Telkwa
Landscape Unit Plan

BULKLEY/CASSIAR FOREST DISTRICT

September 1999

Pre-amble

On April 21, 1998 the Bulkley Land and Resource Management Plan (LRMP) was approved by cabinet. At the time, MOF and MELP agreed that the best tool to implement the operational practices in the LRMP was through Landscape Unit Plans. As a result, the District Manager established and the DEO approved seven Biodiversity Objectives as landscape unit objectives on May 30, 1999. At the same time, their associated strategies were deemed District Manager (DM) Policy.

Based on LRMP direction, objectives for wildlife, fish, LRMP special management zones, timber, recreation, visual quality and range were developed, reviewed by the public, licensees, and branch staff with comments incorporated and were close to being ready for DM sign off by the beginning of June, 1999. On June 3, 1999 a memo regarding **Strategic Land Use Planning and Landscape Unit Planning** was released, signed by the Chief Forester and the Assistant Deputy Ministers of MELP, MEM, and LUCO. This memo states that Higher Level Plan Resource Management Zone (RMZ) objectives signed by cabinet would have to be established before objectives, other than the approved biodiversity objectives, could be established by the District Manager.

Higher level plan RMZ objectives are currently being developed. In the interim, in order to provide guidance in the development of operational plans, objectives for wildlife, fish, LRMP special management zones, timber, recreation, visual quality and range, and their associated strategies are now DM policy.

November 4, 1998

Re: Rationale for establishing Biodiversity Objectives in Landscape Unit Plans in the Bulkley TSA as Higher Level Plans under the Forest Practices Code of BC Act

The following provides rationale for my establishing objectives 1–7[1] in the following Landscape Units, as Higher Level Plan.

Babine	Chapman	Copper	Corya
Deep Creek	Blunt	Harold Price	Nilkitkwa
Reiseter	Telkwa	Torkelson	Trout Creek

The Bulkley LRMP, approved in March, 1998, by Government, is Ministerial Policy and was seriously considered. The LRMP represents an agreement negotiated by public and agency representatives using current information, scientific knowledge and agency policies. This agreement has been accepted by Government and will be delivered through Landscape Unit Plans which give clear direction to operational plans.

In establishing Landscape Unit Plan biodiversity objectives as Higher Level Plans, it is recognized that the information supporting them will change over time. It is fully expected that the objectives will need some form of revision based on those changes, in order that they continue to reflect current information, knowledge and policy. The Landscape Unit Plan is therefore recognized as a living document that will be subject to periodic revision as and when determined by the District Manager and the Designated Environmental Officer.

At this time, it is known that these objectives will be reviewed:

- In 1999, concurrent with the establishment of objectives for values other than biodiversity
- As more information and knowledge is gained about First Nations values and specific sites of interest through consultation with each First Nation group,

at which time these Higher Level Plan objectives may need to be amended, or new objectives added.

In establishing objectives 1–7 (and especially objective #4), I have read and am mindful of the Deputy Minister's directive on achieving acceptable biodiversity impacts. It is believed that biodiversity objectives being established will not materially affect the timber supply impacts that were agreed to through the LRMP and accepted by Government during the LRMP approval process. The Bulkley TSA is, however, currently undergoing Timber Supply Review II, the results of which will provide further information on current timber supply impacts associated with biodiversity objectives 1- 7. Upon completion of TSR II, these objectives will be reviewed.

Original Signed

Guenter Stahl, District Manager

Bulkley/Cassiar Forest District

Original Signed

Reid White

Designated Environment Official

I approve of this rationale

[1] Note: These objectives have been renumbered such that they read 1.1 to 1.7

Order to Establish the Telkwa Landscape Unit and Objectives

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, I hereby order that the Crown land portion of the watershed of the Telkwa River, including all waters flowing into the Telkwa River and its main tributaries Milk, Tsai, Sinclair, Winfield, Jonas, Cummings, Elliot, Howson, Tenas, Four and Cabinet creeks to the boundary of the Bulkley Timber Supply Area, will be established as a landscape unit effective May 30, 1999. The objectives, which are numbered 1 to 7[2] and attached to this Order, will be established as landscape unit objectives effective May 30,1999.

The boundaries of the Telkwa Landscape Unit are shown on the 1:750,0000 scale map, attached as Map 1.

note: Landscape Unit maps are available at a 1:50,000 scale at the Bulkley/Cassiar Forest District Office.

Original Signed November 4, 1998

_____ _____

Guenter Stahl, District Manager, Bulkley/Cassiar Forest District

Date

File Number 12500-25/telkwa

Note: These objectives have been renumbered such that they read 1.1 to 1.7

Statement of District Manager's Policy

Under section 41(1) of the *Forest Practices Code of British Columbia Act* (the "Act) I am required to approve an operational plan or amendment that has been prepared and submitted in accordance with the Act, the regulations and the standards, and that I am satisfied will adequately manage and conserve the forest resources to the area to which it applies.

I have reviewed the strategies for objectives 1 through 7[3] of the Telkwa Landscape Unit Plan and believe they are relevant to, and will provide appropriate guidance in, the development of operational plans and amendments which pertain to the area covered by the Telkwa Landscape Unit Plan. I therefore recommend that these strategies be considered and incorporated into operational plans and amendments where possible.

I will continue to evaluate each operational plan or amendment on its own merit prior to making a decision on whether or not it should be approved. To assist me in this process where an operational plan or amendment does not incorporate the strategies I will expect an adequate explanation of the circumstances which justify their omission.

Approval:

Original Signed November 4, 1998

_____ _____

Guenter Stahl, District Manager Date
Bulkley/Cassiar Forest District

File Number 12500-25/telkwa

Note: These objectives have been renumbered such that they read 1.1 to 1.7

November 8, 1998 File: 47250-35/Bulkley

Guenter Stahl
District Manager, Bulkley/Cassiar Forest District
Bag 6000
Smithers BC V0J 2N0

Dear Guenter:

Re: Approval of Biodiversity Objectives for the Bulkley Landscape Unit Plans

I was pleased to receive from the district's landscape unit planning team the biodiversity objectives for the landscape units in the Bulkley TSA for my approval under section 5.18.3 of *Higher Level Plans: Policy and Procedures.*

It is my understanding that the Bulkley TSA has a cabinet approved Land and Resource Management Plan and that these biodiversity objectives are consistent with this plan.

As the designated environment official (DEO), and in accordance with Section 5.18.3 of *Higher Level Plans: Policy and Procedures,* and under section 4(2) of the *Forest Practices Code of British Columbia Act*, I declare my approval for the District Manger of the Bulkley/Cassiar Forest District to formally establish the biodiversity objectives numbered 1 to 7[4] for the following landscape units:

Nilkitkwa	Babine	Torkelson	Harold Price
Blunt	Chapman	Reiseter	Deep Creek
Corya	Trout Creek	Copper	Telkwa

Yours truly,

Origional signed November 8, 1998

Reid White, R.P.Bio., P.Eng.
Regional Manager, Fish, Wildlife, and Habitat
Ministry of Environment, Lands and Parks - Skeena Region

[4] Note: These objectives have been renumbered such that they read 1.1 to 1.7

Statement of District Manager's Policy

Under section 41(1) of the *Forest Practices Code of British Columbia Act* (the "Act"), I am required to approve an operational plan or amendment that has been prepared and submitted in accordance with the Act, the regulations and the standards, and that I am satisfied will adequately manage and conserve the forest resources in the area to which it applies.

I have reviewed the following objectives and connected strategies of the Telkwa Landscape Unit Plan and believe they are relevant to, and provide appropriate guidance in, developing operational plans and amendments which adequately manage and conserve the forest resources of the area covered by the Telkwa Landscape Unit Plan:

Wildlife objectives	2.1 to 2.10
Fish objective	3.1
LRMP Special Management Zones objectives	4.1 to 4.2
Timber objectives	5.1 to 5.3
Recreation objectives	6.1 to 6.2
Visual Quality objectives	7.1 to 7.3

Accordingly, where an operational plan or amendment does not incorporate these applicable strategies, I will expect an adequate explanation of the circumstances which justify the omission of, or deviation from, any applicable strategy.

Approval:

Original Signed September 23, 1999

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Guenter Stahl, District Manager Date
Bulkley/Cassiar Forest District

File Number 12500-25/Tel

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Introduction

The Telkwa Landscape Unit Plan (LUP) outlines the objectives and the strategies for the resource management of the Telkwa River watershed within the Bulkley portion of the Bulkley/Cassiar Forest District (Map 1)[5]. These objectives and strategies have been developed by the Ministry of Forests (MOF), BC Environment (BCE), and operational foresters involved with managing the forest resources in this landscape. This plan follows Ministerial Policy as stated in the signed Bulkley Land and Resource Management Plan (LRMP) signed by the Chief Forester and the Prince Rupert Regional Landscape Unit (RLUP) planning strategy signed by the District Manager, Regional Manger, and Regional Director. Additionally, the Biodiversity Guidebook was used to guide the development of this LUP.

The Telkwa Landscape Unit and its objectives are established by the District Manager of the Bulkley/Cassiar Forest District pursuant to Section 4.0 of the *Forest Practices Code of British Columbia Act* (the "Act"). Prior to establishment under Act, the landscape unit and objectives will be approved by the Designated Environment Official for the Ministry of Environment, Lands and Parks. The objectives form the Higher Level Plan and provide direction for operational plans. The objectives for the Telkwa Landscape Unit provide sufficient detail to provide direction to the operational plans, yet remain flexible to allow creative solutions for meeting land management objectives. The objectives may be amended with appropriate rational. The strategies presented in this plan provide detail on how these objectives can be met.

The March, 1996 timber supply analysis of the Bulkley LRMP was a major consideration used in bringing a consensus to the LRMP. The analysis showed that the cumulative timber supply impact resulting from the LRMP management direction was up to approximately 10% for the Bulkley Timber Supply Area (TSA). The impacts summarized in this analysis were considered closely when establishing the following landscape unit objectives. Where objectives were established to meet a special management intent and where this caused greater impact to the timber supply in one area, objectives were modified elsewhere in the plan to lighten timber supply impacts, always with the goal of maintaining the 10% ("LRMP budget") accepted timber supply impact. In the future, when new objectives and/or additional resource constraints are incorporated into the LUP, the LRMP budget will be considered and the goal will be to attempt to keep cumulative impacts to less than 10% for the Bulkley TSA.

The Telkwa Landscape Unit was assigned an intermediate biodiversity emphasis based on analysis of timber, biodiversity, recreation, mining values and LRMP zonation.

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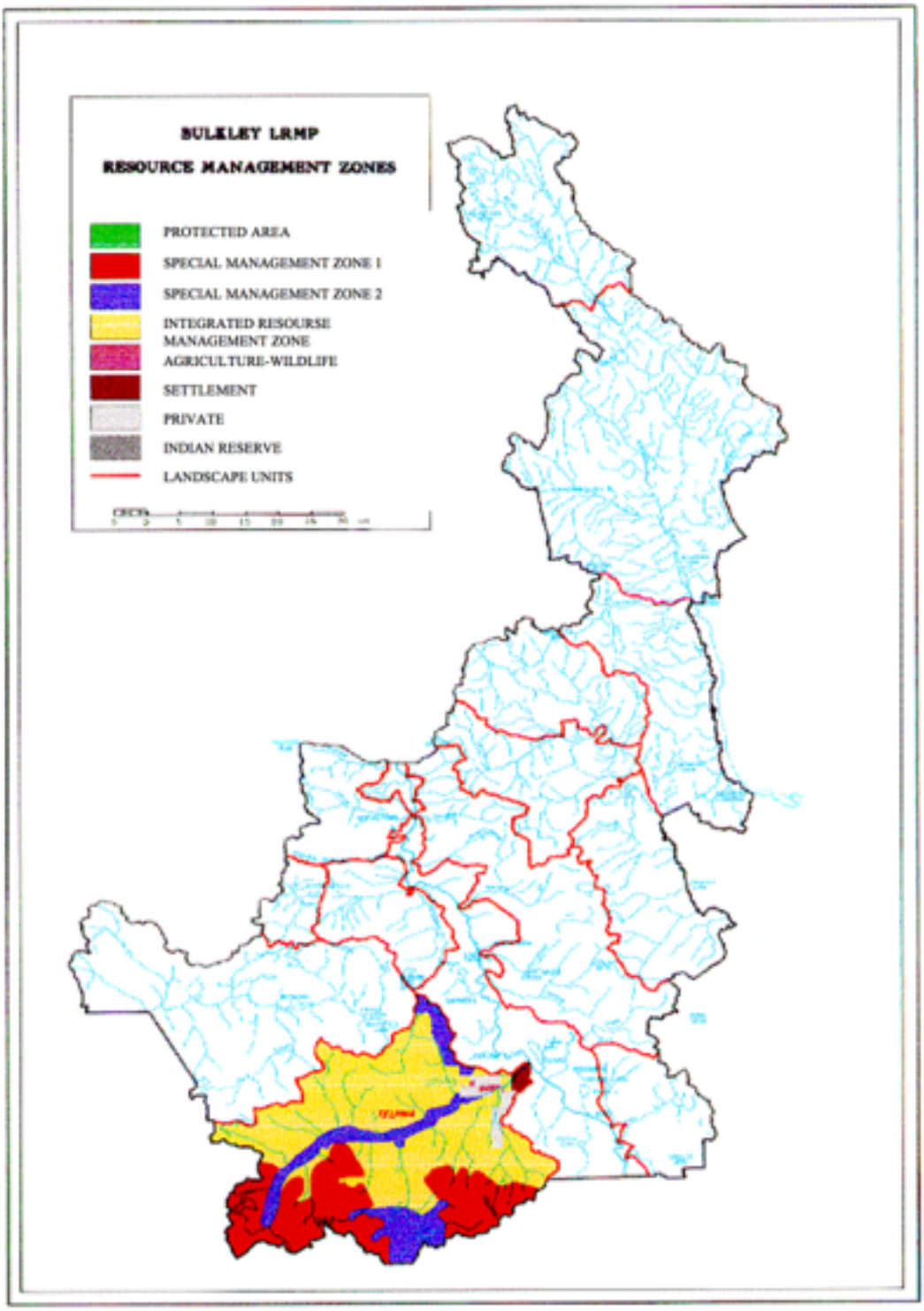
5 All maps shown in this document will be available at 1:50,000 scale on paper and in digital form from the Bulkley/Cassiar Forest District Office.

Map 1. Landscape Units in Bulkley Timber Supply Area



The Planning Area

The Telkwa Landscape Unit covers 121,584 hectares in an area south of Smithers in the transition between coastal and interior climates accounting for 14% of the Bulkley Timber Supply Area (TSA)'s operable landbase. Thirty-four percent of the planning unit is operable, mainly consisting of stands of good quality sawlog, with intermittent stands of marginal quality sawlog and some pulp. Over 20% of the operable forest within this landscape unit has been logged to date.

This landscape unit is within the traditional territory of the Wet'suwet'en chiefs Woos, and Hagwilnegh.

Wildlife values are high in relative importance. The Telkwa Range supports an isolated caribou herd that has been identified at being at risk of extirpation. From a minimum of 271 caribou in 1965, the Telkwa Mountain caribou herd declined to about 13 in March 1996, despite a complete closure on hunting after 1973. Possible causes of the decline include over-hunting in the 1960s, chronic poor recruitment of calves possibly due to predation, and range abandonment due to human-caused disturbances.

As a result of the decline, the Telkwa Caribou Herd Recovery Plan was created. This plan introduced management actions designed to reverse recent declines in population size by augmenting the herd with caribou from other populations and protect caribou habitat by utilizing existing land zonation and by modifying industrial activities to compliment caribou recovery. It also recommend a recreational access management plan.

In contrast, mountain goats are abundant. Since goats are not hunted in this area, they are used to gather baseline habitat and population data. But as timber harvesting shifts into the Engelmann Spruce-Subalpine Fir biogeoclimatic zone, access to goat habitat will increase, possibly placing greater stress on goat populations. The populations are reported to be stable, although localized declines have occurred as a result of increased access (BC Environment, January 1995).

Other wildlife found in the Telkwa include grizzly bear sightings near the Telkwa River and in the Telkwa Ranges. Class I and II moose winter range exist along the valley bottoms adjacent to the Telkwa River. Small fur-bearers are actively trapped and waterfowl use the wetlands in the Mooseskin Johnny Lake area.

Fisheries value's relative importance is high for spawning, rearing, water quality and recreational fishing. Of particular interest is the fact that salmon rear and spawn in the lower tributaries to the Telkwa River.

Recreational use is moderate to high for kayaking and canoeing, hiking, angling, camping, trail-riding, hunting, snowmobiling, and wildlife viewing. A commercial hunting guide operates from Mooseskin Johnny Lake. As well, there are a variety of well used trails into the Telkwa Mountains and two recreation sites on the Telkwa River.

Main recreational features in the Telkwa Mountains are the Telkwa River and several major creeks, including Goathorn, Howson, Jonas, Winfield, Sinclair, and Milk. As well

there are several mountain ranges including the Telkwa and Howson Ranges and the Mount Leach/Microwave area to the north. There is also an old mine site at Hunter Basin.

This unit is classified as 17% Semi-primitive Non-motorized(SPNM) and 42% Semi-primitive Motorized(SPM) according to the Recreation Opportunity Spectrum done in 1998. SPNM is defined as being further than 1 km from a road with very little or no motorized use. There is little evidence of people, minimal site modification, and a very high degree of naturalness. Similarly SPM is defined as further than 1 km from a road, however it may have occasional use by snowmobiles, ATV's, jetboats and mineral exploration that is air accessed. Scenic areas include the ski hill and areas along Highway 16, making the landscape within this unit visually sensitive.

The Telkwa Landscape Unit is underlain by bedrock which is provincially assessed as having a high to extreme probability of hosting economic metal deposits. Mineral exploration dates back to the late 1890's in the Telkwa Range. Specifically Coal bearing sedimentary rocks in the Telkwa and Bulkley River valleys have been explored since the early 1900's. Goathorn Creek and Telkwa River areas have, on a small scale supplied local markets with coal since 1918.

Exploration in the 1980's and 1990's has expanded the known resource, and application to mine the coal deposits for an international market was initiated in the late 1980's. Currently a proposed coal mine, proximal to the Village of Telkwa, is seeking development approval under the Environmental Assessment Act. A decision regarding the environmental feasibility of this proposal is expected in 1999.

Metallic mineral activity is concentrated on the south side of the Telkwa River, in alpine and sub-alpine areas where bedrock is exposed. Historic centers of activity in the Telkwa Range have been Hunter , Hankin, Dominion, Scallon, Howson and Starr Basins. Several small mines produced silver, copper and gold from the Telkwa Range in 1915 and the early 1940's. An extensive network of trails to mineral properties was established by 1911. Many of these trails are now frequently used by hikers and skiers. Currently, small mineral tenures are scattered over the eastern portion of the Telkwa Range.

Conversely, on the north side of the Telkwa River, mineral activity is more sparse. Historic activity has focused on Telkwa Pass, Milk/Tsai Creek areas, and Microwave Hill. Small scale production of gold, silver and copper from Microwave Hill is reported from 1917 to 1919. Shafts and open cuts were developed in other areas, but no production is recorded. Mineral tenures are maintained at all locations except Microwave Hill.

Objectives and Strategies

Biodiversity

The Bulkley LRMP is founded on the principles of biodiversity and sustainability. Key to delivering the biodiversity component is the ecosystem network (Objectives #1.1 and #1.2). The ecosystem network provides for old growth retention, protection of the diversity of ecosystems (including rare ecosystems) present in the Trout Creek, forest interior conditions, and habitat connectivity. The ecosytem network is intended to be flexible and will be modified as new information and inventories become available. It will also accommodate new initiatives such as wildlife habitat areas and sensitive areas. Further direction for biodiversity is accommodated through retaining old growth (Objective #1.3), varying cutblock sizes (Objective #1.5), managing for a diverse timber landbase (Objective #1.6), and retaining attributes of older forest (Objective #1.7).

Core Ecosystems

Objective # 1.1

Maintain a representative cross-section of ecosystems, retain representative examples of old seral age classes (age classes 8 and 9), provide some areas with forest interior conditions, and retain representative examples of rare and endangered plant communities within the core areas indicated on Map 2.

Strategies

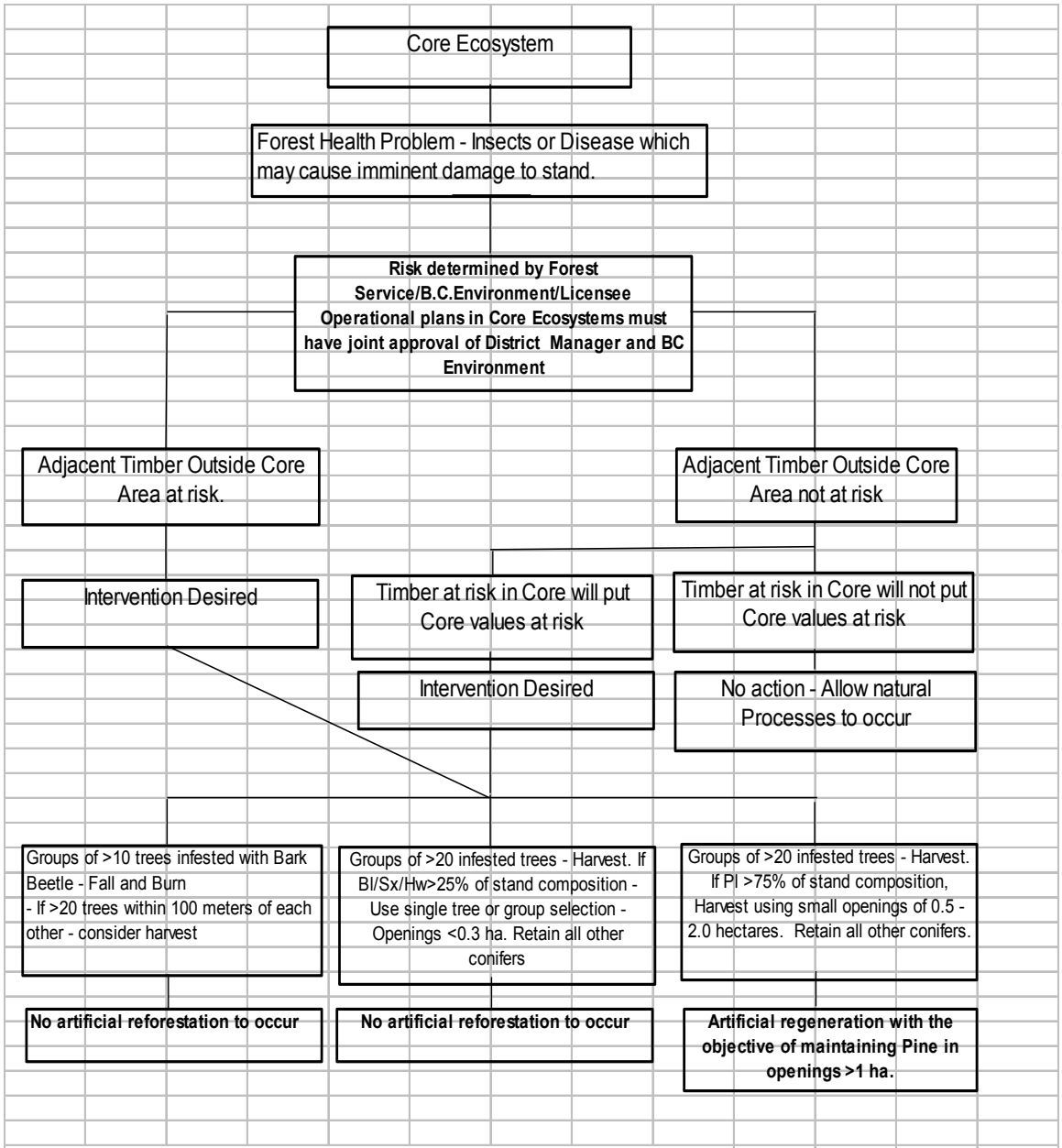
1. Allow natural processes of insect feeding or disease to occur within core ecosystems unless infestations or infections threaten to spread into areas outside the core ecosystem. If intervention is required, then low impact treatments such as fall and burn or modified harvesting are acceptable.
2. Do not permit harvesting in core ecosystems unless harvesting is necessary for the following reasons:

2.1. to address forest health problems (Figure 1), or

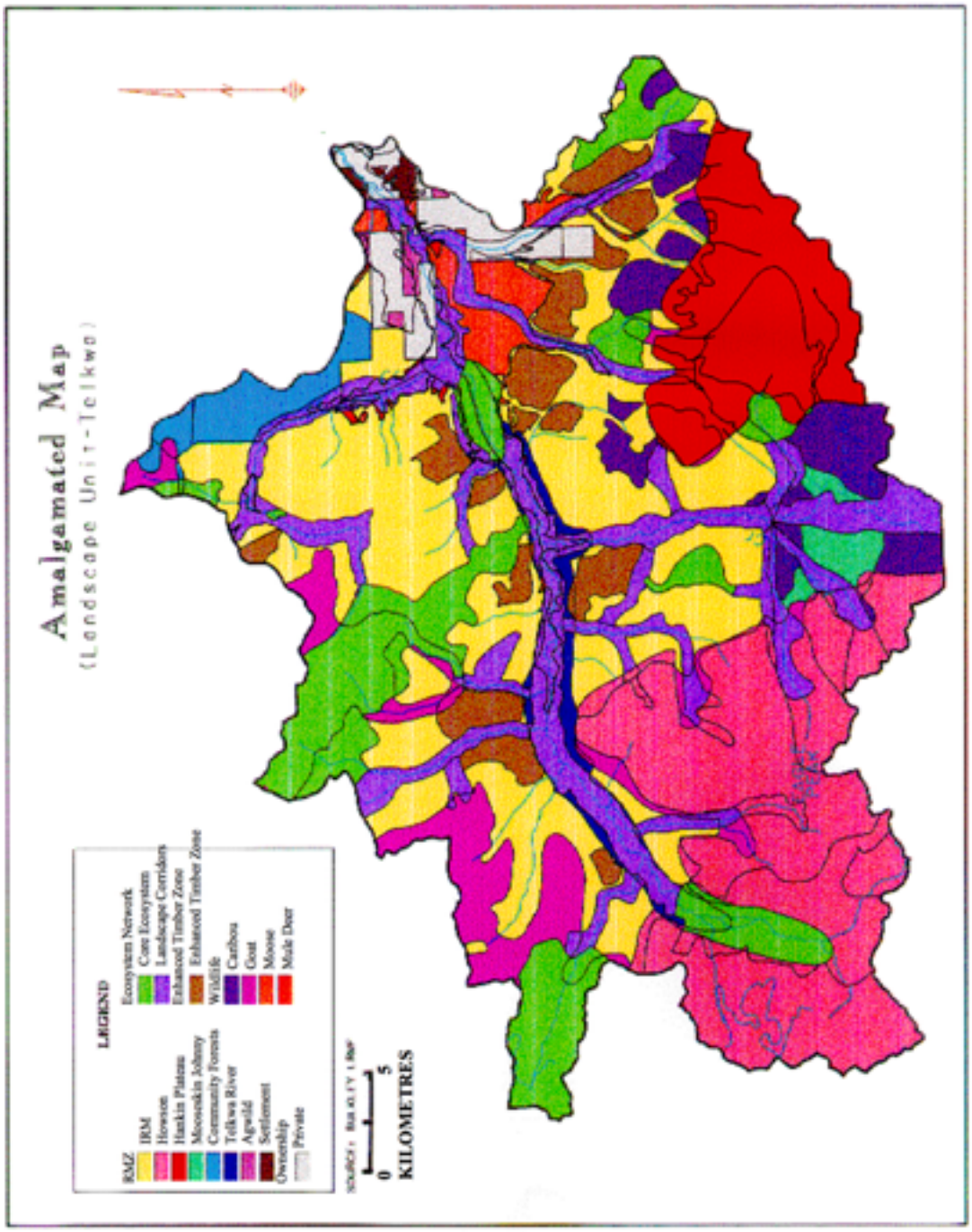
2.2. to permit incidental tree cutting for mining and exploration purposes.

3. If harvesting does occur, no roads can be built (employ long skids or helicopter logging) and modified harvest practices such as single tree selection (to maintain old growth structure) or small openings (<2 hectares to create or maintain early seral conditions) should be utilized (Figure 1).
4. Where alternative access is not possible, roads can be built through a core ecosystem to avoid alienating operable timber outside the core ecosystem.
5. Do not issue new grazing opportunities or boundary changes of existing grazing tenures in core ecosystems.
6. Allow natural processes to occur within core ecosystems, including the natural succession of existing early seral areas.

Figure 1. Decision Matrix for Harvesting in Core Ecosystems



Map 2. Amalgamated Map



Landscape Corridors

Objective # 1.2

Maintain within a managed forest setting, landscape corridors (Map 2) dominated by mature tree cover and containing most of the structure and function associated with old forest for:

i. providing habitat connectivity within the landscape, and
ii. permitting movement and dispersal of plant and animal species.

Strategies

1. Operational plans for harvesting within landscape corridors should consider the harvest pattern adjacent to the corridor. For example, clearcuts adjacent to the corridor will constrain harvesting strategies within the corridor. Conversely, modified harvesting adjacent to the corridor will increase the flexibility for harvesting in a corridor (Table 1).
2. Inoperable forested areas within landscape corridors contribute to landscape connectivity. This area will be considered when determining the amount of area to be harvested, and in analyzing the impacts to determine whether harvest plans meet the corridor objectives.
3. Access into landscape corridors should be temporary unless no other alternative is reasonable for ecological or economic reasons.

Table 1. Decision matrix for harvesting options in landscape corridors.

	Timber Type	Maximum Block Size Adjacent to Clear Cuts	Maximum Block Size Adjacent to Partial Cuts	Silviculture System/Mgt. Strategy	Objective	Adjacency
I	Pine (No understory)	1.5 ha. max. 0.3 to 1.5 ha.	3.0 ha. max. 1.5 ha. ave.	Patchcuts or Clearcut with reserve if operationally feasible (i.e., in larger openings)	Artificial Regeneration (Pine major)	No harvest until the block is 50 years old
II	Pine (Bl/Sx Pole size understory of good quality)	1.5 ha. - 3.0 ha. dependent on amount of pole size saplings (5 - 15 cm.)	1.5 ha. - 3.0 ha. dependent on amount of pole size saplings (5 - 15 cm.)	Overstory Removal with reserves where operationally feasible (i.e. in larger openings)	Natural Succession to Spruce/ Balsam stand	No harvest until opening provides sufficient forested attributes.
III	Hemlock Spruce/ Balsam (little or no understory)	Groups 0.3 - 1.5 ha. dependent on the snag component in the stand	3.0 ha. max. 1.5 ha. ave.	Patchcuts or clearcut with reserve if operationally feasible (i.e. in larger openings)	Mainly artificial regeneration Spruce/ Balsam	No harvest until opening provides sufficient forested attributes.
IV	Spruce/ Balsam with good quality varied stand structure	Single Tree or Group selection (0.3 to 1.5 ha.) maintaining approx. 70 % basal area . Single Tree if low snag %. Groups if high snag %.	Single Tree or Group selection (0.3 to 1.5 ha.) maintaining approx. 70 % basal area . Single Tree if low snag %. Groups if high snag %.	Retain approx. 70% of the unit. If the area outside the corridor is a partial cut, flexibility will be considered.	Natural Regeneration Site may be fully stocked after harvest .	Few constraints.

Seral Stage

Objective # 1.3

Achieve representation of ecosystems in old seral condition over time. Apply old seral retention targets as follows:

Table 2. Old Seral Stage Targets[6]

NDT	BEC Subzone	Min Age	% Forested Area
1	ESSFmk	250	>19
1	ESSFwv	250	>19
2	CWHws2	250	>9
2	ESSFmc	250	>9
3	SBSdk	140	>11
3	SBSmc2	140	>11

Strategies

1. Consider old forested areas that are inoperable or in core ecosystems SM1 or parks as contributing to the old targets.
2. Show through analysis or mapping that old seral targets are met following planned forestry activities.

Objective # 1.4

Maintain the natural age class distribution across the landscape unit. Apply mature plus old and early seral retention targets as follows:

Table 3. Mature plus old forest targets

NDT	BEC Subzone	Min. Age	% Forested Area
1	ESSFmk	120	>36
1	ESSFwv	120	>36
2	CWHws2	80	>34
2	ESSFmc	120	>28
3	SBSdk	100	>23
3	SBSmc2	100	>23

Reference: B.C. Forest Practices Code Biodiversity Guidebook

Table 4. Early seral targets

NDT	BEC Subzone	Max. Age	Early
1	ESSFmk	40	<22
1	ESSFwv	40	<22
2	CWHws2	40	<36
2	ESSFmc	40	<36
3	SBSdk	40	<54
3	SBSmc2	40	<54

Strategies

1. Consider mature and old forested areas in inoperable, core ecosystems, SM1, or parks as contributing to the mature plus old seral targets.
2. Show through analysis that mature plus old seral targets will be met and that early seral targets will not be exceeded following planned forestry activities.

Patch Size Distribution

Objective # 1.5

Attain a landscape pattern of development that represents the natural disturbance types in the landscape unit.

Strategies

1. Provide a range of opening sizes at the end of a rotation as per Table 5.

Table 5. Percent of forested area by NDT

	Patch Sizes	Patch Sizes	Patch Sizes
	<40 ha	40-80 ha	80+ ha
NDT 1	30-40%	30-40%	20-40%
NDT 2	30-40%	30-40%	20-40%
	<40 ha	40-250 ha	250-1000 ha
NDT 3	10-20%	10-20%	60-80%

2. Target larger (>60 hectares) early seral patches in Enhanced Timber Development areas.
3. The preferred order for achieving large cutblocks (>60 hectares) is:

3.1. to amalgamate existing blocks;

3.2. to enlarge existing cutblocks;

3.3. to create new cutblocks greater than 60 hectares.

4. Retain structural attributes in or adjacent to cutblocks by retaining wildlife tree patches and leave areas. Give consideration to increased retention in larger openings.
5. For larger blocks (>60 hectares), consider a group of blocks within 600 metres and 20 years of each other to be a single patch. For smaller blocks (<40 hectares), consider a group of blocks within 100 metres and 20 years of each other to be a single patch. These guidelines may vary based on other considerations.
6. Size range of leave areas should be the same as that for adjacent openings.

Coniferous and Deciduous Diversity

Objective # 1.6

Maintain a diversity of coniferous and deciduous species across the Telkwa Landscape Unit and throughout the rotation, that represents the natural species composition of each biogeoclimatic subzone.

Strategies

1. Site prescriptions should retain advanced regeneration, poles and saplings.
2. Where hemlock and balsam are not planted but are a primary or secondary species, as per the *Establishment to Free Growing Guidebook for the Prince Rupert Forest Region,* facilitate natural regeneration by ensuring these species are a component of wildlife tree patches scattered throughout larger openings.
3. Incremental silviculture activities should ensure that all existing ecologically acceptable species on site will be represented.
4. Where the preharvest stand has a major component (greater than 20%) of deciduous species, retain a portion of these species as either wildlife tree patches and/or reserve patches (wildlife tree patches can include the retention of single trees).
5. Where the preharvest stand had little or no deciduous component, but deciduous species have invaded naturally, design control measures so the presence of deciduous species will not be eliminated from the site while also recognizing that free-growing requirements must be achieved. Preferably, retain deciduous in a clumpy distribution.
6. Do not assist conversion of natural deciduous stands to coniferous species.

Stand Structure

Objective # 1.7

Provide structural diversity within managed stands by retaining attributes of old forests such as coarse woody debris, standing dead trees, and standing live trees.

Strategies

1. Retain wildlife tree patches (WTP) containing suitable wildlife trees at the time of harvest and during silviculture activities. Locate wildlife tree patches to provide a range of old forest stand structural attributes such as standing dead trees, standing live trees, coarse woody debris, and root wads. Patches should be distributed throughout the block with distances between patches (or other suitable leave areas outside the block) not normally exceeding 500 metres.
2. Retain wildlife tree patches with each block, independent of silviculture system, and approximately in the percentages in Table 6.

Table 6. Targets for Wildlife Tree Patch retention in cutblocks

BEC Subzone	% of cutblock to be retained as WTP
CWHws2	3
ESSFmc	3
ESSFmk	1
ESSFwv	1
SBSdk	3
SBSmc	7

3. Allow natural processes to occur within wildlife tree patches unless infestations or infections threaten to spread to non-wildlife tree patch areas. Where intervention is required, treatment will retain a diversity of structural attributes or a suitable replacement wildlife tree patch will be located.
4. Where possible, plan wildlife tree patches:

4.1. to retain deciduous as well as coniferous trees,

4.2. to retain some large, old trees,

4.3. to provide connectivity within the cutblock,

4.4. to provide structure in riparian management areas, and

4.5. in areas already constrained.

5. Retention of coarse woody debris outside identified wildlife tree patches, core ecosystems and riparian reserve zones should not exceed utilization standards.

Wildlife

Mountain Goat

Objective # 2.1

Provide for thermal and snow interception cover and forage for wintering goat populations in areas near identified habitat shown on Map 2.

Strategies

1. Spatially and temporally distribute blocks and design blocks so forested connectors are maintained between mountain ranges in Kotsine Pass.
2. Harvesting within 200 metres of identified mountain goat habitat should either mimic small, natural openings (<5 hectares) if clearcut or be harvested with non-clearcut systems.

Objective # 2.2

Provide for security for mountain goat from an unregualed harvest in important mountain goat habitat identified on Map 2.

Strategies

1. Do not locate main haul roads within one km of identified mountain goat habitat or establish an access control point to limit access to this habitat.
2. Restrict access on spur roads to within one km of identified mountain goat habitat by using a deactivation strategy, access control point or temporary roads. Access restrictions must be in place prior to harvesting and after planting.
3. Avoid harvesting within 200 metres of goat habitat from April 15 to July 15 to avoid disturbing goats during the natal time period.

Moose Winter Range

Objective # 2.3

Ensure forage is retained and available in identified moose winter range identified on Map 2.

Strategies

1. Relaxed stocking standards or increased free to grow windows should be considered to allow for deciduous forage in conifer leading stands.
2. Retain woody forage species (e.g. willow, dogwood, saskatoon, mountain ash, highbush cranberry, etc.) where not inhibiting crop tree growth or where they occur in and around riparian areas.
3. Maintain deciduous patches throughout larger blocks, particularly in locations where conifer establishment is poor or deciduous patches are dominated by high value forage species (e.g. willow, dogwood, saskatoon, mountain ash, highbush cranberry, etc.).
4. In large, existing cutblocks, leave or manually brush the deciduous component that is close to forested cover and away from roadsides.
5. Limit livestock grazing on shrubs in late summer, whether it be for range purposes or vegetation management.

Objective # 2.4

Provide for security, visual, thermal and snow interception cover within identified moose winter range shown on Map 2.

Strategies

1. Clearcuts should have a high edge ratio (perimeter to area) and retain reserves and unmerchantable trees to provide security cover.
2. Retain visual screening along roads and within blocks adjacent to roads to protect moose from view if blocks to be harvested contain high-value forage species (e.g. willow, dogwood, saskatoon, mountain ash, highbush cranberry, etc.).
3. Maintain visual screening along road right-of-ways (when accessible by four wheel drive) when spacing, pruning and/or brushing. Once the interior of the block offers visual cover, the buffers can be treated.
4. Locate roads away from riparian areas and natural openings. If operational constraints require roads to be located close to these areas, then provide visual screening to reduce vulnerability of moose in the winter and to avoid alienating the habitat.
5. Windrows and brush piles should be discontinuous to avoid constraining wildlife movement.
6. Maintain conifer groups in deciduous dominated stands.

7. Distribute harvest throughout the winter range to provide forage through a rotation.

Caribou

In 1997, BC Environment, following LRMP direction, developed a comprehensive plan to sustain and enhance a viable caribou population within the Telkwa mountains. The Telkwa Caribou Herd Recovery Plan (TCHRP) introduced management actions designed to:

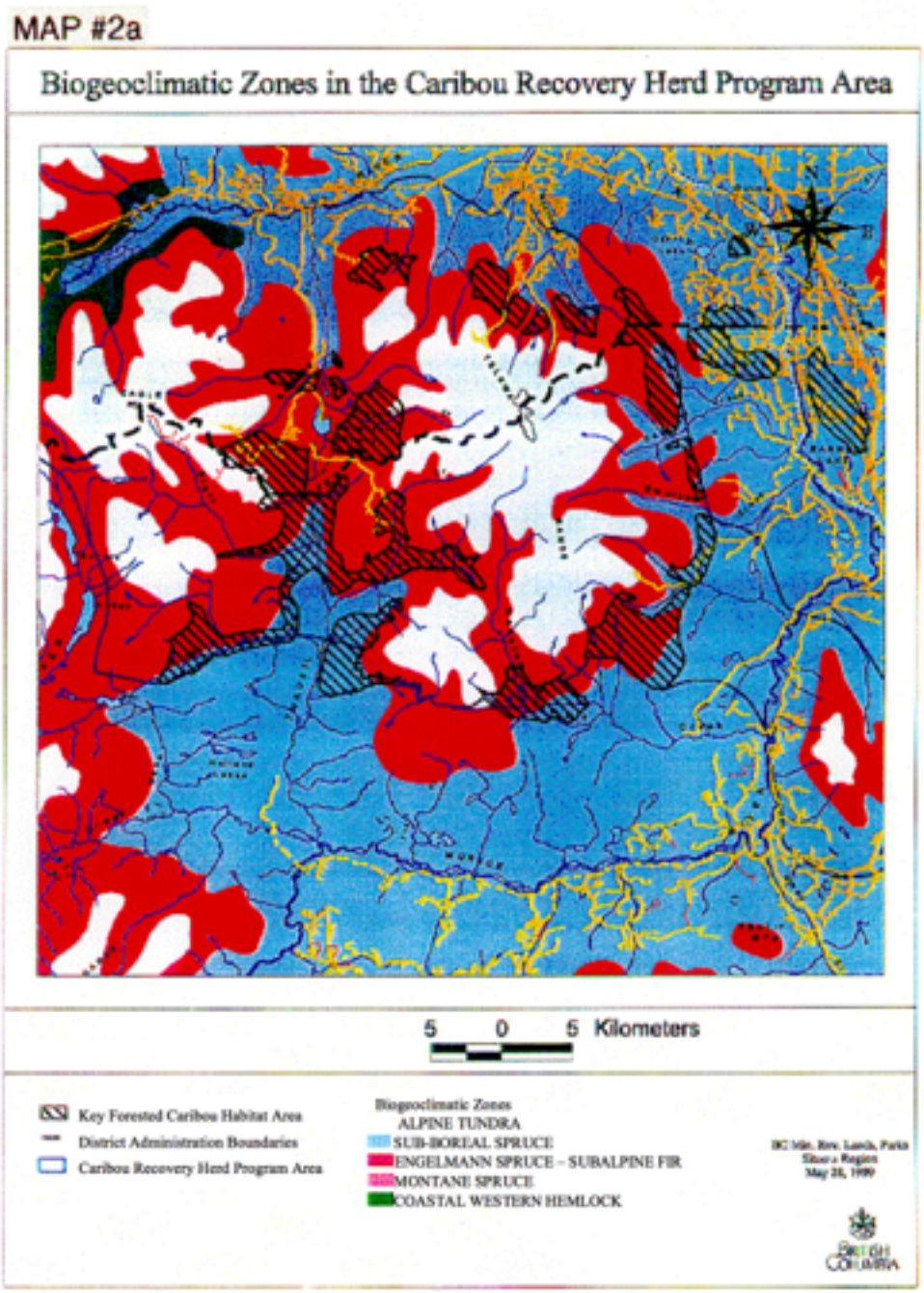
1. reverse recent declines in population size by augmenting the herd with caribou from other populations,
2. recommend a recreational access management plan, and
3. protect caribou habitat by utilizing existing land zonation and by modifying industrial activities to compliment caribou recovery.

Successful caribou relocations were conducted in 1997 and 1998.

LRMP special management zone one and two zones, landscape corridors and core ecosystems all contribute to a caribou landscape strategy for the Bulkley TSA. Within the LRMP integrated resource management zone, caribou management objectives and strategies were developed for the biogeoclimatic zones covering the TCHRP area. Furthermore, areas known to be important to caribou ("Key Forested Caribou Habitat") have been identified and mapped (Map 2 a).

The following objectives, strategies and harvest decision matrix (Table 7) provide direction to integrate forest harvesting practices and caribou recovery plans.

Map 2 a Biogeoclimatic Zones in the Caribou Recovery Herd Program Area



Objective #2.5

Provide for security cover, forage and large areas of inactivity over a rotation within the Telkwa Caribou Herd Recovery Area (TCHRPA) identified in Map 2 a.

Strategies

1. Consider uneven aged harvesting or selection harvest systems.
2. Centralize harvest by combining harvest blocks into larger sized aggregates, thereby reducing landscape fragmentation and road densities.
3. Identify on forest development plan maps similar sized leave areas to offset aggregate harvest and to provide for large areas of inactivity for caribou use.
4. Identify arboreal lichen abundance in areas proposed for timber harvest (using "Estimating the Abundance of Arboreal Forage Lichens - Field Guide Insert 7"). Retain moderate to high lichen bearing conifer stands (classes of 3,4, and 5), in wildlife tree patches, within block leave areas or areas outside of block aggregations.
5. In harvested areas locate wildlife tree patches and forested reserves around riparian areas, arboreal lichen stands, swamp and meadow complexes.
6. Where feasible retain all poles, saplings, natural regeneration and live non-merchantable trees. When in-block retention of poles, saplings, regeneration and live non-merchantable trees rates are low, increase forested reserve amount.
7. When planning block layout for aggregates and leave areas allow for caribou movement by retaing mature forest between lowland and upland sites and between wetland and meadow complexes.

Objective # 2.6

Within a managed forest setting, provide for critical caribou habitat and forage by retaining Key Forested Caribou Habitat identified on Map 2 a. with mature and old characteristics.

Strategies

1. Distribute forest harvesting over several passes.
2. Follow strategies identified in Table 7.

Table 7. Harvesting and Access Strategy for Telkwa Caribou Recovery Area

	Stand Level			Landscape	Access
	Approx. Forest Leave Areas in aggregate	Approx. Opening Size in aggregate	Aggregate Size	Seral Stage Objectives	
Key Forested Caribou Habitat	50%	1-3 ha	Limited by landscape feature	Max 50% area < 90 yrs old	Emphasis temporary roads 4X4 access restricted Treed reserves
4X4 access restricted means removing a bridge or culvert at suitable locations in or adjacent to key forested or subalpine caribou habitat. Treed reserves means a forest barrier between roads, cut block and easily accessible subalpine that will limit snow machine and ATV access.					
Preferred operating season is July - Nov 1. Second option is one active all season harvest area in key forested caribou habitat at any one time with emphasis on getting in and out as quickly as possible.					
ESSF General	30%	3-15 ha	Limited by landscape feature	LUP ESSF Seral Stage objectives	4X4 access restricted (only when necessary) Treed reserves
Wildlife Tree patches in all SBS and ESSF aggregates should focus on key caribou features.					
Partial Cutting systems are acceptable and even preferred where appropriate in the ESSF.					
SBS General	20%	15-35 ha	Limited by landscape feature	LUP SBS Seral Stage objectives	
Where non aggregated blocks are chosen in the SBS which are larger than 35 hectares, the block design will emulate Natural Disturbance Type 3 with a minimum level of forest leave areas within blocks of 20%. These leave areas will focus on key caribou features such as wetlands, meadows and moderate/ high lichen bearing stands.					
Leave areas **between** aggregates will be similar in size as the aggregates themselves and must be identified on Forest Development Maps. Forest leave areas **in** aggregates will be suitable for future harvest and accessible from existing road development. Forest leave areas **in** aggregates will remain part of the timber supply.					
Where high value caribou habitat is identified outside the key forested caribou habitat it should be reviewed to determine management direction.					
This matrix outlines even aged harvesting options only. Uneven aged harvesting over even larger aggregates should be considered, if all of the issues around stand, landscape, and access are addressed favourably					

Objective # 2.7

Within the ESSF Biogeoclimatic zone in the TCHRP area, emulate natural disturbance patterns by creating small openings with irregular edge configurations.

Strategies

1. Follow strategies identified in Table 7.

Objective # 2.8

Within the SBS Biogeoclimatic zone in the TCHRP area, emulate natural disturbance patterns by creating large aggregate blocks while providing for caribou forage and screening.

Strategies

1. Follow strategies identified in Table 7.

Objective #2.9

Avoid caribou displacement, reduce human, caribou and predator interaction, and encourage caribou use of the TCHRP area.

Strategies for Key Forested Caribou Habitat identified on Map 2 a.

1. Establish access restrictions following block planting. Access restrictions should be in place within two years of block harvest.
2. Follow strategies identified in Table 7.

Strategies For the ESSF Biogeoclimatic zone identified on Map 2 a.

3. Where roads or cutblocks provide easy of access to the sub-alpine slopes, access restrictions for four wheel drive vehicles will be implemented (bridge or culvert removal).
4. Maintain forested barriers between roads or cutblocks and easily accessible sub-alpine slopes.
5. Where feasible, retain visual screening along roadsides expected to be maintained through winter time periods.
6. Follow strategies identified in Table 7.

Objective #2.10.

Limit access to protect caribou habitat (alpine and subalpine) surrounding Mooseskin Johnny Lake and its wetlands.

Strategy

1. Establish an access control point below Scallon Creek, restricting motorized traffic in the Mooseskin Johnny corridor as identified on Map 3.

Fish

Fish Habitat

Objective # 3.1

Retain structure within the riparian management zone to reduce the risk of windthrow to the reserve zone. Retain structure within the riparian management zone to provide shade and maintain natural channel and bank stability.

LRMP Special Management Zones

The Bulkley LRMP designated the Howson Range, the Hankin Plateau, Mooseskin Johnny Lake, the Telkwa River and the Community Forest as special managment zones. Some special management zones may not have objectives under this section if other objectives in other sections cover off the special management zone.

The Howson Range was designated as a special management zone one (SM1) to maintain caribou and goat habitat, and to maintain visual quality as seen from the ski hill and Highway 16. This is managed through Objective #4.1 of this section and visual quality Objective #7.2.

The Hankin Plateau was designated special management zone one (SM1) to sustain and enhance a viable caribou population and to manage visual quality. Visual quality is managed through Objective #4.2 of this section as well as visual quality Objectives #7.1 and #7.2.

Mooseskin Johnny (LRMP sub-unit 11-1) was designated special management zone two (SM2) to protect caribou habitat and to maintain the existing commercial back country tourism operation, while still allowing industrial activity to occur. Objectives to protect these resources are Objective #7.2 for visual quality and Objectives #2.5 to 2.10 for wildlife.

TheTelkwa River (LRMP sub-unit 11-5)was designated special management zone two (SM2) to maintain water quality for fisheries, wetlands, and for deer and grizzly bear habitat. The majority of this zone is maintained through the ecosystem network Objectives #1.1 (core ecosystems) and #1.2 (landscape corridors), which with their harvesting restrictions provide forest cover for wildlife.

The Community Forest is designated special management zone two (SM2) to provide community recreation and education in a demonstration forest. Any operational plans for this area must follow the Smithers Community Forest Steering Committee Plan.

Howson Range

(SM 1, LRMP sub-unit 11-1)

Objective # 4.1

Maintain the caribou and goat habitat and visual quality values while allowing for continued exploration and development of high mineral potential in the Howson Range special management zone (Map 2).

Strategy

1. Limit tree cutting only to that required for approved mineral exploration and development purposes including access.

Hankin Plateau

(SM 1, LRMP sub-unit 11-2)

Objective # 4.2

Sustain and enhance a viable caribou population and manage visual quality values while allowing for continued exploration and development of high mineral potential in the Hankin Plateau Special Management Zone (Map 2).

Strategy

1. Limit tree cutting only to that required for approved mineral exploration and development purposes including access.

Timber

The Telkwa Creek Landscape Unit contains approximately 14% of the Timber Supply Area (TSA) contributing landbase.

The LRMP identified Enhanced Timber Development (ETD) areas within the operable landbase where the intent is to increase the available timber supply and to improve timber quality. The management for the timber resource is a high priority within these areas.

Therefore, they are located where there is low conflict with other values and where there is high potential for timber growth (Map 2). It is anticipated these areas may provide a framework for an intensive silviculture strategy and that they will be targeted for available intensive management funding (Objective #5.3).

Timber Supply

Objective # 5.1

Produce a long term secure supply of timber that is economically achievable, and ensure productive ground, in the timber harvesting landbase, is actively growing timber.

Strategies

1. Slow growing, poor quality balsam and hemlock stands on productive sites should be targeted for harvesting and replaced with thrifty growing managed stands.
2. All backlog Not Sufficiently Re-stocked (NSR) areas must be reforested as soon as possible.
3. Prescriptions will encourage a reduction in the time to regenerate harvested areas.

Objective # 5.2

Maintain the health and productivity of the timber resource.

Strategy

1. Salvage of damaged or diseased timber should occur as soon as possible in an economic and efficient manner according to objectives of the area.
2. Identify and use harvesting and silviculture techniques that limit the spread of forest disease and pests which reduce the value and volume of forest stand.
3. Results of annually monitored beetle activity shall be used to identify high priority harvesting blocks in five year development plans.

Enhanced Timber Development Areas

Objective # 5.3

Intensively manage the timber resource in all Enhanced Timber Development (ETD) areas shown in Map 2, to reduce the rotation and/or increase yield per hectare over time, in accordance with approved funding allocations

Strategies

1. Target ETD areas for some or all of the following intensive silviculture treatments:

1.1. using genetically improved seed or superior planting stock;

1.2. pre-commercial and commercial thinning;

1.3. pruning;

1.4. fertilizing; and,

1.5. intensive brushing and weeding.

2. Uphold visual quality objectives where noted in ETD areas.

3. Identify high wildlife use areas (e.g. goshawk nests, mineral licks) at the stand level and either develop management techniques that maintain their specific values or consider for deletion from ETD area.

Recreation

Where logging blocks and/or roads are proposed over recreation trails, licensees will be required to consult with local outdoor organizations in the manner outlined in Section 7 of the Operation Planning Regulation of the *Forest Practices Code of British Columbia Act*.

Trail Management

Objective # 6.1

Ensure known trail locations as identified in Table 8 are passable, accessible, and identifiable after logging.

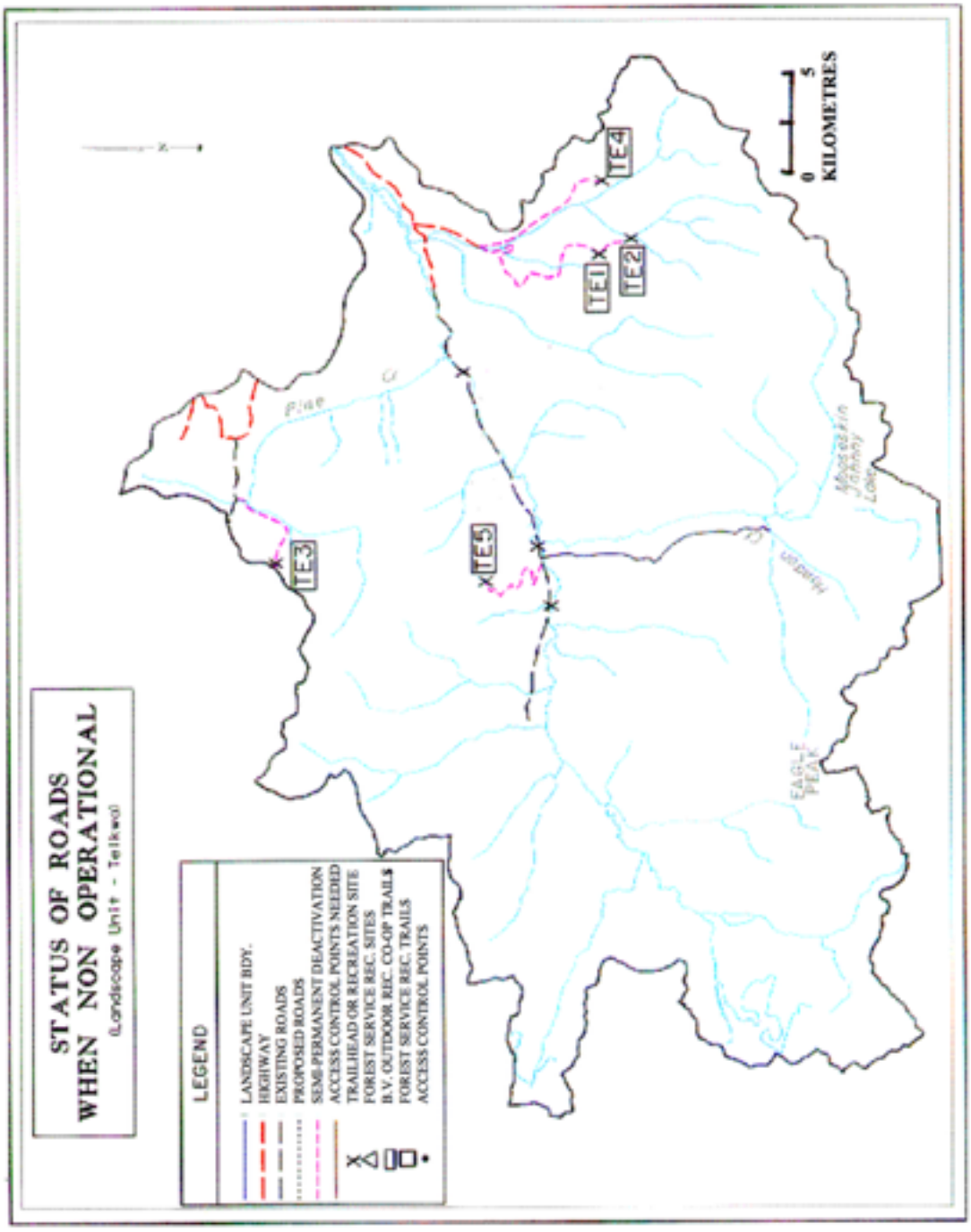
Table 8. Recreation Trail List (Trail heads)

Trail	Location
Camel Humps Trail	1200 road between CP 598-5 &6
Webster Lake Trail	To south end of CP 598-1
Pine Creek/Mt. Leach Trail	FSR 8639
Goathorn East Trail	To south end of CP 598-1
Microwave Tower	0-6km on RO9521 sec 120(Windfield Creek Rd)
Mooseskin-Johnny Road	FSR 1000 Km 19(Howson Creek Rd/Trail)
Hankin Plateau Recreation Trail	

Strategy

1. Mark the original trail bed prior to logging, relocate the trail head following logging and clear the trail, by had if necessary, as part of operations.
2. In some instances it may be preferable to establish a new trail head after harvesting. In this situation an acceptable trail plan must be approved prior to harvesting.
3. Place signs so trails can be followed through blocks.

Map 3. Status of Non-operational Roads



Recreational Access

Objective # 6.2

Maintain reasonable opportunity for access to existing recreational destinations as identified in Table 9.

Table 9. Recreational Destinations (Trail heads)

Trail	Location	Map Symbol
Camel Humps Trail	1200 Rd between CP 598-5 &6	
Webster Lake Trail[7]	To south end of CP 598-1	
Pine Creek/Mt. Leach Trail	FSR 8369	
Goathorn East Trail[7]	To south end of CP 598-1	
Microwave Tower	0-6 km on RO9521 sec 120(Winfield Cr. Rd.)	

Strategies

1. When operations have ceased, permanently deactivate on-block roads unless the road provides access to a recreational destination. In this case, semi-permanently deactivate the roads to allow drive-through by pick-ups or equivalent type of vehicle to recreational destinations listed in Table 9and shown on Map 3.
2. When operations have ceased, semi-permanently deactivate non-mainline roads which provide access to a recreational destination, to facilitate drive through by pick-ups or equivalent type of vehicles, as shown on Map 3.
3. When locating and designing landings, consider the opportunity for parking near trailheads listed in Table 8 and identified on Map 3.

Visual Quality

Visual aesthetics in the Telkwa Landscape Unit are a high priority due to this unit being visible from both Highway 16 and the Ski Hill.

The Bulkley LRMP states that the scenic resources in the district are critical to the viability of the tourism/recreation sector and to the quality of life of area residents. Applying creative block design and alternative silviculture prescriptions to create an interesting landscape is the preferred management strategy.

The LRMP recommends that the following scenic resources be addressed in the landscape unit plan as part of the normal planning process, with special attention given to the following: major corridors, recreation focus points, and specific viewpoints.

It is important to manage the visual resources from the viewpoints that were specified in the Bulkley LRMP (Map 4). Hence, visual quality objectives are being established for the scenic areas that were identified using visual landscape inventories (VLI) from those specified viewpoints.

Visual Quality Objectives (VQOs) are acceptable degrees of change from the natural appearing landscape caused by land-use alterations, such as logging or road building. Operational Plans such as Forest Development Plans and Access Management Plans must show they are consistent in achieving these VQOs.

Modification

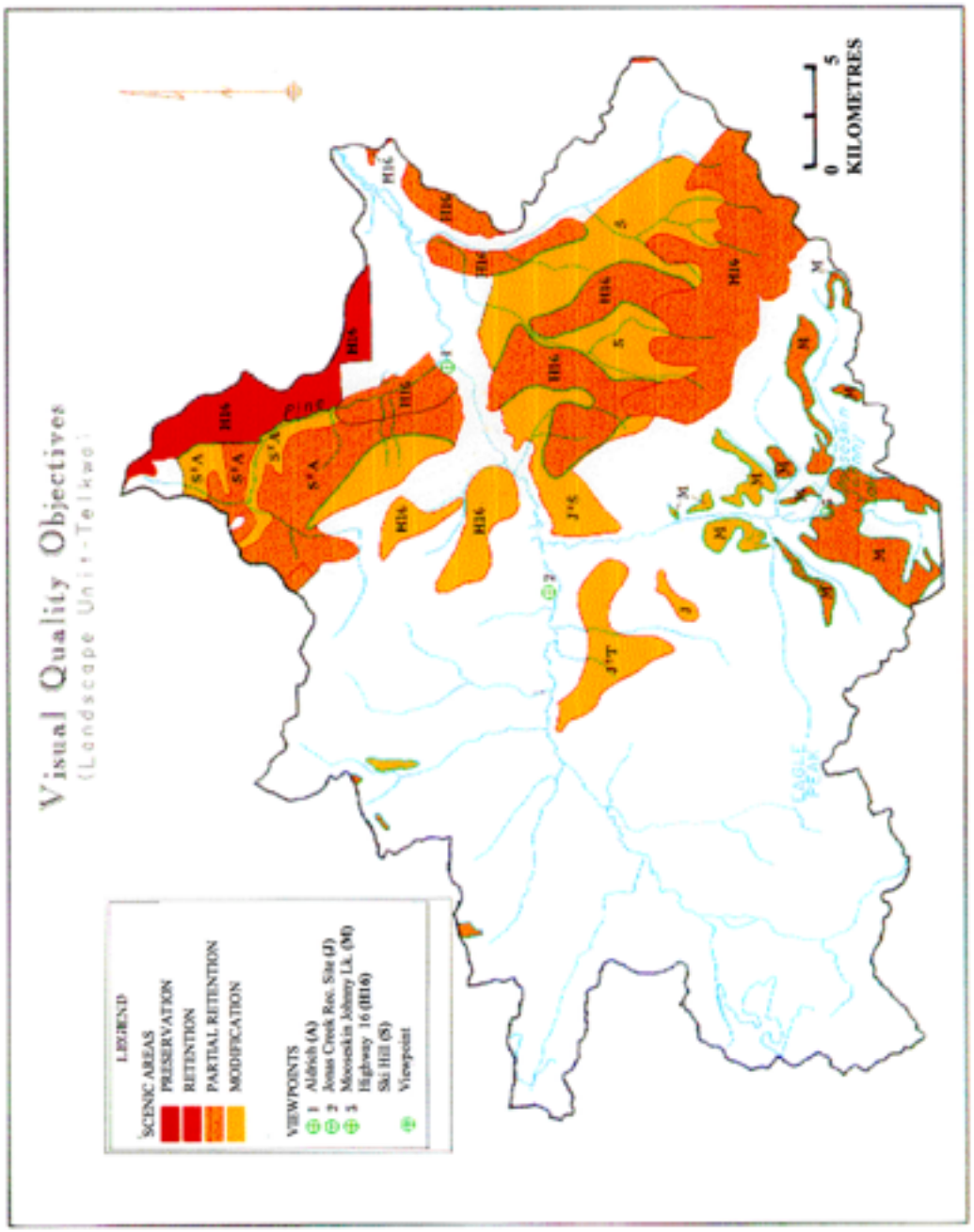
Objective #7.1

Forest Management activities in modification areas identified on Map 4 must have natural appearing characteristics and blend in with existing landforms.

Strategies

1. Alterations must borrow from natural line and form to such an extent and on such a scale that they are comparable to natural occurrences.
2. Openings will exhibit elements of good block design which may include: strategic placement of leave trees and patches, feathered edges, and borrowing lines from the natural character of the landscape.
3. Visually effective green-up shall be 3 metres.
4. Alternative systems will be considered where stand structure is suitable.
5. Select a technique (i.e. sketch, photographic manipulation or computer model (DTM)) and prepare a Visual Impact Assessment (VIA) for each design option. Consult the forest district if there is any doubt as to the technique necessary for a given operation.
6. VIA's must be done from viewpoints as identified on Map 4.

Map 4. Visual Quality Objectives



Partial Retention

Objective #7.2

Forest management activities in partial retention areas as identified on Map 4 may be noticeable but must blend well with the natural appearance of the landscape.

Strategies

1. Alterations must borrow from natural line and form to such an extent and on such a scale that they are comparable to natural occurrences.
2. Openings will exhibit elements of good block design including: strategic placement of leave trees and patches, feathered edges, and borrowing lines from the natural character of the landscape.
3. Alternative systems will be considered where stand structure is suitable.
4. Where visible openings are created, silviculture prescriptions will incorporate treatments to reduce the time to visually effective green-up(5 metres).
5. Select a technique (i.e. photographic manipulation or computer model (DTM)) and prepare a Visual Impact Assessment (VIA) for each design option. Consult the forest district if there is any doubt as to the technique necessary for a given operation.
6. VIA's must be done from viewpoints as identified on Map 4.

Retention

Objective # 7.3

Forest management activities in retention areas as identified on Map 4 may be discernible but not clearly visible to the average viewer. Disturbances should appear to be from natural causes.

Strategies

1. Alterations must borrow from natural line and form to such an extent and on such a scale that they are comparable to natural occurrences.
2. Openings will exhibit elements of good block design including strategic placement of leave trees and patches, feathered edges, and borrowing lines from the natural character of the landscape.
3. Alternative systems will be considered where stand structure is suitable.
4. Select a technique (i.e. photographic manipulation or computer model (DTM)) and prepare a Visual Impact Assessment (VIA) for each design option. Consult the forest district if there is any doubt as to the technique necessary for a given operation.
5. VIA's must be done from viewpoints as identified on Map 4.

Access

Objectives and strategies relating to access can be found in various sections throughout the Telkwa Landscape Unit Plan. Table 10 is a comprehensive list of all objectives and strategies relating to access in the Telkwa Landscape Unit.

The Ministry of Energy and Mines must be consulted on permanent deactivation plans at the forest development planning stage, to determine current use under permit for mineral exploration and development.

Table 10. Objectives and Strategies Relating to Access

SECTION	OBJECTIVE TITLE	OBJECTIVE #	STRATEGY #'s
Biodiversity	Core Ecosystems	1.1	3, 4
Biodiversity	Landscape Corridors	1.2	3
Wildlife	Mountain Goat	2.2	1, 2
Wildlife	Moose Winter Range	2.4	2-4
Wildlife	Caribou	2.5	2
Wildlife	Caribou	2.6	2
Wildlife	Caribou	2.7	1
Wildlife	Caribou	2.8	1
Wildlife	Caribou	2.9	1-6
Wildlife	Caribou	2.10	1
LRMP SMZ	Howson Range	4.1	1
LRMP SM	Hankin Plateau	4.2	1
Recreation	Recreational Access	6.2	1, 2

Implementation, monitoring and review

Implementation

Compliance with the LRMP

1. The landscape unit plan will be sent to appropriate government agencies to ensure compliance with the Bulkley Land and Resource Management Plan.
2. Future amendments to the plan must take direction from the LRMP.
3. No additional constraints to timber supply will be applied without considering the LRMP budget (see "Introduction" section for explanation of 'LRMP budget').

Plan implementation and transition strategy

1. Once approved by the District Manager (DM) of the Bulkley/Cassiar Forest District and the Designated Environment Official (DEO), the plan will be distributed to appropriate stakeholder groups and government agencies (Pacific Inland Resources, Skeena Cellulose Inc., Northwood Pulp and Timber Ltd., First Nations, the Ministry of Agriculture, Fisheries and Foods, the Ministry of Environment, Lands and Parks and the Ministry of Employment and Investment, Mines Division).
2. Agencies will work with licensees and other resource users on incorporating the guidelines of this plan into operational planning.

Transition strategy

The landscape unit plan establishment process includes a public review and comment period, approval of the plan by the Designated Environment Official, sign off by the District Manager (Ministry of Forests) and filing of the plan with the Regional Manager (Ministry of Forests). The objectives of the landscape unit plan are *legally established* as per the establishment date stated in the *Order to Establish* pages found at the beginning of each landscape unit plan.

The Forest Practices Code of British Columbia Act (FPC Act) includes several sections with higher level plan requirements including FPC Act s. 9.1, s.10(1)(d), s.11(c), s.12(b) and (c), s. 13(b) and s.16(b) and under Operational Planning Regulations sections 20, 21, 22 and 23. Table 11 represents a summary of transition requirements for Operational Plans in this landscape unit.

Table 11. Summary of transition requirements for Operational Plans

Stage of approval	Requirement for compliance with the plan
Awarded Timber Sale Licences/ issued Cutting Permits	Exempt (as per OPR s. 22 (1))
Category A-blocks and roads in an approved Development Plan (prior to 4 months after objective has been established)	Exempt (note: with this section of the table the DM is exempting these plans from OPR s. 21(1).)
Non-Category A blocks and roads and other new plans.	Must be in compliance

First Nations

The Bulkley Forest District recognizes that Landscape Unit Planning may be an effective level of planning for addressing many First Nations forest management concerns. At this stage, however, the Landscape Unit objectives and strategies in the Bulkley Forest District do not include First Nations input. These objectives and strategies have been developed strictly to implement the Bulkley LRMP. First Nations have been advised of the LUP process and have been invited to comment on draft Landscape Unit Plans, but have not been actively involved in their development.

This is now changing and there is currently interest in exchanging information between MOF and First Nations at the landscape unit level of planning. It is hoped that reccurring forest planning issues can be dealt with at this level to diminish concerns encountered at the Operational Planning level.

The Wet'suwet'en First Nation's traditional territory covers the majority of the Bulkley Timber Supply Area, occupying area in all landscape units except the Babine and Nilkitkwa landscape units. Currently the Bulkley Forest District is working with the Wet'suwet'en on a landscape unit planning project to gather information on Wet'suwet'en historical and current values associated with the land in their traditional territory. Integrating these values into Landscape Unit Plans may result in a future amendment to the Landscape Unit Plans.

Interaction with the Gitxsan and Fort Babine First Nations is less involved. Currently they are aware that objectives and strategies are being established and are invited to submit comments. As well, the Gitxsan are discussing involvement in landscape unit planning at the Land and Resources working group meetings. The option to add on and amend Landscape Unit Plans to accommodate new information as it becomes available (eg., cultural heritage resource values) remains open.

Monitoring

MOF and MELP commit to best efforts in developing a monitoring strategy for each type of landscape unit objective to determine if the objectives are being met. MELP will be responsible for developing a monitoring methodology for wildlife, biodiversity and fish objectives. MELP and MOF will be responsible for developing a monitoring methodology for the LRMP Special Management Zone objectives and MOF will be responsible for developing the methodology for the timber, recreation, visual quality and range objectives. This monitoring will be done in conjunction with the Interagency Management Committee's (IAMC) strategy for monitoring the Bulkley's LRMP. The Community Resources Board(CRB) is expected to be an active participant in the monitoring and amendment phases.

In the interim it is recognized that monitoring, in a more simple sense, will be ongoing, and that issues may arise at any time that may warrant revisiting these objectives.

Plan review and amendment

This landscape unit plan will be amended as required to reflect new information from monitoring and experience from operational plans as landscape unit objectives and strategies are implemented. Amendments may be required to incorporate new information (e.g. inventories, details for single species management), lake classification, First Nations interests, watershed assessments, etc. Amendments may also be required to provide further detail in strategies to meet objectives. Future amendments of the landscape unit plans will include the details of the monitoring strategies once they are developed. Amendments will be completed as per the Forest Practices Code and Higher Level Plan procedures.

The District Manger will consider amending the boundary of ETD areas if other objectives or values have a significant impact. Possible reasons include significant wildlife use areas and significant impacts due to visual quality objectives. Any such deleted and replacement areas will be itemized and submitted with operational plans for tracking purposes .

Ecosystem network amendments will be by joint agreement between the district manager and the MELP district biologist. For example, amendments to the ecosystem network may be necessary when:

1. more specific ecological information about an area is acquired,
2. rare and endangered species habitat is identified but not already well represented by the ecosystem network (Appendix I)
3. mine exploration or development affects the existing core ecosystem objectives and attributes,
4. monitoring indicates a need for a boundary change.

Changes to the ecosystem network will include an appropriate transition strategy and impact on a licensee's operating area.

A future amendment will be required to incorporate the results from the work with the Wet'suwet'en and other First Nations. As well, a complete review of the objectives will occur within 3 years of the establishment date. An interagency team (including affected Licensees) will be assembled to review the plan, to review the results of monitoring these objectives and to recommend improvements.

Appendices

Appendix I. Red and Blue Listed Species Likely in the Telkwa Landscape Unit

Common Name	BEC Site series	Provincial Rank
Amabilis Fir/Western Red Cedar - Oak Fern	CWHws2/04	Blue
Amabilis Fir/Western Red Cedar - Devil's Club, Wet Submaritime	CWHws2/06	Blue
Subalpine Fir/Lodgepole Pine - Juniper - Lichen	ESSFmc/02	Blue
Subalpine Fir/Lodgepole Pine - Cladonia	ESSFwv/02	Blue
Subalpine Fir - Huckleberry - Crowberry	ESSFmc/03	Blue
Saskatoon-Slender Wheat Grass	SBSdk/81	**RED**
Black Spruce/Lodgepole Pine - Feathermoss	SBSmc2/03	Blue
Sitka Spruce - Salmonberry, wet submaritime 2	CWHws2/07	**RED**
Subalpine Fir/Whitebark Pine - Cladonia	ESSFmk/02 ESSFmk/03	Blue
Lodgepole Pine - Kinnikinnick	CWHws2/02	Blue
Lodgepole Pine - Juniper - Ricegrass	SBSdk/02	Blue
Lodgepole Pine - Sphagnum, Wet Submaritime 2	CWHws2/10	Blue
Bluegrass - Slender Wheatgrass	SBSdk/82	**RED**
Cottonwood - Red Osier Dogwood	CWHws2/08	Blue
Paper Birch - Black Twinberry Fluvial Forest	SBSdk/07a - seral association	***RED***
Hybrid White Spruce - Horsetail floodplain forest	SBdk/07	***RED***[8]
Hybrid White Spruce - Horsetail floodplain forest	SBSdk/07b	***RED***[8]
Cottonwood - Dogwood - Prickly Rose	SBSdk/08	**RED**
Douglas-Fir - Feathermoss - Stepmoss	SBSdk/04	Blue
Pacific willow - Mountain Alder - Lady Fern	SBSdk	*Blue*[8]
Black Cottonwood - Hybrid White Spruce - red osier dogwood - prickly rose floodplains	SBSmc2	*Blue*[8]
Timber Oatgrass dry grassland	SBS/ESSF	***RED****(Blue)*[8]
Mesic (montane) forb meadows - variable spp. Composition	all interior zones except AT	***RED****(Blue)*[8]
Cow parsnip - large leaved avens - stinging nettle - brome lush meadows	SBS/ICH/CWH	*Blue*[8]

Appendix II. Ecosystem Network Summary of the Telkwa Landscape Unit

Core Ecosystems

Location	Area (ha)	Rationale						
		Biophysical	Species	Age Class	NP Description	Wildlife	Rare and Endangered Spp.	Comment
Telkwa/ Bulkley Confluence	65	SL/SLc	Aspen	6	Cultivated			
Miller Creek Headwaters	270	EF	Balsam Pine	8 4	Alpine/ Alpine Forest			− old fire − connectivity from Copper River to alpine
Pine Creek	35	SF	Balsam	8				− excellent example of old growth Balsam Std.
Upper Telkwa	5180	EW/FR	Balsam Hemlock	8/9 8	Alpine	G		− High fishery values − Telkwa River Headwaters − Forested Pass into Burnie Lakes area (Morice District)
Milk Creek	2725	EWs/ AUs/GL	Balsam	8	Alpine	G		− Milk Creek Headwaters
Microwave	5850	EF/AM/ EW	Balsam Pine	4/8/9 8	Alpine	G		
Telkwa River	860	SFm/SF	Aspen Balsam	4 8		M/ MD		− Large deciduous stand on north shore, old growth balsam on south shore
Goathorn	1220	EF	Balsam Pine	4/7/8 5		C/ G		− meadow complex − caribou habitat
Tenas Creek	615	EF/SF	Balsam Pine	7 5/6				
Glacis Creek	3705	AT/FP	Balsam	5/8	Alpine	C/ G		
Core S. of Scallon	505	EF	Balsam	8/9		C		

Landscape Riparian Corridors

Location	Rationale
Telkwa River	− connectivity along Telkwa River Valley − high fish values − moose and mule deer winter range
Elliot Creek	− connectivity between Telkwa River and Howson Range − high fish values
Milk Creek	− connectivity between Telkwa River and Milk Creek core − high fish values
Sinclair Creek	− connectivity between Telkwa River and the Serb Creek core − forested mountain pass
Winfield Creek	− connectivity between Telkwa River and the Microwave
Cumming Creek	− connectivity between Telkwa River and the Microwave
Pine Creek	− connectivity between Telkwa River and the Microwave core and the Copper River − moose and mule deer winter range
Goathorn Creek	− connectivity between Telkwa River and Telkwa Range − moose winter range
Tenas Creek	− connectivity between Telkwa River and Telkwa Range (Glacis Creek core and Tenas Creek Core) − moose winter range
Howson Creek	− connectivity between Telkwa River and Mooseskin Johnny Lake − forested pass between the Telkwa and Howson Ranges − Caribou habitat − high fish values
Glacis Creek	− connectivity between Howson LRC and Glacis core in Telkwa Range − Caribou Habitat
Scallon Creek	− connectivity between Howson LRC and Howson Range − Caribou Habitat
Arnett Creek	− connectivity between Telkwa River and Howson Range − West LRC provides connectivity to the Howson Range − East LRC provides connectivity to the Howson Creek LRC

Appendix III. Acronyms

AAC	allowable annual cut
BEC	Biogeoclimatic Ecosystem Classification
CORE	Commission on Resources and Environment
FENs	forest ecosystem networks
LRMP	Land and Resource Management Plan
MELP	Ministry of Environment, Lands and Parks
MOF	Ministry of Forests
NDT	natural disturbance type
OGMAs	old growth management area
RMZ	resource management zone
VQO	visual quality objective

Natural disturbance types described in this report:

NDT1	Ecosystems with rare stand-initiating events
NDT2	Ecosystems with infrequent stand-initiating events
NDT3	Ecosystems with frequent stand-initiating events
NDT5	Alpine tundra and subalpine parkland

Appendix IV. Glossary of Resource Planning Terms

age class

An interval into which the age range of trees, forest, stands or forest types is divided for classification. Forest inventories commonly group trees into 20-year age increments up to age 140 years, then a single class for trees between 141 and 250 years old, and a single class for those older than 250 years.

biodiversity (biological diversity)

The diversity of plants, animals and other living organisms in all their forms and levels of organization, including genes, species, ecosystems, and the evolutionary and functional processes that link them.

biogeoclimatic ecosystem classification (BEC)

A hierarchical classification scheme having three levels of integration: regional, local and chronological; and combining climatic, vegetation and site factors.

biogeoclimatic zone

A geographic area with a broadly homogenous macroclimate. Each zone is named after one or more of the dominant climax species of the ecosystems in the zone, and a geographic or climatic modifier (e.g. Interior Douglas Fir). British Columbia has 14 biogeoclimatic zones.

blue-listed species

Sensitive or vulnerable species as identified by the Ministry of Environment, Lands and Parks. 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. The blue list also includes species that are generally suspected of being vulnerable, but for which information is too limited to allow designation in another category.

coarse woody debris

Sound and rotting logs and stumps that provide habitat for fungi, plants, animals and insects and their predators, and that provide a source of nutrients for soil development. Material generally greater than eight to ten centimetres in diameter.

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 links vary in natural landscapes based on topography and natural disturbance regime. Breakage of these links results in fragmentation.

cultural heritage resource

For the purposes of the *Forest Act,* a cultural heritage resource is an object, site, or the 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.

cutblock
Defined in the *Forest Practices Code of British Columbia Act* as a specific area of land identified on a forest development plan, or in a license to cut, road permit, or Christmas tree permit, within which timber is to be or has been harvested.

ecosystem
A functional unit consisting of all the living organisms (plants, animals and microbes) in a given area, and all the non-living physical and chemical factors of their environment linked together through nutrient cycling and energy flow. An ecosystem can be of any size -a log, pond, field, forest or the earth's biosphere - but it always functions as a whole unit. Ecosystems are commonly described according to the major type of vegetation, for example, forest ecosystem, or range ecosystems.

forest development plan (FDP)
An operational plan, guided by the principles of integrated resource management, which details the logistics of timber development, usually over a period of five years. Methods, schedules and responsibilities for accessing, harvesting, renewing and protecting forest resources are set out to enable site-specific operations to proceed.

forest ecosystem network (FEN)
A zone that serves to maintain or restore the natural connectivity within an area.

forest interior conditions
Conditions achieved at a point where edge effects no longer influence environmental conditions within a patch of forest. For interior B.C. forests, the edge effect is generally felt for a distance equivalent to 100-200 meters into the stand. The conditions changed usually involve light intensity, temperature, wind, relative humidity and snow accumulation and melt.

forest resources
Defined in the *Forest Practices Code of British Columbia Act* as resources and values associated with forests and range including, without limitation, timber, water, wildlife, fisheries, recreation, botanical forest products, forage, and biological diversity.

guidebooks
Guidebooks are sets of guidelines and recommendations on how to best achieve requirements of the *Forest Practices Code of British Columbia Act*. The guidebooks are not legally enforceable. However, specifications and procedures recommended by the guidebooks may be incorporated into plans, prescriptions and contracts, in which case those specifications and procedures may become legally enforceable.

identified wildlife
Defined in the *Forest Practices Code of British Columbia Act* Operational Planning Regulation as those species at risk that the Deputy Minister of Environment, Lands and Parks or a person authorized by that Deputy Minister, and the Chief Forester, agree will be managed through a higher level plan, wildlife habitat area or general wildlife measure.

inoperable areas
Defined in the *Forest Practices Code of British Columbia Act* as areas unavailable for harvest for terrain-related or economic reasons. Characteristics used in defining inoperability include slope, topography (e.g. the presence of gullies or exposed rock), difficulty of road access, soil stability, elevation and timber quality. Operability can change over time as a function of changing harvesting technology and economics.

land and resource management plan (LRMP)

An integrated sub-regional consensus-based process requiring public participation that produces a land and resource management plan for review and approval by government. The plan establishes direction for land use and specifies broad resource management objectives and strategies.

landscape unit
Planning areas established under the *Forest Practices Code of British Columbia Act* by the District Manager, that are up to 100 000 hectares in size and are based on topographic or geographic features such as a watershed or series of watersheds.

natural disturbance types (NDTs)
A term used to characterize areas with different natural disturbance regimes. Five natural disturbance types are recognized as occurring in B.C.:
NDT1 Ecosystems with rare stand-initiating events
NDT2 Ecosystems with infrequent stand-initiating events
NDT3 Ecosystems with frequent stand-initiating events
NDT4 Ecosystems with frequent stand-maintaining fires
NDT5 Alpine Tundra and Sub-Alpine Parkland ecosystems

Northwest Weed Committee
Members include: Ministry of Forests, Ministry of Environment, BC Ministry of Agriculture, Fisheries, and Foods, Coalition for Alternatives to Pesticides, Bulkley-Nechako Regional District, Canadian National Railway, and Bulkley Valley Cattlemen's Association.

old growth management area (OGMA)
Defined in the *Forest Practices Code of British Columbia Act* Operational Planning Regulation as an area established under a higher level plan which contains or is managed to replace structural old growth attributes.

operable forest
That portion of the production forest that, under current market conditions, can be harvested at a profit.

operational plan
The *Forest Practices Code of British Columbia Act* states that within the context of area-specific management guidelines, operational plans detail the logistics for development. Methods, schedules, and responsibilities for accessing, harvesting, renewing and protecting the resource are set out to enable site-specific operations to proceed. Operational plans include forest development plans, access management plans, range use plans, silviculture prescriptions, and stand management prescriptions.

patch
A stand of similar-aged forest that differs in age from adjacent patches by more than 20 years. When using the term patch in designing landscape patterns, it refers to the size of either natural disturbance openings which lead to even-aged forests or those openings created by cutblocks.

protected area
A designation of areas of land and water set aside to protect natural heritage, cultural heritage or recreational values (may include national park, provincial park or ecological reserve designations).

range use plan
An operational plan that describes the range and livestock management measures that will be implemented to ensure that range resources are protected and that the management objectives for other identified resource values are achieved.

rare ecosystem
Plant communities listed as red or blue with the B.C. Conservation Data Centre.

red-listed species
Threatened or endangered species as identified by the Ministry of Environment, Lands and Parks. The taxa on the red list are either extirpated, endangered or threatened or are being considered for such status. Any indigenous taxon (species or sub-species) threatened with imminent extinction or extirpation throughout all or a significant portion of its range in British Columbia is endangered. Threatened taxa are those indigenous species or sub-species that are likely to become endangered in B.C. if conditions are not altered.

regional land use plan
A plan identifying land use strategies at a regional level (e.g., a plan resulting from one of the CORE regional processes).

resource management zone (RMZ) - from regional or sub-regional plan:
A division or zone of the planning area that is distinct from other zones with respect to biophysical characteristics, resource issues or resource management direction. Resource management zones (in land and resource management planning [LRMP] these include settlement, agriculture, high intensity resource development, general resource development, low intensity resource development and protection) may be drawn on a map to describe general management intent. The zones are usually further defined using descriptive objectives and strategies to explain future land use and resource management activities.

riparian area
Areas of land adjacent to wetlands or bodies of water such as swamps, streams, rivers or lakes including both the area dominated by continuous high moisture content and the adjacent upland vegetation that exerts an influence on it.

riparian reserve zone
Defined in the *Forest Practices Code of British Columbia Act* Operational Planning Regulation as that portion , if any, of the riparian management area or lakeshore management area located adjacent to a stream, wetland or lake of a width determined in accordance with Part 10 of the regulation.

rotation
The planned number of years between the formation or regeneration of a stand and its final cutting at a specified stage of maturity.

scenic area
Defined in the *Forest Practices Code of British Columbia Act* Operational Planning Regulation as any visually sensitive area or scenic landscape identified through a visual landscape inventory or planning process carried out or approved by the District Manager.

sensitive areas
Small areas established under the *Forest Practices Code of British Columbia Act* by the District Manager to manage or conserve unique or locally significant resource values.

seral stages
The stages of ecological succession of a plant community ,e.g., from young stage to old stage. The characteristic sequence of biotic communities that successively occupy and replace each other by which some components of the physical environment become altered over time.

site series
Sites capable of producing the same late seral or climax plant communities within a biogeoclimatic subzone or variant.

species composition:
The percentage of each recognized tree species comprising the forest type based upon the gross volume or the relative number of stems per hectare or basal area.

stand structure
The distribution of trees in a stand, which can be described by species, vertical or horizontal spatial patterns, size of trees or tree parts, age, or a combination of these.

timber harvesting landbase
Crown land within an area that is currently considered feasible and economic for forest management. Areas 100% constrained to timber harvesting--for example protected areas, riparian reserves or old growth management areas--do not contribute to the timber harvesting landbase.

visual quality objective (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 (note: another category, "aesthetic", has been added for this plan).

wildlife trees
Defined in the *Forest Practices Code of British Columbia Act* Operational Planning Regulation as 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.