunities for meaningful input on resource values
- Prepare preliminary analysis

Phase 7: Prepare Draft Report and Maps

- Complete Analysis
- Incorporate Review Period comments where appropriate
- Present evaluations, recommendations

Phase 8: Review Period-2 Months

- Acquire input on evaluations and recommendations, complete consultations

Phase 9: Prepare Final Report/Recommendations and Maps

In June 2001, when (MSRM) was created as the primary provincial agency responsible for land-use planning, the DLAAP was close to the completion of Phase 5.

1.6.1.2 Public, Stakeholders, First Nations and Line Agency Involvement

During the process, meetings were held with a small group of the Kaska Dena who then took the information from these meetings back to the communities. As an outcome of these community consultations, suggestions were provided on the establishment of zone boundaries (see Map 15), and management direction to address concerns and values brought forward by the Kaska Dena. This information was captured in the draft Dease-Liard Area Assessment technical document, June 12, 2000.

Two review periods were anticipated to provide an opportunity for participation from the public, stakeholders and other government agencies. Consultation with the Kaska Dena would be according to the Interim Measures Agreement between the Kaska and MOF which was under development at the time. Meaningful consultation was to occur with the Tahltan and Teslin Tlingit First Nations.

1.6.2 Sustainable Resource Management Planning Process

1.6.2.1 Process overview

The SRM Planning process is generally a more technical, design-oriented process, not a consensus-based process such as previous LRMPs. It will be accomplished in partnership with the Kaska Dena First Nation and will accommodate the Kaska Dena interests. The process defers slightly from the landscape level planning process as recommended by the MSRM planning policies due to the following circumstances:

- a LRMP has not been completed for the plan area and consequently, social choice decisions have not been made. Some social decisions will be made during this process;
- there is no strategic direction to be followed; and
- this process is the continuation of the DLAA process and it builds upon that process.

Consistent with provincial direction, establishment of protected areas has not been considered. Areas having significant values that may require protection have been identified and concerns and values for these areas have been documented. While this process looks at resource values in terms of the effect from timber harvesting, other processes may occur at a later date to look at other Crown land uses such as protected areas and mining.

The key phases in the planning process are as follow:

Phase 1: Process Initiation

- assemble the planning team
- develop detailed work plan

Phase 1 Milestone: Detailed work plan completed.

Phase 2: Information Gathering

- summarize previous years work
- compile existing inventories

Phase 2 Milestone: Relevant information assembled and accessible to team members.

Phase 3: Plan Development

- review the history and work completed to date
- draft the plan and develop implementation, monitoring and reporting methodology
- obtain Kaska Dena agreement on the proposed draft plan

Phase 3 Milestone: Draft Sustainable Resource Management Plan Completed

Phase 4: Government, Key Stakeholders and First Nations Consultation

- present/provide the draft plan to the key stakeholders, affected First Nations and government agencies for their input
- revise the draft plan as appropriate
- obtain Kaska Dena agreement on the proposed revisions

Phase 4 Milestone: Revised Draft Sustainable Resource Management Plan Completed

Phase 5: Public Review

- implement 60 day public review period
- revise the draft plan as appropriate
- obtain Kaska Dena agreement on the proposed revisions

Phase 5 Milestone: Final Draft Sustainable Resource Management Plan Completed

Phase 6: Plan Approval

- review and approval of the final draft plan by the minister
- filing the order

Phase 6 Milestone: Sustainable Resource Management Plan Approved and Released

Phase 7: Data Warehousing

The primary task of Phase 7 is warehousing of the data sets used for the analysis during plan development.

1.6.2.2 Public, Stakeholders, First Nations and Line Agency Involvement

The Dease-Liard planning process is a partnership between MSRM and the Kaska Dena First Nation. As partners in the process, the Kaska Dena Council and the Kaska communities have an opportunity to be intensively involved in the development of the plan. Substantial amount of valuable traditional knowledge and information that was provided by the Kaska people was crucial, considering many gaps in the inventory information.

Consultations with the Tahltan and Teslin First Nations, key stakeholders (such as: guide outfitters and Canadian Parks and Wildlife Society (CPAWS)), line agencies (such as Ministry of Water Land and Air Protection (WLAP), Land and Water BC (LWBC), Ministry of Energy and Mines (MEM)), and local government will occur through official letters of consultation, meetings and/or presentations.

An opportunity for other stakeholders and the general public to review and comment on the final draft plan will be provided during a 60-day review and comment period. Open houses will be held in the communities of Dease Lake, Good Hope Lake, Lower Post, Teslin, and Watson Lake.

1.7 Dease-Liard Plan Area

1.7.1 Biophysical Setting

The Dease-Liard plan area (see Map 1) lies within the Dease-Liard Timber Supply Block of the Cassiar Timber Supply Area. It extends south-north, from the headwaters of Turnagin River and Dease Lake to the Yukon border and west-east from the Little Rancheria River to Tatsino Creek. The entire plan area falls within the Kaska Dena traditional territory. There is an overlap with the Tahltan First Nation traditional territory and Teslin Tlingit traditional territories (see Map 3). It includes the following landscape units: Little Rancheria River, Dease Lake, Middle Dease River, Dease River, Blue River, Upper Liard River, Lower Kechika River, Cry Lake, and Turnagin River (partially).

The topography of the area is predominately rolling terrain which is underlain by sedimentary and volcanic rock, incised by the major rivers into shallow valleys in plateau/plain areas and into steep-walled canyons in mountainous areas. The geography includes numerous kettle features, drumlin and esker formations, frequent small lakes and wetlands filling depressions of glacial origin, and numerous rivers draining northeast to the Liard River. The climate is continental (relatively dry and cold), with lower snow depths than areas towards the coast.

The plan area overlaps with two ecoregions, six ecosections and three biogeoclimatic zones.

1.7.1.1 Ecoregion Classification System

The ecoregion classification system is a broad method of describing ecosystems. It is designed to bring into focus the extent of critical habitats and their relationship with adjacent areas. Unlike the biogeoclimatic classification system, this system stratifies the landscape into geographical units that circumscribe all elevations. The ecoregion classification system is hierarchical. The five levels from largest to smallest area are as follow: ecodomains, ecodivisions, ecoprovinces, ecoregions and ecosections. Ecodomains and ecodivisions are very broad and place the province in a global context based on broad geographical relationship. The remaining three levels place the province in context with the rest of the continent or relate areas within the province to each other. These lower levels divide the province based on areas of similar climate, physical landscape and wildlife potential. The plan area overlaps with the Liard Basin and the Boreal Mountains and Plateaus ecoregions (see Map 2).

Liard Basin Ecoregion

The Liard Basin ecoregion is an extensive area of lowland to rolling upland that extends from northern British Columbia into the Yukon. The Liard Plains ecosection is the only ecosection within the plan area.

The Liard Plaine Ecosection is a broad, rolling inter-mountain plain comprised of sedimentary rocks with a cold, sub-arctic climate. It is an area of low relief and flat or rolling topography. There is extensive drift cover with numerous lake basins. Drumlins and fluted terrain in both drift cover and bedrock are common. Several major esker systems cross the Liard Plain. The soil landscapes consist primarily of dystic brunisols. These coarse textured soils are characterized by

rapid percolation and iron accumulation, especially on acidic parent materials. The presence of charcoal in soil pits indicates a relatively high forest fire frequency.

Boreal Mountains and Plateaus Ecoregion

The Boreal Mountains and Plateaus ecoregion is a large area with a complex of lowlands, rolling and high plateaus and rugged mountains. It has a dry sub-arctic climate. Within this ecoregion five ecosections are represented within the plan area and they are: Cassiar Ranges, Southern Boreal Plateau, Ketchika Mountains, Stikine Plateau, and Tuya Range.

Cassiar Range Ecosection- The Cassiar Ranges ecosection is a broad band of mountains extending from the southeast to the northeast corner of the ecoregion. The Cassiar Mountains are predominately a granitic core surrounded by folded metamorphic and sedimentary rocks. Summit elevations range between 1,800 and 2,700 m. Surfaces below 1,800 m were overridden by ice and consequently the lower summits are rounded and commonly bare a thin drift cover. The soil landscapes of the Cassiar Mountains are a mixture of humo-ferric podzols, turbic cryosols and lithic soils. The hummo-ferric podzols are mostly located on colluvium and morainal material. Turbic cryosols are located in the alpine soil landscape where permanently frozen horizons are found on fine textured materials, such as moraines, where subsurface drainage is impeded. The areas of dominantly lithic soils include mixtures of the bare rock and significant soil development with inclusions of ferro-humic podzols and folisoils.

Southern Boreal Plateau Ecosection- The Southern Boreal Plateau ecosection covers a small area along the south boundary of the plan area. It consists of several deeply incised plateaus, where extensive rolling alpine and willow/birch habitat occur.

Ketchika Mountains Ecosection- The Ketchika Mountains ecosection is an area of high mountains and low wide valleys in the rain shadow of the Cassiar Ranges to the west. It covers a small area in the eastern portion of the plan area.

Stikine Plateau Ecosection- The Stikine Plateau ecosection is an area of rolling plateau ranging from lowland to alpine. Sedimentary and volcanic rocks underlie the area. The climate is relatively dry and cold, with lower snow depths than surrounding areas. The Stikine Plateau ecosection covers a small area east and west of Dease Lake.

Tuya Range Ecosection- This ecosection contains the most widespread rolling alpine landscape in British Columbia: composed of the northern Stikine Ranges of the Cassiar Mountains, the Kawdy Plateau, Astutla Range and small portions of the Nisutline and Dease Plateaus. The distinguishing feature of these ranges is the occurrence of fat-topped, steep-sided volcanoes, called tuyas that formed during eruptions under Pleistocene glaciers. Little boreal forest is found within this ecosection because of the relatively high elevation of the valley-bottoms—100 to 300 meters higher than in the Cassiar Ranges.

1.7.1.2 Biogeoclimatic Classification System

The biogeoclimatic ecosystem classification system incorporates information on climate, soil and vegetation to provide a framework for resource management and scientific research. It is a hierarchical classification and includes: zones, subzones and variants. Unlike the ecoregion classification system, the biogeoclimatic ecosystem classification delineates altitudinal belt of ecological zones within geographical units. Three biogeoclimatic zones are found within the plan area and they are: Alpine Tundra, Boreal White and Black Spruce, dry-cool-1 and 2, and Spruce-Willow-Birch (see Map 2).

Alpine Tundra (AT) Zone – The Alpine Tundra zone is the most extensive zone in the northern portion of the province. Most of the northern AT zone lies above the SWB zone, above elevations of 1000 to 1600 m. The climate of the AT zone is the most severe of any biogeoclimatic zone in British Columbia.

The AT zone is normally thought of as being treeless. Trees do occur sporadically in the alpine, but usually in a Krummholz form. Rocks, ice and snow are also characteristic of much of the alpine landscape. The zonal ecosystem of the AT zone is a dwarf willow, sedge, grass, and cryptogram tundra. Another widespread ecosystem is the alpine heath ecosystem, characterized by White Mountain Heather, White Mountain Avens and Netted and Polar willows.

Boreal White and Black Spruce, dry-cool-1 (BWBS dk1) Zone- The BWBS dk1 biogeoclimatic zone, also known as the Cordilleran variant of the BWBS zone is found between 250 and 1100 m in elevation. It is found from Dease Lake north to the confluence of the Dease River and McDame Creek near the community of Good Hope Lake. This variant is also located in the One Mile River, Rapid Creek, Eagle River and Red River drainages.

This zonal site series occurs on a wide range of landforms and morainal, fluvial and glaciofluvial parent materials. Forests are predominately White spruce, but some forests have a large component of Trembling aspen, Lodgepole pine and Subalpine fir. Sites dominated by White spruce with a small deciduous component have poorly developed herb and shrub layers. The moss layer is well developed. Mixed forests generally have a greater understorey development and greater floristic diversity.

Boreal White and Black Spruce, dry-cool-2 (BWBS dk2) Zone- The BWBS dk2 is the northernmost variant of the BWBS zone. It is known as the Liard variant. It is found between 350 and 1200 m in elevation and occurs north of BWBS dk1 variant to the borders of the Yukon and Northwest Territories. The variant covers the northernmost area with the exception of the Liard Plateau, which is within the SWB zone (see below). The SWB zone can also be located within the BWBS dk2 variant at elevations higher than 1200 m.

This zonal site series occurs on gradual slopes with well drained morainal and glaciofluvial parent materials. Forests are Lodgepole pine and White spruce dominated with minor components of Trembling aspen and Black spruce. Another vegetation type dominated by Wild rye and Toadflax also occurs on mesic sites and appears to reflect warmer and slightly richer site conditions, as well as a more recent fire disturbance history.

Spruce-Willow-Birch (SWB) Zone– The Spruce-Willow-Birch zone is the subalpine zone. It ranges in elevation from 600-900 and 1400 m. The SWB zone occurs above the BWBS dk1 and dk2 variants.

Zonal sites in the forested SWB zone have a well developed shrub layer dominated by Grey-leaved willow and Scrub birch with White spruce appearing as the dominant tree species with minor amounts of Subalpine fir. Upper elevations of the SWB are dominated by tall deciduous shrubs. The SWB zone is near the limit of climatic conditions that can support forest growth.

1.7.2 Social and Economic Description

1.7.2.1 Historic Land and Resource Use

Aboriginal people have used the area for thousands of years. Three First Nations claim the area or parts of it: Kaska Dena Council, Tahltan and Teslin Tlingit Council. In pre-contact times the First Nations people secured food through gathering, trapping, hunting and fishing. Food gathering depended completely on mobility. In late summer, hunters and their families moved into the mountains to hunt goat, sheep, Woodland caribou, and marmots. In hunting caribou, herds were stampeded into corrals. Meat was dried and cached for winter use.

Women did the principle collecting of fruits and vegetables. These were mainly berry crops and included soapberry, High and low-bush cranberry, salmonberry, raspberry, strawberry, currant and blueberry. Other collected vegetables included fern roots and fiddleheads, lily bulbs, birch sap, mushrooms, muskeg apples, wild onions, rose hips and wild rhubarb.

In the late autumn families gathered at various lakes where they lived for the winter season on fresh fish or dried meat stored in autumn caches. Although game was the preferred food, fish, because of its availability, was the dietary mainstay particularly throughout the winter months. Whitefish, northern pike, trout and grayling were available locally. Clubbing, angling, spearing, shooting with bow and arrow, netting and trapping were employed to catch fish.

Because of its relative inaccessibility and formidable distance to large population centres, the use of natural resources has been limited. The first commercial resource activity that occurred between the First Nations people and European immigrants was the fur trade and even today the proceeds of trapping can contribute significantly to the incomes of residents.

In the 1870s, after the establishment of the fur trade, the next significant resource exploitation was associated with the discovery of gold in the Cassiar District, near the present-day community of Good Hope Lake. Today, there is still some relatively small-scale activity related to placer mining in this area. Over the years there has been some additional exploitation of mineral resources in specific areas, for example the development of asbestos mine at Cassiar in the 1950s (now abandoned).

In the past, small amounts of timber have been harvested, primarily for local needs around the communities of Dease Lake, Good Hope Lake and Lower Post. Another type of resource use that has occurred is that associated with the guiding of hunters and fisherman.

1.7.2.2 European Exploration and Settlement

It is important to note that much of the European exploration of this region was primarily a quest for resources. In 1831 the Hudson's Bay Company sent John McLeod and a company of men to explore the upper reaches of the Liard River in an effort to find a more productive location for a trading post. This led to the discovery of the locations of several important tributaries, including the Muddy or Kechika River and the Dease River. McLeod also established important contacts with the Kaska natives and through their discussions he found that they had engaged in trade with the Tahltans who had access to the Russian trading posts on the coast. In addition to these findings, McLeod made a special note of the quality and abundance of wildlife along this stretch of the Liard. Based on the advice provided by McLeod, the Hudson's Bay Company re-established Fort Halkett at the confluence of the Smith and Liard Rivers the following spring (Karamanski 1983).

In the summer of 1834, following a prolonged wait, John McLeod set out again from Fort Halkett and ascended the Liard River, this time to explore the Dease River. He successfully completed the journey to Dease Lake and then on to the upper Stikine River. McLeod briefly encountered a native group on his return to Fort Halkett down the Dease River. From this exploration and through the observation of several recently abandoned camps he surmised that the natives in the Dease River valley had only recently come in contact with European traders. McLeod's notes also indicate that they encountered plenty of wildlife along the Dease River (Karamanski 1983).

In 1838 the Hudson's Bay Company sent out an expedition from Fort Halkett to erect a trading post at Dease Lake and to establish trading connections with the natives of that area and the upper Stikine. By the end of the summer a post had been built at Dease Lake and contact was made with the Kaska, Tahltan and Interior Tlingit. Unfortunately, the Russians had already established strong trading connections with the Interior Tlingit who ruled the intertribal trade in the area. That winter the post at Dease Lake was continually hassled by groups of Tahltan, presumably under the direction of the Tlingit, which prevented any possibility of acquiring furs. This, coupled with a lack of locally available supplies led to the post's abandonment in 1839 (Karamanski 1983).

During the late 1880s trading posts were established at Lower Post and at the mouth of the Kechika River. The later half of the 19th century brought a new wave of explorers and settlers to the area. In 1861 gold was discovered on the Stikine River. This was closely followed by the discovery of gold at Thilbert's Creek at the foot of Dease Lake in 1872. In 1873 a store was built at the confluence of the McDame and Dease rivers to provide supplies to arriving miners. It turned out to be an excellent location given a major gold discovery on the McDame River that followed in 1874. This discovery marked the beginning of the Cassiar Gold Rush which lasted until 1887 (Honigmann 1949).

With the discovery of gold came a major influx of miners to the Cassiar area. In 1874 the British Columbia provincial government improved access to this area with improvements to the portage between Telegraph Creek across the height of land to the head of Dease Lake, opening a 100 km packhorse trail. This trail would later see much more use with the discovery of gold in the Yukon (Honigmann 1949).

The year 1897, was the start of the Klondike Gold Rush in the Yukon. Again, the discovery of gold brought miners through this territory. Only this time travel wasn't entirely restricted to the Cassiar region. Of the two main routes, one passed through Kaska territory following much the same route as miners had made to McDame Creek in 1874. The only difference was that travel continued well past McDame Creek down the Dease River, then up the Liard and Frances Rivers, over the northern divide across which could be found the headwaters of the Yukon River's tributaries (Honigmann 1949).

Much of the development along the Liard and Dease rivers occurred during the 20th Century which involved the establishment of better access to the north. In 1925 Lower Post was accessed for the first time by air. In 1937 weekly flights began from Edmonton to Whitehorse, via Lower Post, and allowed for regular mail delivery to the area. In 1939 an airport site was surveyed at Watson Lake, about 40 km from Lower Post and connected by a well worn trail (Honigmann 1949).

World War II brought new activity to the Cassiar and the Liard. In 1941, Canada and the United States began to enlarge the Watson Lake airport for military purposes. Supplies and materials

were shipped into the area via the Stikine River. The portage road from Telegraph Creek to Dease Lake was gravelled and widened. Sternwheelers and barges were built to transport the supplies across the lake and down the river to Lower Post. A road was then built connecting Lower Post to Watson Lake (Honigmann 1949).

In 1942 the construction of the Alaska Highway was initiated. Lower Post benefited from its location on the newly opened route, becoming the centre for commerce and business. In 1944 the Hudson's Bay Company abandoned its McDame Creek Post, transferring its business to its Lower Post operation. The same year the Roman Catholic mission moved to Lower Post followed by a BC Police constable and game warden in 1945.

1.7.2.3 Communities

The plan area is sparsely populated, relatively undeveloped and inaccessible. The Cassiar Highway #37 and a portion of the Alaska Highway pass through the area. It includes the communities of Lower Post, Good Hope Lake, and Dease Lake. Watson Lake is just outside the plan area in the Yukon, but is integrally tied to the biophysical and cultural features in the Dease-Liard.

Lower Post was originally established as a Hudson's Bay Trading Post in 1887. The construction of this trading post had the effect of drawing in and concentrating the local native population which were predominantly Kaska. As the trading post became more permanent, the local native population began to settle in the area first at Lower Post and later in the nearby community of Watson Lake. The Hudson Bay Company closed their office at Lower Post in the 1950s but the community continued.

Following its establishment as a trading post, Lower Post was further supported by a number of transportation improvements which helped link it with more populated areas. Most notable was the construction of a small airstrip in 1925 allowing it to become the first stop on an air route from Edmonton to Whitehorse, and the construction of a rough road linking it to Watson Lake which would eventually become part of the Alaska Highway. The construction of the Alaska Highway during World War II vastly improved its connection with the outside world

Today, Lower Post has a fluctuating seasonal population and has received some benefits from local mineral and forestry development. Traditional activities continue to be very important to both the community's cultural and economic health, although wage employment is growing. Currently the headquarters for the Kaska Dena Council is at Lower Post.

The community of Good Hope Lake, with a population of about 100 people, is located on the west side of Good Hope Lake, straddling Highway 37 (the Cassiar Highway). It is approximately 140 km south of Watson Lake and 120 km north of Dease Lake. According to elders, the community is located on the site of a permanent village that pre-dated European contact, at an important node in a network of intensively used trails. The present community developed around the highway, and until its closure in 1992, the main source of employment was the Cassiar asbestos mine, located about 30 km south of Good Hope Lake.

Dease Lake is located on Highway 37 in the southern portion of the plan area. It has become the service centre for the region. A number of government and other public offices (e.g. school district, highways, and health clinic) and a banking service have recently been established in the town. Recreation facilities (community hall, outdoor skating rink and school gym), accommodations, restaurants, service stations and campground are also located in Dease Lake.

1.7.2.4 Economic Profile

The economy of the plan area is based primarily on its natural resources and on public administration. While the area has an abundance of natural resources, economic development is hampered by limited infrastructure, the long distance to markets, long cold winters, and a small and scattered resident population. First Nation's administrative offices and government offices are often the largest employers. The other employers are: construction, retail, tourism, fishing, and guiding.

The area is rich in resources for mineral exploration and mining. The McDame and Cassiar regions have seen moderate to intensive exploration and mining for placer gold, hard-rock gold and asbestos. The recent closure of the Cassiar mine (1992), which was the largest in the area, has seriously affected the economic conditions of this area. It has had a particularly devastating effect on the community of Good Hope Lake. A few band members continue to work for smaller operations that remain in the area, and the construction of a highway maintenance camp has also brought some employment opportunities.

The area has high potential for the development of recreation/tourism industry specially backcountry recreation and tourism due to the extensive areas of wilderness, remote rivers, and striking viewsapes. The tourism and highway service industry provide additional economic opportunity along both the Alaska and Cassiar Highway corridors. However, it is a seasonal economy with a number of lodges and gas stations closing for the winter months.

The Boya Lake Provincial Park is located in the plan area. The park was established in November 1965. No commercial tenures exist within the park and the only way of income generation is through the camping fees. Two people are employed on a seasonal basis from mid May to mid September.

With its diversity and abundant wildlife species and extensive backcountry areas, the Dease-Liard area is considered to have some of the best big game hunting in North America. The guide outfitting industry is dependent on maintaining wildlife populations such as sheep, mountain goat, caribou, bear, and moose and on the wilderness experience of clients. There are four guide outfitters who have significant portions of their territories in the plan area and three other with only a minor portion in the area. The guide outfitters that have tenures in this area are restricted to operating on a seasonal basis.

Only a small percentage of the plan area is suitable for harvesting. There are currently no forest tenures in the area and, to date, all timber has been harvested under short term timber sales under the MOF Small Business Forest Enterprise Program².

Trapping provides seasonal income for a number of First Nations and other residents. Although difficult to quantify, the pursuit of traditional activities such as fishing, hunting, trapping and berry-picking provide an important and continuing contribution to the First Nations economy and culture.

² The name has changed to BC Timber Sales.

2. Land Use Context

2.1 Kaska Dena Values and Concerns

The Kaska people have an extensive history of trapping, hunting, fishing and travel in the plan area. Their traditional knowledge is based on observations from a single locale and the traditional territory, over a long period of time, and it tends to be qualitative in nature. The Kaska identified their values and expressed their concerns through the Dease-Liard Area Assessment (DLAA) process. They are presented as general and zone specific values and concerns. This information was used in combination with the existing inventories during the development of management direction for the resource values in the plan area.

2.1.1 General Concerns and Values

The Kaska identified the importance of the dynamics of forests, the role and effect of fire on the stand structure over time, and reducing forest fragmentation in future harvests to lessen the impacts on animal populations.

Cultural Heritage

The Kaska Dena First Nation has gathered information on archaeological sites, traditional use areas, and trails. Some of the cultural features include the historic McDame and Davie Trails, gold rush/trading routes and First Nations heritage sites along the Liard and Dease Rivers.

They recommend the following strategies:

- avoid development near cultural sites and trails. Exceptions to this strategy may be made after fairly assessing and weighing all implications (ecological, economic, safety, etc.). This includes assessing archaeological impacts;
- management activities should be designed to minimize impact on values. (including road development); and
- values along the trails include accessibility, integrity of the trail bed, visual quality, and water quality. In terms of access and trail bed integrity, the Kaska are asking for only non-motorized use permitted on heritage trails from spring thaw to fall freeze-up (no ATV or other motorized vehicles use). Motorized winter use (i.e. snowmobiles) is acceptable.

Protected Areas

The Kaska are interested in seeing the Goal 2 Protected Areas Strategy study areas and the Horse Ranch zone protected from commercial resource extraction.

Timber

The Kaska are interested in sustainable economic development. Any harvesting should consider the inter-relationship with the surrounding landscapes as they provide a flow of animals, fish, people and plants. As such, any plan must consider the adjacent landscapes when determining the impacts of harvest in the landscape in question.

There is an interest to provide access for long-term resource management and economic development needs while minimizing impacts on environmental, social, cultural heritage, and wildlife habitat values, and existing commercial activities. Portions of the Cottonwood Burn (1982) are easily accessible from Highway 37 and possess relatively high site productivity. An opportunity exists for future basic and incremental silviculture work.

Wildlife

Hunting, fishing and trapping are a way of life and of special year-round significance to the Kaska. To sustain these resources a plan must consider the entire range of animals and fish found in the planning area. A key wildlife value is habitat that can support healthy wildlife populations. Species of particular interest include caribou, moose, sheep, goats, small furbearers and any endangered species.

A second value is access to traditional hunting and fishing activities. Consultation needs to occur with First Nations before introducing access restrictions that might affect traditional hunting or fishing activities. Existing trapping tenures should be recognized and trapline holders notified about proposed resource development activities in a timely manner.

Visually Sensitive Areas

The view from Hwy 37, major rivers, major lakes and communities are important.

Recreation

In terms of backcountry recreation the following values are important:

- hunting and wildlife viewing;
- river travel (kayaks, canoes, powered boats);
- remote lakes experience (air travel);
- multi-day hiking;
- multi-day horse trips; and
- all the above in commercial operation context.

For front country recreation the following values or areas are important:

- areas in and around Community Use zones;
- lake paddling (recreation sites);
- mountain biking (trails), hiking, horse trips;
- fly-fishing (intact riparian; fisheries values); and
- road-based tourism along the Highway 37 corridor (visual quality).

Rivers and River Corridors

A number of large rivers, creeks and lakes are of importance to the Kaska. Generally these rivers and corridors along them are important for the following values:

- riparian habitats;
- rich diversity of wildlife species and associated habitats;
- connectivity across the landscape for animal movement and plant dispersal;
- concentrations of mature and old seral forest; and
- recreational.

Of significant importance are: Liard, Dease, Blue, Cottonwood, Canyon Creek, Eagle, Turnagin, and Rapid Rivers. In addition to the above values, the corridor along Dease River and Dease Lake contains significant cultural and heritage features. It includes the sites of the old gold rush communities of Laketon and Porter's Landing, McDame Post and an area of high cultural significance to the southeast of Boya Lake Provincial Park. It also includes some unique local habitats and plant communities.

Large river corridors along the Eagle, Four-Mile, and Rapid Rivers are very valuable for backcountry recreation opportunities and riparian habitat protection. Timber is isolated and relatively poor. There is no current access to these drainages. The Kaska would like to see either protection or harvest deferral for these drainages. The river corridor along Blue River contains unique local habitats and plant communities. Water quality is important for Dolly Varden, grayling, and bull trout. It is recognized that this corridor contains viable and accessible timber. The corridors along Cottonwood River and Canyon Creek have value for backcountry and water-based recreation as well as timber extraction.

It is recognized that the best timber extraction opportunities exist along and across the Dease and Liard Rivers (Liard Plains area in the north); however, due to the high wildlife values access should be disallowed unless it is restricted by a permanent access control points.

2.1.2 Zone Specific Values and Concerns

In order to provide spatial identification of Kaska values and concerns the following zones have been outlined through the DLAA process: Good Hope Lake and Lower Post Community Use, Blue River, Cassiar, Dease River, Horse Ranch, Upper Liard South and Upper Liard West (see Map 15).

Community Use Zones

These zones include the areas around Reserve land at Good Hope Lake and Lower Post. The following values have been identified within the zones:

- community-level planning;
- community needs and local employment opportunities;
- potential for small value-added sales along Highway 37 (and Alaska Highway);
- visual quality;
- “community watershed”-style water quality management;
- range (existing tenures identified and future opportunities recognized);
- access management for tourism and mines; and
- recreation.

Blue River

This zone is comprised of high value caribou habitat (breeding, thermal cover/escape, and lichen-producing stands) and includes core caribou winter range and spring migration corridor.

Cassiar

This zone contains significant areas of high value sheep and goat habitat.

Dease River

This zone is generally comprised of good waterfowl, fish and caribou habitat. It contains critical winter range for Horse Ranch and Little Rancheria caribou herds, especially on esker complexes near Old Faddy Lake, as well as a migration corridor.

Several lakes (Wheeler, Old Faddy, Charlie, and Chain Lakes) have been identified as important for wilderness recreation. Wheeler Lake is a known concentration area for trumpeter swan, an endangered species. The area around the Chain and Old Faddy Lakes contains numerous

traplines and traditional use areas. There are extensive stand of even-aged, potentially merchantable, pine and spruce that could provide timber extraction opportunities.

Horse Ranch

This zone is comprised of high-value habitat for caribou, moose and furbearers. It also has a high cultural/historic significance for the Kaska people. They would like to see the area protected.

Upper Liard South

This zone includes a wetland complex that is known to be a moose calving and winter range area. There are extensive stands of even-aged, potentially merchantable, pine and spruce that could provide timber extraction opportunities.

Upper Liard West

This zone is generally comprised of good moose and caribou habitats for calving, summer and winter thermal cover and browse. It is a critical winter range and winter migration corridor for Horse Ranch and Little Rancheria caribou herds. It also contains extensive stands of even-aged, potentially merchantable, pine and spruce, providing timber extraction opportunities.

2.2 Present Land Use Issues, Interests, and Uncertainties

Early in the SRM planning process the team members tasked themselves to:

- Identify other ongoing processes, existing agreements, and proposed legislation and policies relevant to the SRM planning process;
- Identify critical issues, interests, and uncertainties that affect the land, its resources, and the people living within the plan area;
- Identify issues that cannot be resolved as part of the SRM planning process due to the process design and existing provincial direction and legislation, and provide interim recommendations where appropriate; and
- Identify the issues and uncertainties that could be addressed as part of the planning process and provide recommendations.

The following ongoing processes, agreements, and proposed legislation and policies have been identified as relevant to the Dease-Liard planning process:

- ongoing treaty negotiations between the Kaska Dena Tribal Council, British Columbia (BC) and Canada;
- Interim Measures Agreement between the: Kaska Dena Council³, Dease River Band Council, Lower Post First Nation and Kwadacha Band, and the Province of British Columbia;
- approved Economic Measures Concept Proposal titled Kaska Forest Enterprise;
- Memorandum of Understanding on Forest Stewardship for the Kaska Traditional Territory between the Liard First Nation (Ros River Dena Council and Kaska Dena Council), Canada and Government of Yukon Territory;
- establishment of Working Forest landbase;
- *Forest and Range Practices Act* (Results Based Code);
- protocol between the Kaska Dena Council and the British Columbia (BC) Chapter of the Canadian Parks and Wilderness Society (CPAWS); and

³ In BC the Kaska Dena Council (KDC) represents three communities: Kwadacha (Fort Ware), Lower Post and Dease River

- Memorandum of Understanding between the BC government and the Yukon government in regards to management of the Little Rancheria caribou herd.

The following key issues, interests, and uncertainties have been identified within the plan area:

- access planning and management,
- biodiversity;
- caribou management;
- community uses;
- cultural heritage management;
- fish and other wildlife management;
- Protected Areas Strategy;
- protection of boreal forests;
- protection of Horse Ranch zone;
- rare ecosystems;
- riparian management;
- sub-surface resources;
- timber availability;
- tourism and recreation management; and
- visual quality.

2.2.1 Treaty Negotiations and Interim Measures Agreement

The Kaska Dena Council, British Columbia and Canada (the “Parties”) are presently engaged in treaty negotiations under the British Columbia treaty process. The Parties signed a Framework Agreement on January 12, 1996. At the moment the negotiations are at stage four. The Agreement in Principal has not yet been negotiated, but much of it is complete. The Kaska Dena Council asserts that the Kaska Dena enjoy aboriginal rights, titles and interests in and to the Kaska Traditional Territory in British Columbia, that those rights, titles and interests are protected by ss. 25 and 35 of the *Constitution Act*, 1982 and ss. 91(24) and 109 of the *Constitution Act*, 1867, and further asserts that until such time as it has entered into a treaty or land claim agreement, the Province has no lawful authority to alienate interests in the resources in that Traditional Territory.

As a result of the ongoing treaty negotiations, the “Province”⁴ and the Kaska Dena First Nation have negotiated a 2-year Interim Measures Agreement (IMA) which expired on December 31, 2002. On March 31, 2003, the “Province”⁵ and the Kaska Dena First Nation⁶ signed a renewal agreement that will expire on March 31, 2005. The Parties entered into the IMA for the following purposes:

- to provide framework and develop a set of procedures regarding the exchange of information on cultural activities, cultural heritage resources and planned forest management activities within the Kaska Dena’s Traditional Territory;
- To advance the Kaska Dena’s involvement in resource and land use planning and management within their Traditional Territory⁷;

⁴ Represented by the Minister of Aboriginal Affairs and the Minister of Forests

⁵ Represented by the Attorney General and Minister Responsible for Treaty Negotiations, and the Minister of Forests and Minister of Sustainable Resource Management

⁶ Represented by the Kaska Dena Council, the Dease River Band Council, the Daylu Dena First Nation and the Kwadacha Band

⁷ With the establishment of MSRM in June 2001, the responsibility for strategic planning was

- To identify and facilitate opportunities that will enhance the participation of the Kaska Dena in the forest sector through economic development, training and employment;
- To foster a co-operative and mutually supportive working relationship and ensure continued communication, and consultation between MOF, MSRM, and the Kaska Dena;
- To promote stability for forest industry operations within the Kaska Dena Traditional Territory;
- To facilitate timely decision making by the MOF on forest management planning processes;
- To assist MOF and MSRM to consult with the Kaska Dena in respect of forest management planning and decision-making. The Consultation will apply to:
 - operational plans that are responsibility of the MOF, as defined by the *Forest Practices Code of British Columbia Act*;
 - Forest strategic plans that are the responsibility of MSRM; and
 - Other forest management activities that may potentially impact the Kaska Dena communities which would include, but not necessary be limited to⁸: Timber Supply Review (TSR) and Allowable Annual Cut (AAC) Determination, the disposition of timber in the form of a major licence, Co-ordinated Access Management Plans.

The IMA established a Forest Resources Council (FRC) which serves as the consultation and planning vehicle between MOF, MSRM, and the Kaska. The IMA also funded:

- training for FRC members;
- technical, operational and management training for Kaska members;
- Kaska participation in forest management planning (Kaska Dena's participation in the Dease-Liard Area Assessment process, and Dease-Liard Sustainable Resource Management Planning Process); and
- identification/exploration of opportunities that would enhance the participation of the Kaska Dena in the forest sector.

The IMA has facilitated the development of a very positive relationship between MOF and Kaska and has resulted in concrete outcomes that form the foundation upon which Kaska can build to become part of the mainstream forest economy in BC.

The IMA directs the Province and the Kaska to:

- work together to identify opportunities for the Kaska Dena to achieve a share of the economic benefits that flow from the development of the forest sector within their Traditional Territory;
- work together to identify opportunities for the Kaska Dena to access available volumes of timber in their Traditional Territory including volumes that may come available as a result of any transfer of forest licences; and
- work together to identify forest tenure opportunities for the Kaska Dena in the Mackenzie Forest District and/or Skeena-Stikine Forest District.

2.2.2 Forestry Economic Measures Agreement

In August 2002 the government approved the Economic Measures (EM) Concept Proposal, titled Kaska Forest Enterprise, submitted by the TNO on behalf of the Kaska Dena Council. The approved economic development measure will span a 3-year period through March 31, 2005, and

transferred from MOF to MSRM. MSRM would now be involved in work planning for the Forest Resources Council. Subsequent to its establishment, MSRM in Skeena Region has continued to implement the spirit and intent of the initial IMA.

⁸ Some activities identified are the responsibility of the MSRM (Co-ordinated Access Management Plan)

is critical to building on the initial IMA and positioning Kaska for an important economic development enterprise in the forest sector.

The first component of the project includes a continuation of the Forest Resource Council established in the initial Interim Measures Agreement to ensure that the good communication, positive relationships and co-operation continue. The second and substantive component of the project involves the establishment of a viable Kaska forestry enterprise. This project will help provide a strong economic base for the Kaska communities which have little in the way of other economic prospects.

The expected outcomes of the project are:

- increased First Nations and general economic activity in local areas around the Kaska communities (Lower Post, Good Hope Lake and Kwadacha (Fort Ware))- technical, professional and management jobs, revenues for both BC (stumpage) and for the Kaska from logging, saw-mills and other processing;
- greater wealth for the Kaska communities and individuals through the establishment of forestry-related business, logging contracts, sales of timber from licenses, professional, technical and management jobs for the Kaska members;
- continued integration of the Kaska into local planning processes, including forest development plans, range use plans, landscape level plans, timber supply reviews, etc; and
- improved provincial economic interest which includes reducing land use conflicts and increasing access to natural resources.

2.2.3 Memorandum of Understanding on Forest Stewardship for the Kaska Traditional Territory

On July 29, 2002, a Memorandum of Understanding on Forest Stewardship for the Kaska Traditional Territory was signed between the Liard First Nation (as Ross River Dena Council and Kaska Dena Council), Canada and Government of Yukon Territory. The purpose of the Agreement is (not a complete list):

- to establish a mechanism for the Kaska to participate in the management of Forest Resources in their Traditional Territory;
- development of a regional Forest Resources Management Plan, which will provide broad direction in the management of forest resources in the Kaska Traditional Territory.

The Dease-Liard Sustainable Resource Management Plan is being developed in partnership with the Kaska Dena. A person representing the Kaska at the Dease-Liard planning process is the chair of the Kaska Forest Resources Stewardship Council (Yukon), which oversees the development of the regional forests management plan (Yukon). This will help to harmonize the management direction on both sides of the border. The SRMP will be referred to the Department of Indian and Northern Affairs, Renewable Resources, Yukon and comments received incorporated into the SRMP as appropriate.

2.2.4 Establishment of Working Forest Landbase

One of government's New Era commitments was to establish a working forest landbase to provide greater stability for working families, and to enhance long-term forestry management and planning. The proposed policy "A Working Forest for British Columbia" has been developed on behalf of the government by MSRM, with significant input from a number of other government ministries and agencies.

“Working Forest” is defined as all Crown forest land in the province that is outside of protected areas and parks. The key purpose of a Working Forest is to contribute to the province’s economic security by increasing the level of land-base certainty for the forest sector (Forest products account for more than half of the province’s total export and the forest industry continues to account for a substantial portion of provincial employment and Gross Domestic Product) and for other appropriate economic uses on the forest land base, in balance with the need for conservation and stewardship of our rich forest heritage.

The harvesting targets that may be developed for the forest sector within the working forest must:

- reflect a full array of resource values such as timber, wildlife, recreation, cultural, etc;
- reflect the results of LRMPs and Regional Land Use Plans where these exist; and
- must be established in a way that provides enhanced certainty for the forest industry, other social and land economic interest, and environmental integrity.

Sustainable Resource Management planning will be the vehicle for the implementation of the working forest policy once approved. Considering that an LRMP has not been and will not be completed for the Dease-Liard area, the completion of the DLSRMP is essential for the implementation of the policy as it will establish management objectives for those values that are critical for the implementation of the working forest concept (timber, biodiversity, wildlife, cultural heritage, etc.).

For more information refer to the Working Forest Discussion Paper, January 2003. The document can be found at <http://srmwww.gov.bc.ca/rmd/workingforest>.

2.2.5 Results-Based Code

In the spring of 2002, the government introduced a discussion paper on a *Forest and Range Practices Act* (a Results-Based Code) that will replace the existing *Forest Practices Code of British Columbia Act*. New legislation was introduced to the legislature in the fall of 2002, and implementation commenced in April 2003. The intent is to move to a full implementation of the Results Based Code after April 2005. The Ministry of Forests, supported by the Ministry of Sustainable Resource Management and Water, Land and Air Protection, led the development of a results-based forest practices regime.

The foundation of a result-based regime requires two fundamental cornerstones. One of them is clear definition of results; what is to be achieved and where it is to be achieved. This cornerstone comprises landscape level objectives, result statement, or rules that will affect the required outcome.

The legal framework will consist of three main pillars. The first one is landscape level location (and intensity) controls comprising:

- spatially explicit land use zones that specify where something is to be achieved;
- land use objectives that specify what is to be achieved within each zone; or
- interim zones and objectives that would be employed in circumstances where a default is needed in the absence of established objectives.

Landscape level zones and objectives will direct the location and intensity of forest development. Spatially explicit land use zones and objectives are integral to the effective working of a results-based regime. Objectives for each zone will specify what is to be achieved in terms that are

measurable, or will at least define the forest attributes that must be retained to address requirements of the value. A forest licensee who submits the Forest Stewardship Plan (FSP) for approval will have to provide evidence to demonstrate that the FSP will achieve objectives for zones located in the area encompassed by the plan.

MSRM will be responsible for leading strategic planning to balance social, economic and environmental interests in land use, and will be establishing landscape level zones and objectives. The Dease-Liard SRMP, as a landscape level plan, will be a vehicle for the implementation of the Results-Based Code within the area under the plan.

2.2.6 Protection of Boreal Forests

The Canadian Parks and Wilderness Society (CPAWS) is an Environmental Non-Government Organisation, founded in 1963, and is Canada's grassroots voice for wilderness protection. Since its founding, CPAWS has helped protect over 100 million acres of Canada's wild areas. The CPAWS has played a lead role in nearly doubling the amount of protected wilderness in Canada since 1989. The parks they have helped create include Tatshenshini, Nahanni, Grasslands, Bruse Peninsula, etc.

The BC chapter of CPAWS, one of the ten regional chapters, was formed in 1977 in order to represent the Society in Canada's most western province. The BC chapter has been involved both in campaigning for new protected areas and fighting for the preservation of the ecological integrity of existing parks.

Their newest campaign, the Northern British Columbia Conservation Initiative, is BC's part in their larger National Boreal Forest Campaign. The mission of the CPAWS Northern British Columbia conservation program is to minimize development impacts on British Columbia's northern wild lands by maintaining the existing land use patterns and keeping these large landscapes roadless, with particular focus on the northern boreal forest. This creation of large protected areas will be a component of this mission.

On July 26, 2002, the Kaska Dena Council and CPAWS (BC chapter) signed a protocol agreement. The agreement set out the relationship between the parties with respect to the planning and management of lands and resources within BC's portion of the Kaska Dena Traditional Territory that is within the CPAWS's Teslin-Dease Study Area.

The Skeena Region MSRM has established a productive relationship with the BC chapter of CPAWS, and several meetings have already taken place between the Kaska, CPAWS and MSRM to discuss the issues. The plan will be referred to CPAWS for their review and the comments received will be incorporated as appropriate. For more information on CPAWS National Boreal Forest Campaign refer to the following site <http://www.cpaws.org/boreal>.

2.2.7 Timber Availability

The Dease-Liard plan area falls within the Dease-Liard Timber Supply Block (TSB) of the Cassiar Timber Supply Area (TSA). The boundaries of the Cassiar TSA were established in 1980. An inventory database was compiled in 1983, and in 1984 the first Annual Allowable Cut (AAC) was set at 140,000 cubic metres. In 1995 the chief forester determined a new AAC of 400,000 cubic metres, effective January 01, 1996. The timber was partitioned to the following supply blocks: Iskut and Boundary (240 000 m³), Dease-Liard (120 000 m³) and Atlin (40,000 m³).

In the 1997 timber apportionment (the apportionment was a result of the chief forester's 1995 AAC determination in which he increased the AAC from 140,000 to 400,000 m³) the Minister decided to hold apportioning some of the AAC in order to provide for an orderly transition to allow communities to adapt to and plan for this increased AAC. At this time the Dease-Liard TSB remained unapportioned pending further consultation with local communities, development strategies for timber, and establishing training opportunities for local people.

Effective January 01, 2002, the new AAC for the Cassiar TSA was set at 305,000 cubic metres. Within the AAC partitions are specified to the following supply blocks: Iskut and Boundary (120,000 m³), Dease-Liard (153,000 m³) and Atlin (32,000 m³). As the Dease-Liard Area Assessment Process was not completed, no information from the process was considered in this determination. The supply block still remains unapportioned. By the time of the next AAC determination, which must take place within five years of this determination, the Dease-Liard SRMP will be completed and information from the plan will be considered.

2.2.8 Access Planning and Management

Considering the impact that access can have on other resource values, particularly on wildlife, access planning and management has been identified by the Kaska Dena and Canadian Parks and Wilderness Society (CPAWS) as a critical issue that needs to be addressed. The Dease-Liard SRM Planning Process has not been designed to produce a comprehensive access management plan. The plan will only address access for timber harvesting. This will be accomplished through objectives and strategies for the management of resource values such as wildlife, biodiversity, cultural heritage, etc. Access restrictions developed will not apply to sub-surface resources exploration and/or development.

2.2.9 Sub-surface Resources

Mineral exploration and mining are addressed in SRM Planning through use of the "two-zone model". The two-zone system ensures mining applications are considered, subject to all applicable laws, anywhere but in a park, ecological reserve, protected heritage property or an area under the *Environment and Land Use Act*. Development that may occur must reflect various appropriate development practices, such as those legally directed by the *Mineral Exploration Code* or other restrictions determined by the Ministry of Energy and Mines after referral with other government agencies and First Nations.

There is nothing in the Dease-Liard SRMP that directly prevents mining development. However, this does not prevent the Ministry of Energy and Mines, when they issue a work permit on a mineral claim, from applying whatever appropriate restrictions that they determine necessary. In addition, it does not preclude the application of other legal requirements to the mining activity. Any substantial mining development is also subject to the environmental assessment process.

For more information on "two-zone model" refer to the brochure "A Two-Zone Land Use System for Mineral Exploration and Mining in BC", January 2003, published by the Ministry of Energy and Mines and MSR. The copy can be found on the following site http://www.em.gov.bc.ca/Mining/Two-Zone/two_zone_system.htm.

2.2.10 Caribou Management

Caribou in the Dease-Liard plan area are the mountain/terrestrial ecotype. Their general ecology is to summer in alpine habitats and move to forested winter ranges where terrestrial lichens are the primary winter forage. The caribou have seasonal ranges for calving, summer, rut, and winter and migrate from winter range to the alpine ranges. Woodland caribou populations in the plan area are identified as two separate herds (herds are defined as separate populations). The Little Rancheria herd and the Horse Ranch herd have distinct seasonal alpine ranges, but overlap on winter range. The populations are stable, and the habitats are relatively unfragmented at this time.

Caribou management has been identified as the most sensitive issue within the plan area due to the overlap between the best caribou winter habitat and timber that is the most suitable for harvesting. In addition, the Little Rancheria herd is a transboundary herd with alpine ranges primarily within the Little Rancheria River watershed, but winter range includes portions of the Blue River, Dease River and, Upper Liard watersheds in BC, and the Little Rancheria and Liard watersheds in the Yukon.

In 1997 the Province of British Columbia, represented by the Premier, and the Yukon Government, represented by the Government Leader signed an agreement called “BC-Yukon Intergovernmental Relations Accord”. Wildlife management across the borders was one of the priorities that needed to be addressed. This agreement was in effect until September 30, 2000. Pursuant to this agreement, in August of 2001, a Memorandum of Understanding (MOU) was signed between the government ministry in British Columbia (signed by the Deputy Minister of WLAP) and the department of the Yukon government responsible for the management of wildlife and the environment in the respective jurisdiction. Both governments made a commitment to continue to explore opportunities to collaborate on joint management of the Rancheria Caribou Herd. The parties agree to identify and engage key agencies and stakeholders to address critical issues regarding the sustainable management of the herd”. On November 27, 2002, a group of local ecologists and wildlife/caribou specialist met for a one day workshop to discuss caribou management in the plan area. Their recommendations have been incorporated into the caribou management direction.

The management direction that will be developed for the caribou in the DLSRMP may impact the caribou management in the Yukon, and be incorporated into the planning processes that are anticipated by the Yukon government. The plan will be referred to the Fish & Wildlife Planner of the Fish and Wildlife Branch, Yukon Environment, and Liard Regional Biologist, Habitat and Regional Management, Fish and Wildlife Branch, Yukon Environment and their comments incorporated into the plan as appropriate.

For more information on caribou in the area, refer to the draft document “Identification and Analysis of Landscape and Stand Winter Habitat Management Requirements for the Little Rancheria and Horse Ranch Woodland Caribou Herds” prepared by Norm McLean. The copy can be obtained from MSRM or WLAP.

2.2.11 Tourism and Recreation Management

The Dease-Liard planning process was initially designed to provide management direction to forestry operations. In June 2002 the Kaska Dena and the CPAWS expressed an interest in developing a recreation/ tourism chapter. Some background work has been done; however, due to the lack of resources, this chapter could not be completed to the standards desired by the Kaska and MSRM. A tourism chapter may be developed at a later time.

2.2.12 Other Issues, Interests and Uncertainties

A management direction for: fish and other wildlife, riparian, rare ecosystems, biodiversity, protected areas strategy, Horse Ranch zone, visual quality, community uses, and cultural heritage is provided in the Dease-Liard Sustainable Resource Management Plan. The level of detail of the management direction provided depended on the availability of information.

2.2.13 Dease-Liard SRMP Relation to the Treaty Negotiations, IMA, Forestry EM Agreement, and Timber Availability

The above mentioned processes and agreements are interrelated and to some extent depend on each other for their implementation. Their ultimate goal is to increase economic activities and development in the Kaska Dena traditional territory. This will be mostly accomplished through the forest sector by making timber available to the Kaska Dena First Nation.

Many parts of the above agreements can be accomplished without the DLSRMP; however, its completion is important for some of them. In the 1997 timber apportionment announcement the Minister of the Ministry of Forests did not apportion the Dease-Liard Timber Supply Block, pending further consultation with local communities, development strategies for timber, and establishing training opportunities for local people. While the IMA provided the funding for the training and fulfilled the requirement for training opportunities, the DLSRMP will fulfil the other two requirements, consultation with local communities and development strategies for timber.

The completion of the plan will allow the Minister to fulfill his mandate and apportion the Dease-Liard Timber Supply Block. Consequently, MOF and the Kaska Dena Council will be able to work together to identify a forest tenure opportunity for the Kaska Dena. The award of timber tenure to the Kaska Dena is important as it will help the Kaska to position themselves for an important economic development enterprise in the forest sector.

3.0 Legal Direction

3.1 Existing Policies and Planning Direction

Sustainable Resource Management Planning is presently guided by the following policies, standards and principals:

- Landscape Unit Planning Guide, February 2000;
- Sustainable Resource Management Planning, A Landscape-Level Strategy for Resource Development, May 2002;
- First Nations Consultation Policy, June 2002;
- Sustainable Resource Management Planning Standards (draft), January 2003;
- MSRM First Nations Consultation Guidelines for SRM Planning (draft), March 2003;
- Sustainability Principals and the Governance for Sustainability (draft June 2003); and
- Sustainable Resource Management Planning: A Guide to Resource Analysis (draft), June 2003.

The Ministry of Sustainable Resource Management regional director is the approval authority for Sustainable Resource Management Plans except for those decisions that involve significant social choices. It is up to the regional director to consider if the approval of the SRMP involves

significant social choice decisions and to forward these to the Assistant Deputy Minister, Resource Management Division for approval by the Minister.

The social choices have not been made for the plan area through other levels of planning (such as LRMP), and decisions will be made during this planning process that involve some social choices. Due to these circumstances, MSRM, Skeena Region regional director has decided to forward the Dease-Liard SRMP for approval by the minister.

4.0 Biodiversity/Wildlife

4.1 Introduction

This chapter addresses the conservation of biodiversity and wildlife values. It includes a short synopsis of the ecological setting or distribution of ecosystem types across the landscape, and a summary of the key patterns in the distribution and habitat associations of biodiversity and wildlife species. The planning recommendations are derived from an understanding of the natural disturbance regimes known to influence habitat change across the plan area, and a separation of planning approaches into coarse and fine filter concerns. The coarse filter objectives and strategies are derived directly from information on natural disturbance regimes and the patterns they tend to leave on the landscape. The fine filter, or species-specific, objectives and strategies are derived from knowledge of natural disturbance patterns coupled with more detailed information about the species' ecology.

4.2 Ecological Patterns

4.2.1 Ecological Setting

The plan area lies within the Northern Boreal Mountains Ecoprovince, and includes portions of the Liard Basin and Boreal Mountains and Plateaus Ecoregions. Various rivers, notably the Dease, Rapid and Blue, drain north and east from the rolling mountains and plateaus which cover the west and south of the plan area. The tributaries to these rivers drain portions of five Boreal Mountains and Plateau ecosections: the Tuya Range (TUR) in the northwest, the Stikine Plateau (STP) in the southwest, the Southern Boreal Plateau (SBP) in the south, the Cassiar Range (CAR) in the middle, and the Kechika Mountains (KEM) in the east. The sixth ecosection overlapping the plan area, the Liard Plain (LIP), is a lower elevation plain in the northeast section of the plan area. The Rapid and Blue Rivers join the Dease in this relatively flat terrain, and become tributary to the Liard River, which flows through the north of the plan area from the Yukon.

The biodiversity of this boreal area is relatively high because of the diversity of bedrock types, and the varied terrain ranging from mountains with tundra to forested floodplains of substantial rivers. At least one-third of the plan area is in the Boreal White and Black Spruce (BWBS) biogeoclimatic zone, most of which is in the Liard Plain ecosection. This is the largest contiguous area of BWBS in British Columbia west of the Rocky Mountains, a large rolling plain of lodgepole pine (*Pinus contorta*), black spruce (*Picea mariana*), white spruce (*Picea glauca*) and trembling aspen (*Populus tremuloides*) forests with frequent lakes and wetlands, extending up to elevations of 1000-1100 m (DeLong *et al.* 1991). Most of this falls in the Liard variant (BWBSdk2), with a more continental climate. There is a ribbon of the Stikine variant (BWBSdk1) in the upper Dease valley, where the climate is less extreme (Banner *et al.* 1993). The Spruce-Willow-Birch biogeoclimatic zone also comprises about one-third of the plan area,

extending at higher elevations than the BWBS, from as low as 900 m up to 1500 m elevation. Forests are predominantly white spruce and subalpine fir (*Abies lasiocarpa*), with some lodgepole pine, black spruce and trembling aspen. The landscape also has extensive shrub carr communities, comprised of various willows (*Salix* spp.) and scrub birch (*Betula glandulosa*), both in valley bottoms and on higher slopes (Pojar and Stewart 1991a). Above the SWB, the Alpine Tundra (AT) zone covers large portions of the south and west of the plan area. This zone is dominated by a complex of dwarf willows (e.g., *Salix reticulate* and *S. polaris*), grasses (e.g., *Festuca altaica*), sedges (*Carex* spp.), and lichens (including *Cladonia* and *Cladina* species), but also includes a variety of wet meadow, krummholz and unvegetated areas (Pojar and Stewart 1991b).

4.2.2 Patterns of Diversity

The area is far from fully inventoried for its biodiversity, but certain patterns of species richness and rarity are clear. The periodically flooded habitats in the major valley bottoms (Liard, Dease, Rapid and Blue) appear to have the highest species richness. This is certainly true for breeding bird communities in the Liard valley (Eckert *et al.* 1997), and probably results from the relatively high productivity, and the diverse, well-interspersed, plant communities, of the floodplains. The extensive upland forests and shrub carrs of the BWBS and SWB are less species rich. The species richness of the AT is poorly studied, but may be relatively high as a result of post-Pleistocene colonization from Beringian and southern refugia. The fauna includes a number of species associated with arctic ecosystems (and likely northern refugia), such as arctic ground squirrel (*Spermophilus arcticus*). In summary, riparian habitats should receive particular attention in planning for forest management.

Some of the rare and more unique species occur on the relatively uncommon areas of calcareous bedrock, in the wetlands and on edaphic disclimaxes. For example, of 15 blue or red listed plants (element occurrences) in the British Columbia Conservation Data Centre database (<http://srmwww.gov.bc.ca/cdc/products>) for ecosections in the plan area, at least 3 were found on calcareous soils, 3 in wetlands, and at least 4 on open slopes among the forests. Calcium rich uplands support some rare plant species such as Two-flowered Cinquefoil (*Potentilla biflora*), Tundra Milk Vetch (*Astragalus umbellatus*) and Smooth Draba (*Draba glabella*). The calcium-rich marl lakes of the middle Dease drainage have a unique invertebrate fauna, including some rare molluscs: Cloaked Physa (*Physa megalochlamys*), Obtuse Physa (*Physa sibirica*), and Attenuate Fossaria (*Fossaria truncatula*). Wetlands and bogs support such rare plant species as European Water Hemlock (*Cicuta virosa*), Hairy Butterwort (*Pinguicula villosa*), and Whitish Rush (*Juncus albescens*). Some sites, frequently disturbed by fire, flooding or landslides, often have a fairly stable grassland, forb or shrub community (edaphic climax). These include such rare plant species as Gorman's Penstemon (*Penstemon gormanii*), Davis' Locoweed (*Oxytropis davisii*) and Yukon lupine (*Lupinus kuschei*). In summary, the relatively uncommon areas of calcareous bedrock deserve particular planning attention.

All drainages in the plan area are tributary to the Liard River, and therefore part of the Arctic drainage system via the Mackenzie River. The fish fauna includes some species with arctic affinities, such as grayling (*Thymallus arcticus*) and round whitefish (*Prosopium cylindraceum*), as well as others with wider distribution in British Columbia, such as lake char (*Salvelinus namaycush*), bull trout (*Salvelinus confluentus*), and mountain whitefish (*Prosopium williamsoni*) (<http://www.fishwizard.com>). Fish are still relatively abundant and of large size in many lakes and rivers in the area.

A substantial number of bird and mammal species in these boreal forests and mountain ranges have large ranges or are migratory. They occupy certain portions of the landscape at certain seasons, and use certain areas for migration. The migratory patterns for birds are not well documented. It is likely that many migratory passerines, waterfowl and shorebirds use the wide valley of the Dease river, with its lakes and wetlands, as a flyway through the northern boreal mountains on their way from coastal wintering areas to their summer ranges in the these mountains, or on the Liard Plain, or further north. This route might originate in the Nass, Iskut or Stikine drainages and include the Tanzilla or Tuya Rivers. These valley-bottom habitats are likely used by such threatened species as Long-tailed Duck (*Clangula hyemalis*), Short-billed Dowitcher (*Limnodromus griseus*), and Smith's Longspur (*Calcarius pictus*), as well as numerous more abundant species.

The plan area includes the ranges of two herds of caribou (*Rangifer tarandus*), the Horseranch Herd and the Little Rancheria Herd, which are of particular importance to this plan because of the potential conflicts of timber harvesting and caribou habitat management. These are both migratory herds with somewhat overlapping winter ranges in the Taiga forests of the Liard Plain, and southerly or westerly migratory routes to subalpine and alpine calving, summer and rutting ranges in the northern boreal mountains (Maclean 2002, Florkiewicz *et al.* 2001). The caribou, along with gray wolf (*Canis lupus*), grizzly bear (*Ursus arctos*), black bear (*Ursus americanus*) and moose (*Alces alces*), comprise a predator-prey system that occupies the majority of the plan area.

Moose occupy most of the plan area in one season or another, but mostly winter in the valley bottoms or on the Liard Plain. Stratified random block population surveys of moose in early 1997 produced an estimate of 2,023 moose in the Liard plains section of the plan area, which covers the great majority of the winter range (Marshall 1997). A survey of thinhorn mountain sheep in the Cassiar ranges portion of the plan area in March 1998 produced a minimum count of 335 sheep and 213 mountain goats (Marshall 1998). These are recognized to be underestimates of the full population, but the survey covered the majority of the ranges of these species in the plan area.

4.2.3 Rare Species and Communities

The distribution and abundance of rare species and rare plant communities are poorly inventoried in this part of British Columbia. Nevertheless there are some data and patterns that need to be addressed to make forest management sustainable, and there are data gaps that need to be identified. The following information comes from listings and maps of the Conservation Data Centre of the Ministry of Sustainable Resource Management (<http://srmwww.gov.bc.ca/cdc>). Red-listed species are endangered or threatened with extinction if current threats are not managed for, and blue-listed species are vulnerable because of particular sensitivity to human activities.

Records include 11 red or blue-listed plant species in the Liard Plains ecosection, and 8 species in the Cassiar Ranges ecosection. The association of a number of these plants with calcareous bedrock is detailed above. There is one blue-listed plant community, labelled *Poa rupicola* (Timberline bluegrass), reported from two biogeoclimatic zones (Spruce-Willow-Birch and Alpine Tundra) overlapping the plan area. However, the area is so poorly inventoried that these listings are likely very incomplete (Pojar, J. *pers. comm.*).

Four species or subspecies of blue-listed butterflies are likely to exist in the plan area judging by records and habitat associations presented by Guppy and Shepard (2001). A subspecies of Boeber's fritillary (*Boloria astarte distincta*) lives in alpine habitats. Three others use lower elevation sites in the BWBS or SWB, and they are: Draco Skipper (*Polites draco*) using dry pine

forests with extensive grass; Arctic White (*Pieris angelica*) using forest openings; Cranberry Blue (*Vacciniina optilete*) using *Vaccinium*-rich habitats in bogs (Guppy and Shepard 2001). Two species of blue-listed dragonflies, the Canada whiteface (*Leucorrhinia patricia*) and muskeg emerald (*Somatochlora septentrionalis*), both live primarily in *Sphagnum*-rich peatlands and bogs and are likely found in this portion of the BWBS (Cannings, R.A. 2002). Conservation of these insects can likely accommodate forest harvesting as long as water levels are not substantially altered in wetlands, and natural and anthropogenic disturbances continue to create or maintain an array of early seral habitats.

There are 2 species of red and blue-listed fish reported from the plan area - the bull trout (*Salvelinus confluentus*) and Dolly Varden (*Salvelinus malma*) (<http://www.fishwizard.com>). Bull trout have been found in all the major drainages, including the Liard, Dease, Little Rancheria and Red. The Dolly Varden has also been found in the Dease as far upstream as the Rapid, and in the Liard. A third listed species, inconnu (*Stenodus leucichthys*), does occur in the Liard drainage just east of the plan area, but has not been recorded in the plan area. Forest management activities could be detrimental to these species through increased siltation at road crossings, creation of barriers to fish migration at road crossings, and road layout close to heavily used staging or wintering habitats where angling can quickly depress population levels (McPhail and Baxter 1994).

Eight species of red or blue-listed birds likely use the plan area for parts of their life cycle, judging by data presented in Campbell *et al.* (1990a, 1990b, 2001), and Fraser *et al.* (1999). The long-tailed duck (=oldsquaw) (*Clangula hyemalis*), probably uses some lakes as stop-over points on migration, but is also likely breeds on some of the alpine lakes of the Kawdy Plateau to the west of the plan area (Hawkings and Majiski 1991), and therefore might be found on some alpine lakes in the plan area. The wandering tattler (*Heteroscelus incanus*) may breed in alpine areas in the south of the plan area. Three raptors, gyrfalcon (*Falco rusticolus*), peregrine falcon (*Falco peregrinus anatum*) and short-eared owl (*Asio flammeus*), primarily use open wetland, un-forested, or early seral habitats. None of these three raptors has been intensively surveyed in the plan area. Smith's longspur (*Calcarius pictus*) primarily uses alpine habitats or un-treed or early seral habitats at lower elevations (Campbell *et al.* 2001). The upland sandpiper (*Bartramia longicauda*) and the trumpeter swan (*Cygnus buccinator*) are of interest to forest management, because they use habitats in the forested Liard Plains. The trumpeter swan nests on a number of lakes, including Egnell Lakes (Campbell *et al.* 1990a ; McKelvey and Hawkings 1990), though no intensive survey of the full Liard Plains has been performed. To maintain breeding populations we need to ensure that wetlands used for reproduction are identified and remain inaccessible to vehicular travel and with riparian forest intact, in a core area of 200 m around the wetland, (<http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/other/wild/part2-05.htm#swan>). The upland sandpiper breeds in open, grassy habitats in other portions of its range, but no nests have been found in the Liard Plains. Campbell *et al.* (1990b) surmise that it may breed in some of the grass-rich young seral habitats following wildfire. More secure conservation of this species would require inventory, and management to ensure a future supply of habitats, which might be relatively short-lived in terms of forest succession. Conservation of all these birds, in the context of forest harvesting, seems to depend mainly on minimizing habitat degradation and disturbance at wetlands, and on maintaining a suite of open, early seral habitats through disturbances.

Five species of blue-listed mammals are known to exist in the plan area: northern long-eared myotis (*Myotis septentrionalis*), wolverine (*Gulo gulo*), fisher (*Martes pennanti*), grizzly bear (*Ursus arctos*), and the northern mountain ecotype of woodland caribou (*Rangifer tarandus*). The myotis bat is most at risk from loss of roosting sites in mature forest and caves (Cannings *et al.* 1999). The three carnivores are most at risk from human harvest (trapping, and legal or illegal

hunting), and disturbance. Their conservation, in the context of forest harvesting, can best be insured by maintaining wilderness inaccessible to vehicles (i.e. protected refugia), and in the case of the fisher, maintaining extensive mature forest in the BWBS especially with mature balsam poplar (*Populus balsamifera*) for denning (Banci 1984; Powell and Zielinski 1994; Weir and Harestad 1997; Weir, R.D. 2000). Forest harvesting is most likely to effect the caribou herds in the plan area by reducing the ground cover of terrestrial lichens on winter range, by increasing access to caribou range for predators and people, and by increasing the habitat quality for alternative prey for the caribou predators (Bergerud 1994; Seip and Cichowski 1994).

4.3 Natural Disturbance Regimes

4.3.1 Disturbance Types

A central principle in forest management is that biodiversity is most likely to be conserved when the managed disturbance regimes approximate the natural disturbance regimes in key characteristics of temporal and spatial patterning. This is the heart of the coarse filter approach to biodiversity conservation, or ecosystem management, in the context of forest management (Hunter 1993).

The Biodiversity Guidebook of the *Forest Practices Code* (Ministry of Forests 1995) classifies the BWBS as Natural Disturbance Type 3, having ecosystems with frequent stand-initiating disturbance events. Wild fire is the most prevalent and extensive natural disturbance causing the death of whole stands in the BWBSdk (DeLong 1998, Wong *et al.* 2002), and the plan area (Francis *et al.* 1999). Flooding along major rivers may cause localized stand replacement. A number of other disturbances affect tree growth and individual tree survival, but rarely cause mortality of whole stands. These include endemic insect woody tissue feeders, such as the spruce bark beetle (*Dendroctonus rufipennis*), defoliators such as the eastern spruce budworm (*Choristoneura fumiferana*) and the forest tent caterpillar (*Malacosoma disstria*), and fungi such as tomentosus root rot (*Inonotus tomentosus*) (Wong *et al.* 2002). Spruce budworms have gone through outbreaks, spaced 14 to 28 years apart, in the Liard River valley, but only in the easternmost portion of the plan area (Shore and Alfaro 1986). Since fire has by far the largest impact on stand level changes in forest age and structure, it will be discussed more fully.

The Biodiversity Guidebook of the *Forest Practices Code* (Ministry of Forests 1995) classifies the SWB zone as Natural Disturbance Type 2 (NDT2), having infrequent stand-initiating disturbance events. Wild fire is the dominant and extensive stand initiating disturbance, but occurs much less frequently than in the BWBS. The result is a wider distribution of stand ages, and fewer even-aged stands. Gap dynamics play a key role in stand structure. Disturbance dynamics have not been well documented in this zone (Wong *et al.* 2002).

4.3.2 Temporal and Spatial Patterns of Fires

The mean return interval (MRI) of fires to any one portion of the landscape is key to estimating targets for the proportion of the landscape left in various seral stages or age classes. Researchers have completed one study of fire history patterns in the plan area (Francis *et al.* 1999). This study included detailed ground mapping of a small portion of the plan area, in the Blue River drainage of the Liard Plain. It also included a review of existing fire history databases from 1940-1990 for the 1:250,000 map sheet 104P, which falls entirely within, and comprises approximately one-third of the plan area. Other fire history studies in the BWBS of northern British Columbia, and western Yukon, have produced estimates of mean return intervals. These are summarized in

Table 1, along with the mean return interval for all disturbances as presented in the Biodiversity Guidebook of the *Forest Practices Code*. These points appear clear from the summary:

- the MRI recommended in the Biodiversity Guidebook is shorter than most measures for similar ecosystems;
- there is a wide range of reported MRIs for the BWBS;
- The BWBSdk1 (upper Dease River valley in the plan area) has a reported longer MRI than the BWBSdk2 (Liard Plain) for the same time period;
- the disturbance patch sizes proposed in the Biodiversity Guidebook are consistently much smaller than those recorded from wild fires in these ecosystems.

In addition, the following points are important to consider:

- fires are substantially more frequent in the lower elevations of the plan area (i.e. BWBS compared to SWB or AT), and are more frequent and tend to be larger in the rolling, plateau country of the Liard Plain (BWBSdk2) rather than in the mountain valleys (BWBSdk1 and SWB) (Francis *et al.* 1999). DeLong (1998) reports the same trends;
- the data sets portrayed in Table 1 (Francis *et al.* 1999, and DeLong 1998) are from relatively short time periods, which seemed to be relatively quiet for fires, so may overestimate MRI somewhat;
- the plan area includes some large patches of very old boreal forest (>250 years), especially in the Blue River area (Francis *et al.* 1999). These forests are likely structured by gap replacement processes at present, as are some aspen stands in the boreal mixedwood of Alberta (Cumming *et al.* 2000) and conceivably in this plan area;
- south-facing valley slopes tend to be more frequently disturbed than north-facing slopes (Rogean 2001); and
- fires leave patches of unburnt forest. Most small forest patches (<40 ha) in Mackenzie Forest District were remnant, older, unburnt stands (DeLong 1998). In the boreal mixedwood of northern Alberta, median area of unburned “islands” increased with fire size, and the number of unburned islands per 100 ha was most numerous in fires of 200 to 2000 ha (Eberhart and Woodard 1987).

Table 1. Summary of fire-induced disturbance rates and patch sizes in the plan area and related boreal regions

GEOGRAPHIC AREA	SOURCE	MEAN DISTURBANCE RATE (% area/yr)	RANGE IN DISTURBANCE RATES (%area/yr)	MEAN RETURN INTERVAL (years)	RANGE IN RETURN INTERVAL (years)	MEAN PATCH SIZE (ha)	MODAL PATCH SIZE CLASS (ha)
Study Area							
Blue River Forest development Area (BWBSdk2)	Francis et al. 1999 (Table 1 using 1890-1970)	0.195	n/a	513	n/a	180	40 - 250
Liard Basin Ecoregion at mid and low elevations (<1200 m) - corresponds to BWBSdk2	Francis et al. 1999 (Table 9, 1940-1990)	0.236	n/a	424	n/a	3,903 (For entire 104P map sheet, which includes BWBS, SWB and AT)	1,000 – 10,000 (For entire 104P map sheet, which includes BWBS, SWB and AT)
Boreal Mtns and Plateaus Ecoregion at mid to low elevations (<1200 m) – corresponds to BWBS dk1	Francis et al. 1999 (Table 9, 1940-1990)	0.138	n/a	725	n/a	3,903 (For entire 104P map sheet, which includes BWBS, SWB and AT)	1,000 – 10,000 (For entire 104P map sheet, which includes BWBS, SWB and AT)
Northern B.C.							
BWBS dk1 in Mackenzie Forest District	DeLong 1998 (Table 3 using 1910 - 1950)	0.300	0.22 – 0.38	333	267 - 455	n/a	101 - 1,000
Mackenzie TSA, incl. SBS, BWBS, ESSF and SWB	Rogean 2001 in Wong et al. 2002 (1860 – present)	0.32 - 1.33 (BWBS)	0.31 - 1.49 (BWBS); 0.32-0.45 (SWB)	60 - 330 (BWBS)	75 - 303 (BWBS); 220 - 303 (SWB)	960 – 2880 (BWBS); 2270 – 2880 (SWB)	n/a
Other							
Boreal forest in Kluane National Park, Yukon	Hawkes 1982 in Wong et al. 2002	n/a	0.75 – 0.43	n/a	133 - 234	140 - 1600	n/a
Boreal mixedwood forest of northern Alberta	Cumming 1997 in Wong et al. 2002 & Eberhart and Woodard 1987	0.41	n/a	244	n/a	21 – 17,770 (Range)	n/a
Biodiversity Guidebook							
BWBS with deciduous prominent	Ministry of Forests 1995 (Table 10)	1.00	n/a	100	n/a	n/a	n/a
BWBS with coniferous prominent	Ministry of Forests 1995 (Table 10)	0.80	n/a	125	n/a	n/a	n/a
BWBS alluvial	Ministry of Forests 1995 (Table 14)	n/a	n/a	n/a	n/a	<20 ha (30-50%); 20–40 ha (30-50%); 40-80 ha (10-30%)	n/a
SWB	Ministry of Forests 1995 (Table 6)	0.50	n/a	200	n/a	<40 ha (30-40%); 40-80 ha (30-40%); 80-250 ha (20-40%)	

4.4 The Focus of Biodiversity Planning

This plan focuses on planning for biodiversity conservation in the light of proposed timber harvesting in the plan area. This is the principal anthropogenic disturbance for which planning strategies and objectives need to be developed to provide more long-term security and certainty for timber harvesting and biodiversity conservation.

Timber harvesting primarily affects the conservation of biodiversity by changing the spatial and temporal distribution of habitat types on the land base, and by changing the accessibility of various portions of the land base to human activities and to mobile species other than humans.

The general approach to minimizing any risks to biodiversity from changing patterns of habitat availability is termed the coarse filter (Hunter 1993). When the managed landscape is subjected to rates and patterns of disturbance similar to those it would have experienced in the unmanaged state, then we reduce the chances that any one of the ecosystems or ecosystems elements (e.g., species) will be put at risk. This principle lies behind the strategies and objectives proposed for coarse filter management in this plan.

Even with a coarse filter approach, our management and resource extraction activities or disturbances will sometimes diverge substantially from the disturbance patterns found in the unmanaged state. An example might be a relative lack of timber harvesting in many aspen stands compared to the chance that those stands would be disturbed by wildfire. Accordingly we need to judge where those divergences might put some key elements of biodiversity at risk, and then focus management strategies and objectives on those elements individually. This is termed fine filter management.

Timber harvesting changes the pattern of human and other species' use of the landscape because roads provide such efficient travel corridors for people and some other species (largely after the harvesting), and because roads can be hindrances to normal habitat use and barriers to dispersal for some organisms (Forman and Alexander 1998). In this plan area we expect that the principal impacts of timber extraction roads on biodiversity will be to (i) increase the flow of hunters and fishermen and trappers into formerly remote areas, and (ii) increase the mobility of certain predators, notably wolf (*Canis lupus*). Increased accessibility can put small and localized populations of certain species, such as mountain goat and bull trout, at much higher risk of extirpation through over-harvesting (McPhail and Baxter 1994). It can result in increased legal and illegal mortality rates of other species, such as caribou, moose and grizzly bear, to the extent that they require restricted regional harvest quotas and seasons, or even closures. The increased mobility of certain ungulate predators, especially on snowmobile trails in winter, also seems to contribute to declines in caribou populations in British Columbia.

Managing for the detrimental effects of increased access on some species is mostly a fine filter issue. In this plan we deal with it through land use zonation, and specific recommendations for access management under various fine filter species sections.

In summary this plan focuses first on managing the land through the coarse filter, attempting to emulate patterns of natural disturbance where possible. Because of the high biodiversity values of riparian ecosystems, these deserve particular attention, as do the large predator-prey systems. Under the fine filter we give most attention to those species of interest to the people who inhabit the plan area, and to rare and endangered species.

4.5 Coarse Filter Management

4.5.1 Seral Stage Distribution and Opening Sizes

The review of the natural disturbance patterns for forest ecosystems found in the plan area leads to some recommendations regarding target return intervals for disturbances, and consequently target seral and patch size distributions. The mean return intervals recommended in the Biodiversity Guidebook are noticeably shorter than those measured through scientific investigations (Table 1; see also DeLong 1998). For more certainty around the future conservation of ecosystems in the plan area we recommend the following MRIs: SWB (NDT2) 300 years; BWBSdk1 (NDT3) 175 years; BWBSdk2 (NDT3) 140 years.

The age class distributions for various seral stages of forest are taken from the Biodiversity Guidebook (Ministry of Forests 1995, Tables 6 and 10). The upper age class limits for mature forest may not be reasonable for these zones (in particular the SWB and the BWBS dk1, where they might well be higher). We still use these definitions because the forest cover inventory uses these age class breaks for forests 140 years old or older, and operational planning has to be based on the existing inventory.

The patch sizes recommended in the Biodiversity Guidebook, although within the range of opening sizes created by small fires, are skewed to the small end of the distribution of opening sizes created by all fires. We recommend relaxing the direction of the Biodiversity Guidebook and encouraging the creation of larger openings in all biogeoclimatic sub-zones, such that the mean opening size is closer to 1,000 ha (10 km²), and that some openings are in the order of 10,000 ha (100 km²). Such large openings should not be clearcut throughout. They will include a large number of residual patches of unharvested forest, and patches of partially cut forest, aimed at emulating some of the patterns left by fires. There are various reasons for creating large openings as compared to developing more widespread smaller openings. First, the predator prey systems (wolf – moose – caribou; and lynx – snowshoe hare) have evolved to deal with these landscape patterns of habitat change, and may not persist with the same dynamics if the patterns are changed to patchy small clearcuts as recommended in the Biodiversity Guidebook. Second, concentrating harvest in adjacent areas over a number of years results in the economic benefit of reduced road building costs per year. Third, there is a benefit to wildlife and fish conservation as a result of the reduced annual increment of new roads on the land base as a whole and larger areas remaining completely un-roaded.

The Dease-Liard SRMP document provides targets for seral stage and patch size distribution (sections 3.1.2.1 and 3.1.2.2 respectively), and Appendix D of the plan describes a methodology that was used for developing targets for seral stage spatial and temporal distribution.

4.5.2 Old Seral Stage Retention and Representation

Ideally, every site series would be represented in each of the seral stage classes in similar amounts as they would be found on the landbase in the absence of timber harvesting. The likelihood, however, is that timber harvesting will tend to preferentially remove mature and old timber from mesic and hygric site series. Therefore, these site series will be relatively more common in younger seral stages. This bias cannot be assessed or mitigated without site series (ecosystem) mapping of the harvest area. It might be mitigated to some extent by retaining remnant old forest patches of mesic and hygric site series within the operational openings. These would be wildlife tree patches.

4.5.3 Stand Structure

Stand structure objectives are met by a combination of retaining structure in the cutblock opening, and by retaining unharvested, remnant patches of mature and old forest as Wildlife Tree Patches (WTPs) in operational planning. Structure can be retained in openings by leaving coarse woody debris, and by retaining some of the stand, including standing dead trees, in a partial cut. Some of the guidelines for partial harvesting are outlined in the section on strategies for caribou management.

The study of remnant patch sizes in boreal northern Alberta (Eberhart and Woodard 1987) provides some guidance as to remnant patch sizes and frequency (Table 2).

Table 2. Numbers and sizes of remnant stands by fire size class in boreal mixedwood of Alberta (from Eberhart and Woodard 1987, Table 1)

Variable	Fire Size Classes (ha)				
	20 – 40	41 – 200	201 – 400	401 – 2000	2,001 – 20,000
No. Remnants (+ SD) / 100 ha	0 (0)	0.38 (0.63)	0.96 (0.50)	0.87 (0.41)	0.39 (0.20)
Median (+ SD) island area (ha)	-	2.29 (1.91)	2.50 (1.20)	2.59 (1.03)	9.39 (8.84)

4.5.4 Landscape Connectivity

Connectivity refers to the ability of mobile species to continue to be sufficiently mobile to satisfy their life requisites after a landscape has been disturbed. In landscapes where wild fires are relatively common, ongoing connectivity of contiguous areas of mature and old forest is often broken by the disturbance. In fact, in these systems there are many fire-adapted species for which connectivity refers to sufficiently large areas of early seral condition for widespread production and dispersal of propagules or individuals. Timber harvesting and fires will continue to interrupt some of the landscape connectivity, while creating some other connectivity. The most useful approach to maximizing the net connectivity across the landscape for as many organisms as possible is to follow a coarse filter approach to timber harvesting with spatial and temporal patterns within the range of natural variability.

Connectivity in mature and old forests is probably of highest importance along stream riparian areas, and between habitats at different elevations or with an intervening valley. Many mammals repeatedly move along the same routes, and an inventory of the key movement corridors would be a useful planning tool. Some particular information is available for caribou, and will be addressed in that section. There are also recommendations in the riparian management section.

4.5.5 Species Composition

Biodiversity Guidebook and silviculture guidelines presented by Banner *et al.* (1993) provide the best reference for maintaining appropriate species composition on managed sites.

5.0 Protected Areas

5.1 Existing Protected Areas

Four protected areas currently exist in the Dease-Liard planning area. Two are provincial parks, and two are ecological reserves (Table 3, Map 11). The management direction provided in the Dease-Liard SRMP will not apply to these areas.

Table 3. Existing parks and protected areas within the Dease-Liard plan area

Park / Protected Area	Size (ha)
Boya Lake Provincial Park	4,700
Hyland River Provincial Park	30
Blue/Dease Rivers Ecological Reserves	940
Chicken's Neck Mountain Ecological Reserve	680

5.2 Protected Areas Strategy Study Areas

British Columbia's existing protected areas system meets many of our conservation and recreation needs. However, it falls short of representing the full diversity of biological, natural and cultural-heritage resource and recreational opportunities. Some areas, interests or values are not represented as well as others and some are not represented at all. Even within some well-represented areas, existing protected areas tend to over-represent alpine ecosystems and under-represent mid and low elevation forested ecosystems.

The Province's Protected Areas Strategy reflects the move to a systematic approach to planning for new protected areas. The strategy aims to protect 12 percent of each of the province's ecosections, equating to 12 percent of the province. The strategy also acknowledges that some regions may have more than 12 percent and some less, depending upon over-riding provincial objectives or existing land use commitments. As of 2000, the Province had reached its goal of protecting 12% of the provincial landbase. However, the goal of protecting 12% of each ecosection has not been met, particularly in areas without land and resource management plans.

As part of a regionally based project, the northwest region of the province was assessed to determine how well current protected areas represent the variety of ecosystems, special features, cultural features and recreational uses in the area. This project, called a "Gap Analysis", identified a number of candidate sites, called study areas, that have features or characteristics which may warrant protection. This Protected Areas Strategy (PAS) gap analysis identified areas based upon two goals:

- Goal 1 (Representativeness): To protect viable, representative examples of the natural diversity of the province, representative of the major terrestrial, marine and freshwater ecosystems, the characteristic habitats, hydrology and land forms, and the characteristic backcountry recreational and cultural heritage values of each ecosection; and
- Goal 2 (Special Features): To protect the special natural, cultural heritage and recreational features of the province, including rare and endangered species and critical habitats, outstanding or unique botanical, zoological, geological and paleontological features, outstanding cultural heritage features, and outstanding recreational features such as trails.

A brief description of the Protected Area Strategy and details of the Regional Study Area project can be found in two documents:

- 1) *Technical Gap Analysis Results Prince Rupert IAMC Region* prepared by the Prince Rupert Regional Protected Areas Team (RPAT), 1995; and
- 2) *Protected Areas Strategy for British Columbia: The Prince Rupert Region PAS Report*, RPAT, (1996).

The PAS report (RPAT, 1996) identifies six Goal 2 study areas (Table 4, Map 11). No Goal 1 study areas have been identified.

Table 4. Goal 2 study areas within the Dease-Liard plan area

Study Area	Size	Values and attributes
Dease/French Rivers Proposed Ecological Reserve	3,500	Boreal forest (BWBS) ecosystems developed on calcareous parent materials; includes mature and seral forests, mature floodplain forest, steppe grassland, complex of sand dunes and wetlands, tamarack swamps, outstanding lichen flora.
Blue River Warm Springs	3,950	Warm mineral springs, tufa deposits, wetlands downstream, some small eskers.
Liard Eskers	10, 500	One of the most distinctive compound esker/kettle fields in province; eskers range from 100 metres to several kilometres in length.
Horse Ranch Lake	2,350	Outstanding esker formation, lakes, rich wetlands (orchids) and boreal forest.
Porter Landing Historical Site		Located at the outlet of Dease Lake where Thibert Creek comes in from the west and forms a delta which is a natural dam that holds Dease Lake in place. It is also known as Thibert's Landing where a Hudson's Bay Company set up a supply depot for the diggings on Thibert Creek. In August 1878, gold was found 30 km northwest of Porter Landing, and with the new stampede, Porter Landing boomed. By the early 1900's Porter Landing was all but abandoned.
Laketon Historical Ste		Laketon is built on the delta that Dease Creek has flung out into the lake, making almost a narrows at this point. During the great gold rush in the middle 1870's, and for some years later, Laketon was the "capital" of the Cassiar District. Several structures, including the log jail house and the blacksmith shop and several other cabins, in various degrees of decay, a cemetery, and the remnants of the neatly walled Chinese gardens are what remain of Laketon, as well as a colourful history.

In 1997, the BC Cabinet approved these study areas and developed Interim Management Guidelines. The Dease-Liard SRM Planning process has not been designed to make any recommendations on protected areas.

5.3 Horse Ranch Zone

During the Dease-Liard Area Assessment process the Kaska identified the Horse Ranch zone (Map 10) as an area they would like to see protected. The area is comprised of high-value habitat for caribou, moose, and furbearers. It also has a high cultural/historic significance for the Kaska. Protection of the Horse Ranch zone is an important objective of the CPAWS as well.

The Goal 2 study areas and Horse Ranch zone may be established as protected areas through some other process such as treaty negotiations.

6.0 Timber

6.1 Previous Timber Evaluations

As a result of the Timber Supply Review of 1995, the Annual Allowable Cut (AAC) for the Cassiar Timber Supply Area (Cassiar TSA) was increased from 140,000 m³ to 400,000 m³. Due to public controversy over potential impacts of an increased level of cut, the Minister of Forests directed that implementation be limited to 200,000 m³ until the completion of land use planning in the TSA is further advanced.

As Land and Resource Management Plans (LRMPs) were not expected to be completed for several years (the decision was made later not to enter into a LRMP process for the Dease-Liard area at all), the district manager further requested a technical review of Potential Operating Areas (POAs) to provide short term advice (1-5 years) as to where harvesting could proceed with least risk to biological resource values. POAs were areas where timber harvesting was considered economically feasible based on operable timber volumes and access. The report "Evaluation of Potential Short-term Operating Areas in the Cassiar Timber Supply Area" was released by the BC Ministry of Forests, Prince Rupert Region in August 1997.

In addition, the Kaska Dena Council initiated an evaluation of the logging opportunity in the Dease-Liard Timber Supply Block as part of the Treaty Negotiations and Interim Measures Agreement. The emphasis of the evaluation was to examine the economic feasibility of timber harvesting and to identify the most economically feasible areas. The final report "Identification of Logging Chance Opportunity in the Dease-Liard Timber Supply Block", released in June 2002, is available.

6.2 Timber Zones

Due to extensive subalpine and alpine areas, with low timber volumes, a small percent of the total area is suitable for timber harvesting. Harvestable stands are scattered throughout the plan area with major concentration of timber available for harvesting in the north and north-east portions of the plan area. The dominant tree species are lodgepole pine and white and black spruce.

The plan area is divided into three zones (Map 12):

- **Timber Area A:** emphasis is on timber harvesting while conserving other resource values such as wildlife (noticeably caribou), biodiversity, visual quality, etc.;
- **Timber Area B:** emphasis is on maintaining tourism/recreation values. Considering the low value for timber the area is identified as no harvest zone; and

- **Timber Area C:** emphasis is on wildlife (Core Caribou Winter Range zone) and cultural/historical values (Horse Ranch zone). Timber value is low. The area is identified as no harvest zone.

The zone boundaries were derived based on the findings from previous timber evaluations, mapping of the timber harvesting land base completed for the Timber Supply II, and information collected through the DLAA and DLSRMP processes and Kaska Dena values and concerns identified during those processes.

7.0 Visual Quality

Visual quality is the extent to which the aesthetic or scenic value of a landscape is altered compared to the pre-existing or natural condition. The visual quality of many landscape features (e.g., scenic areas, lakeshores, significant recreational areas and natural features, travel corridors, and community viewsapes) is significant to local residents as well as to tourism and recreation activities in the area. Maintaining the aesthetic values of the forest landscape provides a secure environment for tourism operators and ensures a quality natural environment experience for both local and non-local recreationists.

7.1 Assessment of visual quality resources

Existing inventory

Visual Landscape Inventory was completed in 1996 for Dease Lake, parts of Dease River and the Highway 37.

Considerations

- visual quality needs to be managed in conjunction with the requirements for maintaining tourism/recreation values and opportunities;
- the following areas have been identified as critical for the management of visual resources: Highway 37 and Alaska Highway corridors, Lower Post, Good Hope Lake, and DeaseLake communities, large river corridors, McDame and Davie trails, Horse Ranch zone, large lake bodies, and Boya Lake Provincial Park.

7.2 Preliminary decisions

Highway 37

Visual Landscape Inventory (VLI) has been completed for Highway 37. Establish this area as scenic area and set strategic level land use objectives. Do not enter into establishment of VQOs. MOF may set VQOs as appropriate.

Alaska Highway

VLI has not been completed for the corridor. The polygons have been identified, but no recommendations for the VQOs exist. Identify the area as significant visual area (use the polygons identified in the VLI) and provide strategic land use objectives. Recommend completion of the VLI and legal establishment of scenic areas and VQOs in the future as appropriate.

Communities

Dease Lake

Extend the Highway 37 scenic area to incorporate the community. As a result of timber zoning, only a small scale, non-commercial harvesting is acceptable within the area. No impacts are anticipated to the visual quality.

Good Hope Lake

The same information exists, and the same management direction is recommended as for the Highway 37.

Lower Post

VLI has not been completed for the area. Identify the area as significant visual area (use the zone line work) and provide strategic land use objectives. Recommend completion of the VLI and legal establishment of scenic areas and VQOs in the future as appropriate.

Large River Corridors

Dease River

Inventory has been completed for Dease River. Establish this area as scenic area and set strategic level land use objectives. Do not enter into establishment of VQOs. MOF may set VQOs as appropriate.

Liard and Highland Rivers

VLI has not been completed for the corridors. The polygons have been identified, but no recommendations for the VQOs exist. Identify the area as significant visual area (use the polygons identified in the VLI) and provide strategic land use objectives. Recommend completion of the VLI and legal establishment of scenic areas and VQOs in the future as appropriate.

Other major rivers

Other rivers are located either fully or for their major parts outside of Timber Area A (where commercial timber harvesting may take place). No impacts are anticipated to the visual quality.

McDame and Davie Trails

A 100 m no harvest zone will be maintained on each side of the trails. This was considered sufficient to manage for the visual quality.

Horse Ranch zone

The area is fully located within the Timber Area C (no harvesting allowed). No impacts are anticipated to the visual quality of this area.

Large Lake Bodies

Dease Lake

Inventory has been completed for Dease Lake. Establish this area as scenic area and set strategic level land use objectives. Do not enter into establishment of VQOs. MOF may set VQOs as appropriate.

Other Lakes

Other large and important lakes are fully located within the Timber Area B (no harvesting). No impacts are anticipated to the visual quality.

Boya Lake Provincial Park

No impacts are anticipated to the visual quality.

Appendices

Appendix A: Current Seral Stage Distribution

BEC Variant	Total Forested Area	Early Existing %/ha Total	Early Existing %/ha in NC	Early Existing %/ha in THLB	Mid Existing %/ha Total	Mid Existing %/ha in NC	Mid Existing %/ha in THLB
BWBS dk1	76,016.00	13.5/ 10,283.00	11.5/ 8,813.00	2/ 1,470.00	20/ 15,093.00	16/ 12,426.00	4/ 2,667.00
BWBS dk2	464,063.00	11/ 50,173.00	10/ 43,594.00	1/ 6,579.00	30/ 138,344.00	23/ 105,952.00	7/ 32,392.00
SWB un	446,444.00	11/ 50,292.00	<11>10/ 48,743.00	<1/ 1,548.00	29/ 129,875.00	26/ 115,802.00	3/ 14,073.00

BEC Variant	Total Forested Area	Mature Existing %/ha Total	Mature Existing %/ha in NC	Mature Existing %/ha in THLB	Old Existing %/ha Total	Old Existing %/ha in NC	Old Existing %/ha in THLB
BWBS dk1	76,016.00	35/ 26,564.00	29/ 22,097.00	6/ 4,467.00	32/ 24,077.00	23/ 17,240.00	9/ 6,837.00
BWBS dk2	464,063.00	33/ 152,035.00	28/ 130,753.00	5/ 21,282.00	27/ 123,511.00	21/ 95,767.00	6/ 27,744.00
SWB un	446,444.00	60/ 266,114.00	56/ 249,861.00	4/ 16,253.32	0/ 164.00	N/A	N/A