

PART VI: Landscape-Level Forest Management



10. LANDSCAPE-LEVEL ZONING OF THE ALEZA LAKE RESEARCH FOREST

10.1 Guiding Principles

Forest landscapes and their ecosystems have attributes and processes that are inherently dynamic and variable over time. ALRF landscape-level forest management and zoning under this Plan recognizes not only the intended human land uses in different areas, but also a degree of inherent uncertainty and risks related to the less predictable effects and trajectories of natural disturbances and climate change on forest landscapes. Humble recognition of such uncertainties is an important and precautionary note in any forest planning. Nevertheless in this ALRF Management Plan, we submit that the value of spatial forest zoning for protection and stewardship of different forest values is a useful planning tool whose potential benefits – in aggregate – outweigh its limitations.

Bearing in mind this broader perspective, the landscape-level management of the Aleza Lake Research Forest considers, and strives to balance four key management goals:

1. Maintaining and enhancing opportunities for forest research, education, and training across a range of disciplines and study areas.
2. Achieving forest conservation and ecosystem management goals for habitat and biodiversity, and old and unmanaged forests.
3. Providing sustainable timber management and harvesting on an identified landbase, for facilitating forest education and research opportunities, and for generating economic resources that sustain ALRF land management, infrastructure, and supporting professional capacity. And
4. Providing for, and promoting ecological resilience and diversity of ALRF ecosystems and landscapes (both managed and unmanaged), bearing in mind the influence of natural disturbances including biotic factors (pests and pathogens), abiotic factors (wind, fire, and drought), and climatic variability.

ALRF forest planning also considers strategies that enable these goals, both spatially across the landscape, and over time. The spatial designation of different land-use zones on the ALRF landscape is key to the forest management process. Such zoning allows diverse management goals to be achieved across the landscape as a whole, not necessarily on every hectare.

ALRF forest zoning for different land uses is spatially defined based on the inherent suitability of different areas of land and forest for particular uses or values. This suitability is based on a combination of factors including ecological characteristics, forest and stand structure, forest health and condition, management histories, soils, terrain, access, and research and education potential. Appropriate physical scale and connectivity of adjacent areas is also important for both forest conservation and habitat quality, and extractive and non-extractive forest uses.

Identification of ALRF land suitability, land-use “zones”, and their geographic boundaries considered all of the following considerations:

Considerations for all land use zones:

- a) Terrain, landforms, and soils, including obvious geographic landmarks and boundaries.
- b) The history and pattern of natural disturbances, past and current human land uses including forest harvesting, silviculture, and other management on the ALRF, and areas of cultural or aesthetic significance,
- c) Forest land capability, productivity, and the current geographic distribution of different forest types and stand structures,
- d) Physical geography and constraints to accessibility, including major ravines, unstable or steep terrain, streams and riparian zones, extensive wetlands, and swampy organic soils.

Old-growth reserves and natural areas will include and consider:

- a) Old-forest and natural-area conservation goals at the forest level, including existing ecologically-significant or representative mature natural forests, other natural areas (forested or non-forested), old or young), rare ecosystems, and landscape connectivity.
- b) The location and distribution of known sensitive areas, ecologically high-value habitats, high value areas, habitats, and/or vegetation conditions, unstable slopes, and/or rare or usual geological features.

Sustainable timber management areas will include and consider:

- a) The location of productive and accessible commercial forest lands within the ALRF that are not significantly constrained by other land use objectives and zoning.
- b) Reasonable ground-based access opportunities, especially with consideration to location of the permanent road network.
- c) The location of productive stands with existing silvicultural / financial investments. And,
- d) Factors that allow or facilitate the economically-efficient spatial arrangement of the ALRF commercial forest land base and road network.

Historical and current Management Plan zone terminology and application

Landscape-level management and zoning on the ALRF, as for all landbases, evolves over time as greater knowledge and experience of the land is gained.

Zoning terminology from the two previous ALRF Management Plans have been adapted or adjusted for Management Plan #3. Specifically:

- *“Research Natural Areas”* and *“Old-growth management areas”* (or OGMA’s) are functionally similar, and for brevity, will be referred to as OGMA’s in this plan.
- As per MP#2, *“Forest Management Units”* continue to refer to specific contiguous geographic areas or zones with a timber-management emphasis.

Management Units designated in Management Plan #2 are adjusted in this Management Plan #3, to simplify resource planning, reduce the number of management units from five to three, and thereby streamline implementation and monitoring activities. Specifically, these adjustments include:

- Merging of the Slaney Unit into the Northern Uplands Unit.
- Merging of the Bowron Slopes Unit into the East and West Bear Units. And,
- Merging the Central Plateau Unit into the Northern Uplands and East Bear Units.



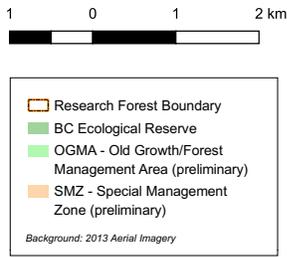
Western Hemlock growing on granitic and colluvial bedrock outcrops on the west side of the ALRF

10.2 Management of Old Forest and associated Natural Areas

10.2.1 OGMA / Natural Area Purpose Statements

Old-growth Management Areas and Natural Areas (collectively referred to in this Plan as OGMA's) are designated areas of predominantly old forest and associated distinctive natural areas which are representative of the range of forest ecosystems on the ALRF landbase, and incorporate unique and/or locally-significant or representative forest types, ecosystems, or landforms. OGMA's are intended to conserve values and biodiversity associated with old forests, they are not intended to reflect or protect all biodiversity values. While OGMA's may be located on the landscape to address multiple co-occurring values in an area, they are nevertheless focused on conserving biodiversity values associated with older forests.

Old Forest Management Areas and Special Management Zones

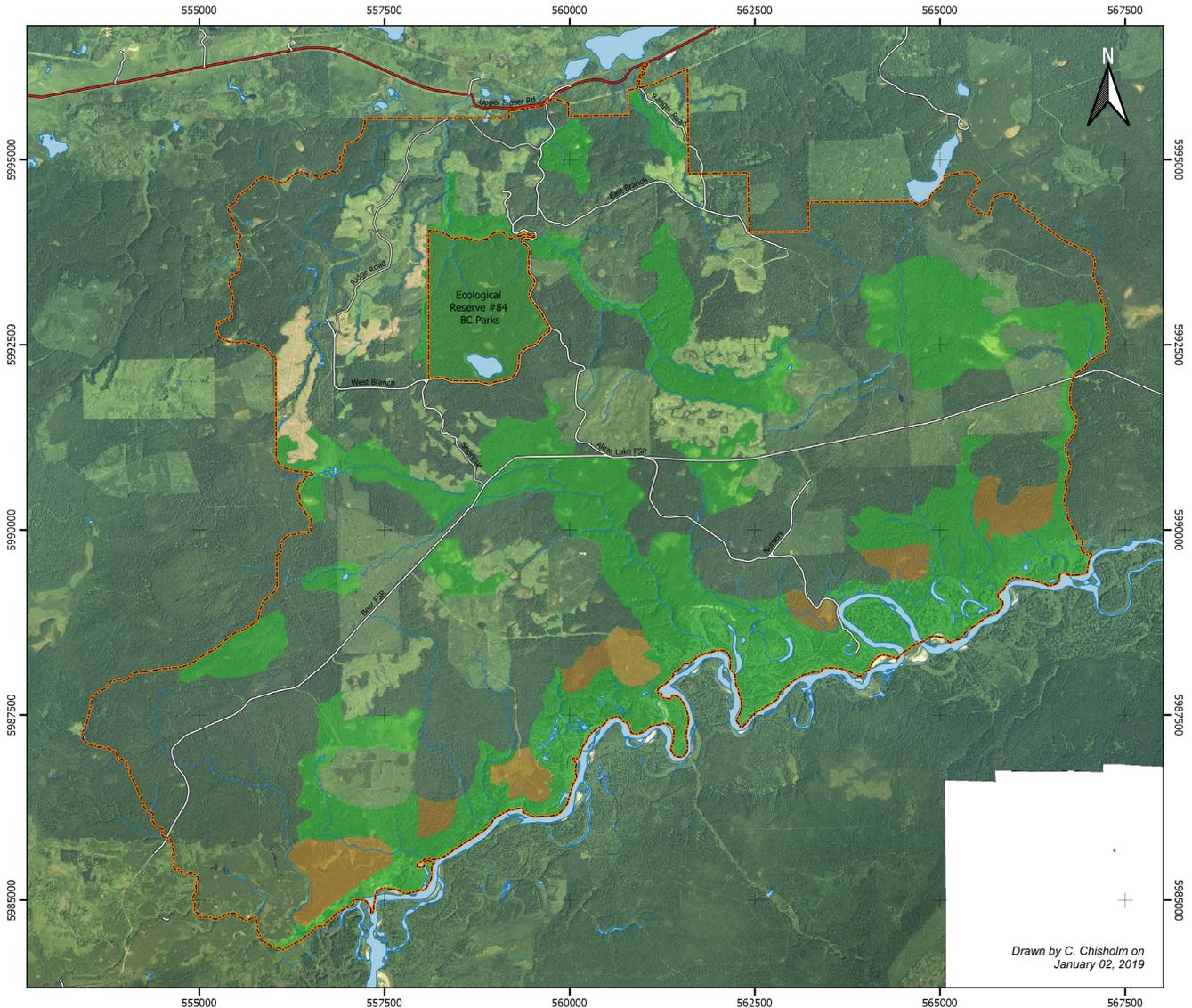


The overall management purposes and intent for OGMA retention within the ALRF are:

- a) To protect representative upland and floodplain old-forest ecosystem structures and natural processes, without significant influence from harvesting, silvicultural management, or related anthropogenic interventions,
- b) To maintain old-growth, late seral forest and natural-area habitat characteristics, including landscape-level habitat connectivity. And,
- c) To maintain the ecological integrity and connectivity of natural ecosystems by avoiding the creation of new roads within designated OGMA areas and/or minimizing and mitigating the ecological impact of existing access structures within OGMA's.

Figure 6: Map of Old-growth Management Areas and Special Management Zones within the ALRF

Map of the ALRF tenure area, indicating tenure boundaries, Ecological Reserve 84, Bowron Corridor Special Management Zones (SMZ's), and Old-growth Management Areas (OGMA's) designated under this management plan.



10.2.2 Consistency with Old Forest Objectives set by Government

“Old Forest” and natural-area management for the Aleza Lake Research Forest is guided by direction from the Province of British Columbia (BC Integrated Land Management Bureau (ILMB), 2009) regarding “*Landscape Level Biodiversity Land Use Objectives and Research Forests in the Prince George Timber Supply Area*”.

Consistent with and building upon this provincial direction, ALRF Old-Forest management under this plan (ALRF Management Plan #3) incorporates the following plan-specific definitions, goals, and strategies to guide interpretation and implementation:



“Old Forest” Definitions and Assumptions for the ALRF

1. For coniferous-leading forest types, Old Forest is defined as forest types that are equal or greater than 140 years of age, according to the provincial forest inventory.
2. For deciduous-leading forest types (including, for example, black cottonwood on alluvial sites), Old Forest is defined as forest types that are equal or greater than 100 years of age, according to the provincial forest inventory.
3. “Old-growth Management Areas” (or “OGMA’s”) are designated areas within the ALRF landscape that are set aside and reserved as Old Forest and associated Natural Areas, and are excluded from the ALRF timber harvesting landbase.
4. ALRF Old-growth Management Areas under this Plan are selected with a target of including approx. 75% or more Old Forest by area or basal area. Up to approx. 25% of OGMA areas may include younger age classes, non-forest ecosystems (such as wetlands and meadows), and forest-shrub complexes, as natural inclusions to improve habitat connectivity, allow for future high-value Old Forest recruitment, and incorporate natural ecosystem diversity and variability.
5. Endemic and periodic natural disturbances are expected to regularly occur within the old forests of OGMA areas, and are part of the ecology and dynamics of these stands. ALRF OGMA areas which experience stand-replacing natural disturbance events (e.g. such as via wind, fire, or insect attack) will be still be considered and retained as high-value areas for habitat values and future old forest recruitment and management, due to the abundance of retained woody structures and CWD, habitats, and biological legacies in such disturbed stands. These areas also provide valuable opportunities for future scientific study.

Implementation Strategies

1. The ALRF will manage Old Forest and associated Natural Areas through a combination of two interlocking strategies: (a) a primary strategy providing for specific identification of spatially-defined Old Growth Management Areas (OGMA’s) excluded from the timber harvesting landbase, and (b) a supporting “aspatial” management strategy providing for complementary Old Forest retention by retention targets within the timber harvesting landbase. And,
2. The ALRF will continue the practice of incorporating Ecological Reserve #84 in ALRF OGMA / Natural Area network planning and Old Forest percentage calculations. (Ecological Reserve #84 is under the jurisdiction of BC Parks and is completely surrounded by, but excluded from the ALRF Special Use Permit area.).

Old Forest / OGMA Goals

In preparing this Management Plan, we considered the guidance from the Province on Old Forest for the ALRF (ILMB, 2009), which states that 28% is the minimum percentage of Old Forest that should be retained on the ALRF Crown Forest Landbase (CFLB) for biodiversity objectives.

Under this Management Plan, the ALRF will manage to a target of maintaining no less than 35% Old Forest in the ALRF landscape (combined with Ecological Reserve 84). This will include both OGMA's (which are outside the Timber Harvesting Landbase or THLB) and other Old Forest areas within the THLB.

OGMA areas for the Aleza Lake Research forest under this plan are indicated in Figures 6 and 7. These OGMA areas, including ER 84, total approx. 2,570 hectares in area.

Consideration of natural disturbances in OGMA planning

Catastrophic natural disturbances (such as wildfire or large, stand-level blowdown events) may periodically impact Old Forest / OGMA areas over time. Such circumstances, when they occur, will be assessed by ALRF, and may require re-evaluation of minimum and target Old Forest percentages by the Province and the tenure-holder. Where necessary or as directed by the Province, OGMA recovery or recruitment alternative strategies under this Management Plan will be prepared by the ALRF and submitted to MFLNRORD for consideration.

Endemic natural disturbances that create smaller-scale gaps or individual tree death within the broader mature forest matrix (such as bark beetles or localized wind, snow, or ice damage) are considered to be part of the normal natural disturbance regime of old SBSwk1 forests in this region, and are not considered catastrophic disturbances under this Plan.

Harvest Planning adjacent to OGMA's

The maintenance of interior old-growth forest core habitat is important objective for OGMA's and old-forest biodiversity. Forest harvesting directly adjacent to OGMA's can open up site conditions so that environmental conditions along harvest edges (such as light, wind, and predation) may be affected. Risks include potential edge impacts or blowdown. Therefore, when

ALRF harvest practices are proposed adjacent to or near OGMA areas, one or several of the following best practices are recommended, where feasible, for consideration to mitigate edge effects on OGMA's:

- Location of buffers (e.g. Wildlife Tree Retention Areas) between harvest areas and OGMA boundaries.
- Ensuring location of windfirm harvest boundaries to avoid blowdown into or near the OGMA reserve.
- Partial-cutting or "edge feathering" of trees in the harvest unit closest to the OGMA reserve. And,
- Preserving understory vegetation and retention of green trees in the stand that provide additional habitat / hiding cover and shelter adjacent to the OGMA reserve.

"No Net Loss" OGMA Strategy

In the course of ALRF forest planning and implementation, preliminary OGMA boundaries identified in earlier stages of strategic planning may occasionally be modified to a minor extent as greater knowledge of the ALRF landbase and ecosystems are gained. In these cases, the "No Net Loss" strategy will be applied.

The no-net-loss OGMA strategy means that minor adjustments to defined OGMA boundaries are allowed under this Management Plan for adjacent forest harvesting or road building activities only where all of the following conditions are met, i.e.:

- i. Existing OGMA areas proposed for removal (i.e. for harvesting and roads) can only be replaced by bringing into OGMA's ecologically-similar Old Forest areas contiguous to existing OGMA's, in a similar geographic area,
- ii. Proposed OGMA adjustments (if any) must maintain or enhance OGMA connectivity and total area (hectares), and reduce, not increase, habitat fragmentation.
- iii. Avoid creating small isolated patches of OGMA's as replacement areas.
- iv. New roads or access structures cannot bisect existing or proposed OGMA areas.
- v. The resultant adjusted OGMA boundaries must be similar in intent and configuration to those approved under this Plan. And,
- vi. The revised OGMA boundaries are updated and recorded in the provincial forest inventory and databases.

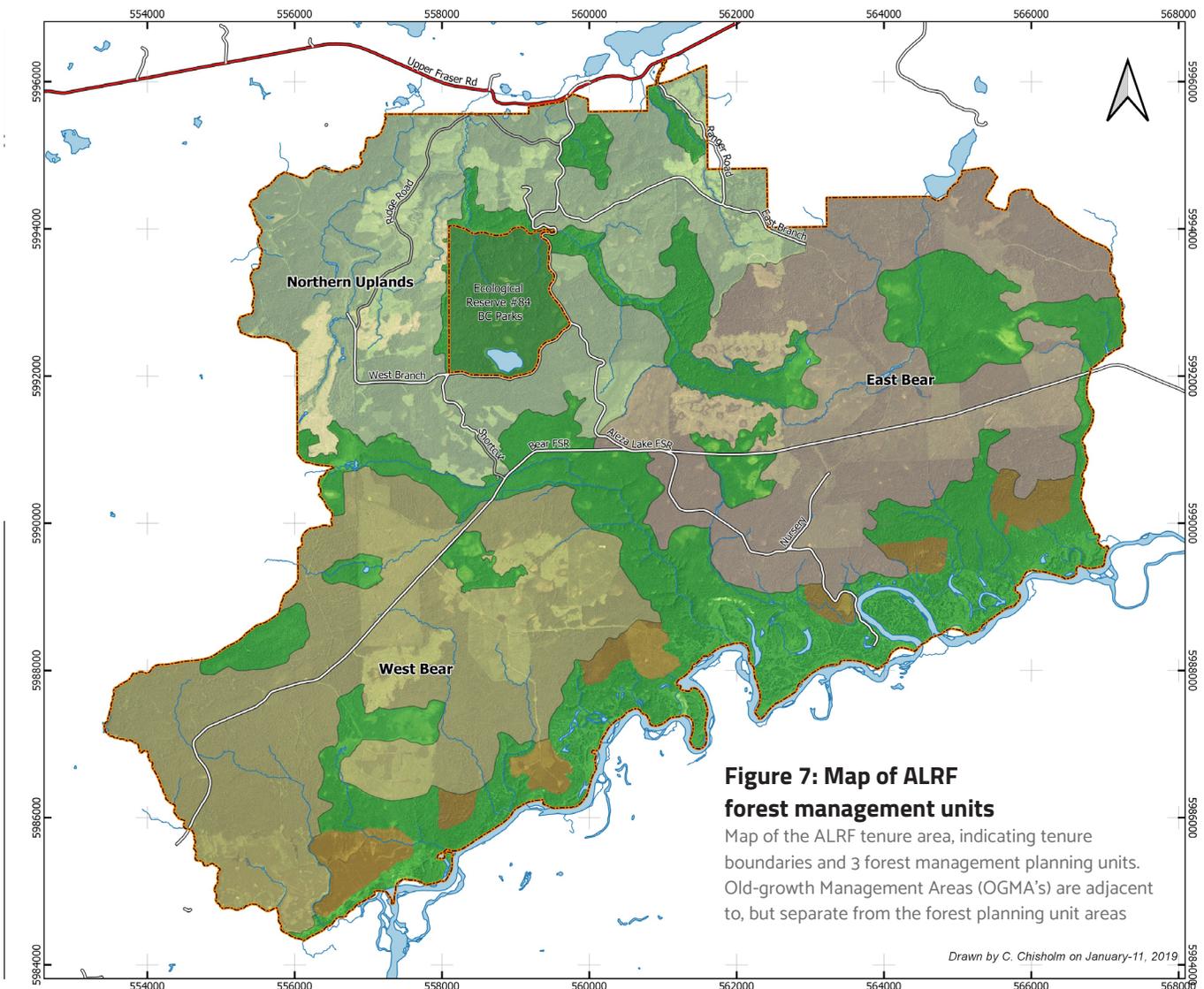
10.2.3 Additional old-forest areas not included in OGMA's

Other areas of forest which meet Old Forest definitions under this Plan, but which are outside OGMA's (i.e. - they meet definitions of Old Forest but are within the timber harvesting landbase), may also contribute to the minimum and target Old Forest percentage areas under this plan.

10.3 Forest management units and general management intent

The concept of the forest management unit used in this plan is similar to planning cells (as used in the Prince George District) or working circles or forest compartments (as used in other jurisdictions). Each of the 3 ALRF forest management units in this Plan is a geographically well-defined operational area with clear physical boundaries, existing road access or capability for establishment or re-establishment of functional road access, and similar management objectives.

Planning Compartments



Drawn by C. Chisholm on January-11, 2019

The three management units described in this Plan are generally similar in size, ranging from 2,000 to 2,200 hectares in area (Table 6). Each is a logical geographic unit of operational and strategic planning.

Table 6: Summary of ALRF Forest Management Compartments (gross THLB excluding OGMA's)

Forest Management Unit	Gross Area (hectares; not including OGMA areas)
Northern Uplands	2,084
East Bear	2,130
West Bear	2,218

The general resource management emphasis across all three ALRF management units (exclusive of any adjacent or embedded OGMA's or Special Management Zones) is timber growth and production and integrated resource management at intensive and extensive scales. Related broad stand management strategies include:

- a) Enhancement of stand productivity, value, health, and resilience.
- b) A range of rotation ages for managed stands, dependent on tree species, site productivity, site-specific stand management goals, and timber product objectives.
- c) Silvicultural systems appropriate to the stand and site, and where applicable, research and demonstration objectives.
- d) Biodiversity and ecosystem management approaches and targets consistent with the general management intent and timber management focus of these compartments. And,

Management emphases and measures for special management of specified Bowron River corridor areas will integrate non-timber and timber considerations, as further described in this Plan.

10.3.1 East Bear and West Bear Units

The East Bear and West Bear Units include a similar range of terrain, soils, and landscape types, but are geographically separated by a very large ravine system (included in the the Central Ravine OGMA), which bisects the south-central ALRF in a north to south direction.

The East and West Bear Units are areas of gently- to moderately-rolling lowland and plateau forests, with some moderately steep slopes and escarpments (steep-slope breaks) leading down to the Bowron River floodplain. The Bear Road bisects the two compartments in a southwesterly to northeasterly direction.

A landscape feature of special consideration in the East and West Bear Units is the Bowron River corridor which contains high fish and wildlife values and potential presence of cultural heritage

significance. While a substantial area of the Bowron corridor within the ALRF is already protected as OGMA reserves under this plan, additional adjacent areas of managed forest within the river corridor are designated for special management concern. This Plan spatially identifies approx. 340 hectares of Special Management Zones (SMZ's) along the Bowron River slopes and escarpment, in order to manage access and forest cover to protect and enhance wildlife, heritage, and other river-corridor values, including forested views from river-level viewpoints.

These SMZ areas will continue to contribute to the ALRF Timber Harvesting Land Base and will be available for timber management under modified practices. Within the first 2 years of this Plan, the ALRF will develop and document appropriate strategies and measures for management of these Bowron SMZ's, including access management strategies, consistent with the above management intent.

10.3.2 Northern Uplands Unit

The Northern Uplands Unit has the longest history of active forest management and research of all the ALRF management units, and includes the oldest and longest-established research trials and permanent sample plots in the ALRF and the region. This 2,084 hectare area also surrounds, but does not include the 269 hectare Ecological Reserve #84 managed by BC Parks.

Forest harvesting on the Northern Uplands Unit dates back to 1919. A wide variety of partial-cut timber harvesting methods and silvicultural systems have been used in this area, including single-tree selection, uniform and group shelterwoods, clearcuts, patch cuts, alternate strip-cuts, and diameter-limit methods. The Northern Uplands area is well accessed by roads, including the Aleza Forest Road, East and West Branch Roads, Ranger Road, and the newer Ridge Road.

The Aleza Field Education Centre is centrally located in the Northern Uplands compartment and is accessed from Km 2 on the Aleza FSR. Several interpretive trails traverse this area,



View east down the Bowron River during spring run-off, southern ALRF, May 2007

including the North Ridge, South Knolls, and East Loop trail. All three trails are used extensively for field education as well as community recreation.

The Northern Uplands are characterized by rolling hills and terraces that are dissected in several areas by steep-sided draws, undulating terrain, and rounded hills. Several creeks including Hansard (Camp), Firebreak, and Slaney Creek and their tributaries flow in a northerly to northwesterly direction through the area. The Hansard Creek watershed occupies most of this management unit.

10.4 ALRF Strategic Road Access Plan and Objectives

10.4.1 Introduction, Context, and Rationale

As a 90 km² tenure area with a forest management history dating back nearly a century to the early 1920's, the Aleza Lake Research Forest has a complex legacy of many past and current road and access routes and accompanying administrative designations, including status and non-status roads.

Some roads and routes date back to provincial works between 1924 and 1964 through the old Aleza Lake Forest Experiment Station area and Aleza Lake Ranger Station eras. Other road networks within the ALRF tenure established between 1945 and 2000 were constructed by past forest industry licensees under road and cutting permits both within and adjacent to the current ALRF area. Finally, in the era from 2001 to the present, a number of tributary forest road sections within the ALRF were constructed for timber management and extraction by the Aleza Lake Research Forest Society, the current tenure holder.

Designated sections of Forest Service Roads (FSR's) within the ALRF have been managed, maintained, and upgraded by the ALRF under Road Use Permit with the Province, since 2001. The administrative classification of certain FSR sections within the ALRF may be changed by the Province in future at their discretion, subject to application by the ALRF Society as road tenure holder. New sections of road have been built by the ALRF Society under authority of Road Permits or Special Use Permit 23165.

As noted previously in this plan, in 2015, the Province (MFLNRORD Prince George District) approved boundary changes to the

ALRF tenure area which adjusted and consolidated ALRF tenure boundaries to better reflect major landscape and topographic features and barriers, replacing old boundaries which tended to follow old administrative and survey boundaries primarily on cardinal directions. The new ALRF boundary maintained the general size (in hectares) of the ALRF while providing much more logical and coherent geographic boundaries for future ALRF landscape-level and ecosystem-based forest land management.

This management plan provides a vital and long-overdue opportunity for consideration and definition of long-term strategic road access management planning and objectives for the ALRF landbase, and for long-term coordination and rationalization of the ALRF road network for its various uses.

In preparation of this section, the ALRF Society has also referenced and considered the recent information and recommendations of the BC Forest Practices Board Report (FPB SR 49, 2015) on access management and resource roads in British Columbia.



East Branch Road, ALRF, Fall 2010

10.4.2 ALRF Road Access Management Objectives

1. The long-term vision or goal for the ALRF road network is for a coordinated and re-aligned ALRF road network that provides:
 - a) Safe and effective primary access to all Forest Management Units in the ALRF, for research and education, timber management, fire access, and ancillary public use of Crown land.
 - b) A singular access-management entrance / exit of the ALRF road network north from the ALRF tenure area to the provincial highway system at the junction of the Aleza Lake FSR (FSR 4311.01) and the Upper Fraser Road. And,
 - c) Limitations to, or phase-out of secondary vehicular access from outside the ALRF through west and east boundaries on the Beaver-Bear Road via specified access control points. (The ALRF will continue to manage applicable road tenures within the ALRF Special Use Permit area).
2. This ALRF management plan:
 - a) Identifies the core network of primary (permanent) forest roads required for short- and long-term ALRF tenure function and access, and long-term approach to road network management and use.
 - b) Clearly distinguishes between permanent access roads, wilderness roads, temporary roads, and fire access routes.
 - c) Identifies priority (or preferred) road sections and/or points for road deactivation, based on strategic access management objectives.
3. Under this management plan, the ALRF Society as tenure holder commits to the following road and access management processes:
 - a) First Nations and stakeholder consultation on strategic access management issues including major changes to permanent road access, and,
 - b) ALRF road inventory and reconnaissance-level field assessment and documentation of condition and status for historical and currently-inactive status and non-status road sections within the ALRF tenure area.

10.4.3 Road Use Classes

A. ALRF Primary Road Network

The ALRF primary road network includes designated permanent road sections designated for long-term industrial and non-industrial use, with a permanent road prism, permanent drainage structures and/or bridges. Figure 8 indicates the location of this permanent road network, as well as the general intended locations of access control structures. Most of these road sections currently have all-weather running surfaces. The long-term goal (subject to future funding and resources) is to upgrade all primary road sections to this standard.

The ALRF primary road network, with recommended access control points, will be spatially defined under this plan.

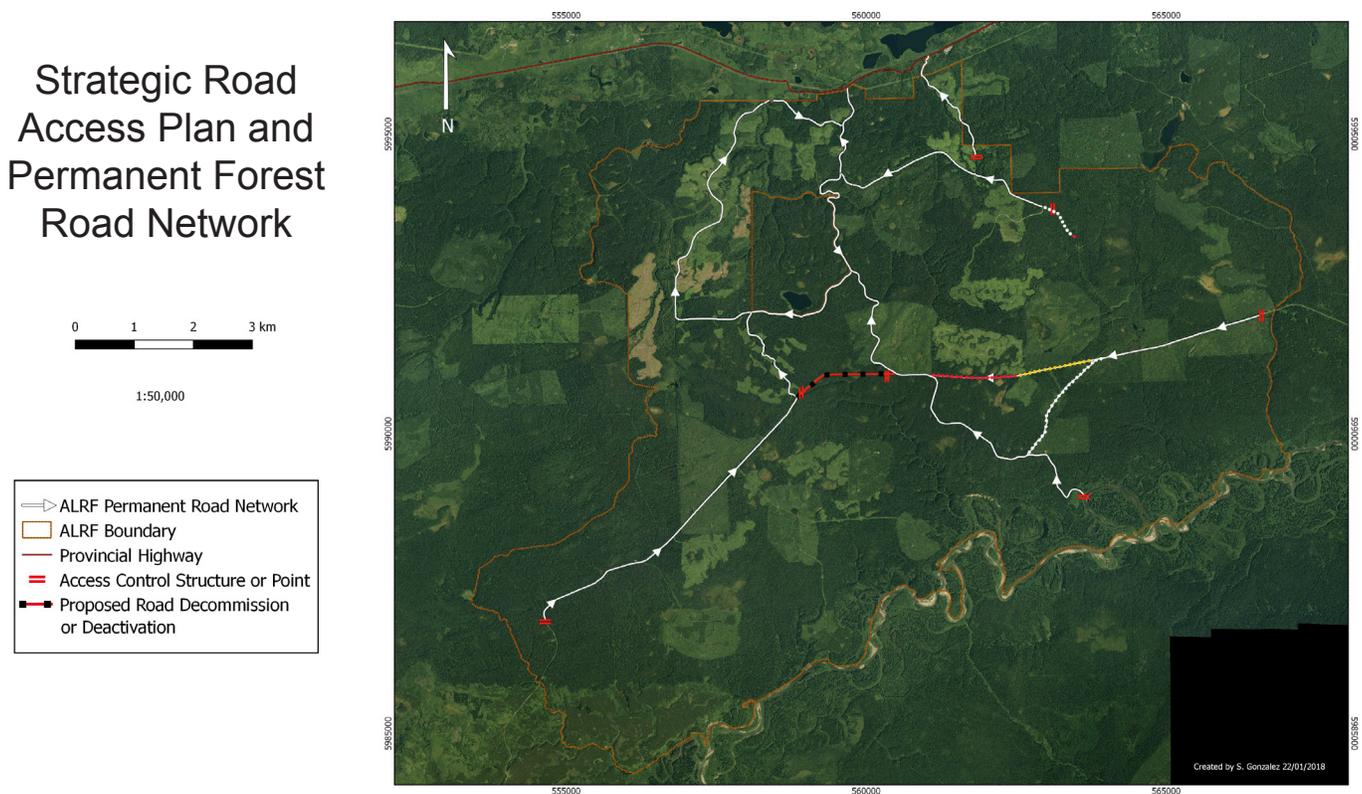


Figure 8: Strategic Road Access Plan and Permanent Forest Road Network

ALRF strategic road access plan and primary permanent road network

B. Wilderness Roads

Minor permanent tributary roads within the ALRF primary road network will be managed as “wilderness roads” with regular inspections of the road prism and drainage structures by the ALRF. Typically, these roads are secondary spur roads < 2 km in length which are an existing road infrastructure asset, and do not require deactivation.

The ALRF may at their discretion manage or limit vehicular access to individual ALRF wilderness roads, via access control structures, based on safety or other considerations.

Wilderness roads within the ALRF will be assessed, designated, and managed on a case-by-case basis, and notice signs posted on applicable wilderness road sections.

C. Temporary Forest Roads

Typically, temporary forest roads are those one-season-use to two-year-use roads required for timber access and reforestation, and deactivated and rehabilitated after use with sediment-control and revegetation measures implemented, and natural drainage patterns restored. Location of, and management of temporary forest roads will be defined in ALRF operational plans.

D. Fire Access Routes

Under this management plan, ALRF Fire Access Routes (FAR's) are a spatial GIS inventory of historical road access routes and functional road prisms on the ALRF Crown Forest landbase. These routes are capable of reasonably rapid reactivation with appropriate equipment – either as access routes or fire-guards or both – by Provincial wildfire authorities in the event of a wildfire within or near the ALRF tenure area. The ALRF will maintain this spatial FAR inventory (in the form of shape files and access descriptions) for the purposes of ALRF Fire Preparedness Planning.

For greater clarity, FAR's do not include:

- i. Active or wilderness roads managed under ALRF road tenures.
- ii. Temporary access roads for ALRF timber harvesting or forest operations, unless reactivated as such under ALRF-approved Site Plans. Or
- iii. Road sections that have been permanently deactivated for environmental reasons.

Further to the above, FAR's are not maintained or managed by the ALRF Society in any way, other than periodic field observation of site conditions, and maintenance of a spatial GIS inventory. A preliminary map of the FAR network is provided in Appendix A3 of this plan.

10.5 Wildfire Preparedness Planning

Even though the ALRF is located in an area considered a moist cool, ecological zone, sustained periods of high to extreme fire hazard can potentially occur in any given year in this area, especially in summer months. Large fires (such as the 1992 Eagle Fire on the southwest perimeter of the ALRF) may be relatively rare, but extensive stand-destroying events. Such conditions may be exacerbated in future with changes in regional climates and increased extreme events. Even within the ALRF under any climatic conditions, variations in site conditions and fuel types will influence local fire hazard conditions.

Therefore, by 2020, the ALRF will prepare and/or maintain a Wildfire Preparedness Plan (WPP) by no later than April 30th of each year.



The ALRF WPP will include the following information:

1. A map and spatial inventory of ALRF active roads (including evacuation routes) and fire access routes.
2. ALRF buildings and infrastructure (e.g. Aleza Field Education Centre) and related forest-fuel treatment areas.
3. Wildland-Urban Interface (WUI) considerations for local communities, where applicable.
4. GPS Location of major forest research trials.
5. Map and spatial inventory of suitable water sources (for aerial, ground pump crew, or truck access) for fire-fighting and related purposes.
6. Mapped landscape-level natural firebreaks based on terrain features, forested and open wetland complexes, humid forest types, lakes, points, and waterbodies.
7. Other information, as applicable or as required by the Province.

The ALRF will update the WPP annually or periodically (maximum of every 3 years) during the term of this management plan, or more frequently as substantial new information becomes available.

The WPP will be provided on the ALRF website and to Provincial wildfire authorities on an as-needed basis.