

**THE BARKLEY COMMUNITY
FOREST**

**Sustainable forests providing sustainable
jobs for our communities**



Barkley Community Forest Agreement Management Plan

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**APPENDIX B. BARKLEY COMMUNITY FOREST TIMBER SUPPLY ANALYSIS
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1:20000 SCALE MAP ATTACHMENTS:

- 1) Barkley Community Forest Forest Cover and Streams Map
- 2) Barkley Community Forest Orthophoto Map
- 3) Barkley Community Forest Recreation Resources Map
- 4) Barkley Community Forest Visual Quality Objectives Map

1. Guiding Principles

1. Forest resources are managed in a manner that assures environmental sustainability.
2. Local processing of timber resources is promoted at fair market value for the logs.
3. The multitude of timber and non-timber resources are managed in a collaborative, and integrated manner.
4. All stakeholders are assets to the community forest and are treated with respect, and operations are done in an open and transparent manner.
5. The west coast communities have the opportunity to be involved in forest development planning and participate in the monitoring of activities.
6. Plans that create employment opportunities in timber harvesting, silviculture, processing, forestry and engineering, and management are promoted.
7. Forest management applies a balanced use of forest resources.
8. Harvesting activities on the Stopper Islands will be restricted to selection for cultural use purposes. All other activities shall be consistent with the objective of protecting the cultural heritage resources of the island.

CFA Overview

The MoFLNRO has defined an operating area for the BCFA area totaling 6751 hectares, primarily in the Maggie Lake watershed, and with additional area along Barkley Sound towards Ucluelet. The areas are illustrated on the Barkley Sound Community Forest Map (Figure 2). The BCFA is located in the Alberni-Clayoquot Regional District (ACRD) northeast of the District of Ucluelet. The BCFA lands have been used by the First Nations for generations. More recently, the area has been utilized as forestry lands and has been harvested under the industrial forest model from the 1940s to the present. In addition to forestry, an iron ore mine operated in the heart of the area from 1961 to 1969.

The CFA will be managed for a blend of timber production, wildlife habitat conservation, water quality and fish habitat protection and recreation. Areas of potential conflict include impacts to visual landscapes from harvesting, and deactivation for bridges used by recreationists. The area is used by 4x4 recreationists, mountain bikers and also by hunters.

The proposed CFA has been heavily logged over the past decades, but there are still areas of merchantable and operable old growth that could be harvested in the short term.

Management of the CFA will have to consider impacts to non-timber resources and other users due to the close proximity of the area to communities such as Macoah, Hitatsoo and Ucluelet. Tourism is a significant and growing part of the local economy and tourism impacts will need to be addressed and minimized.



Figure 1: Councillor Daniel Touchie from the Ucluelet First Nation signs the guest book at the open house

The BCFA lands are located within the Maa Nulth Final Agreement Domestic Fishing Area, Wildlife Harvest Area, and Migratory Bird Area, with a small portion located within Tla-o-qui-aht FN shared territory.

The Treaty Nations of the Maa Nulth agreement share many features of culture and language with other first nations of the west coast of Vancouver Island and are referred collectively as the Nuu-chah-nulth. The Toquaht Nation, are members of the Nuu-chah-nulth Tribal Council and signatory to the Maa-nulth Treaty.

The Toquaht Nation traces their origins back thousands of years to ancestors who occupied their territory along the east side of Barkley sound.

Local First Nations have long been a part of this landscape, relying on the forests for shelter, clothing, and food. Formerly a prominent tribe with extensive territories, the Toquaht were severely reduced by disease and prolonged warfare. One hundred and thirty-five people are registered members of the band, 19 of whom live on reserve in the traditional village of Macoah. From the early to mid-1980's the Toquaht nation had been guided by their traditional Chief, the late Bert Mack, along with Councillors Kevin and Lillian Mack. The Chief of Toquaht nation is currently Chief Anne Mack. The BCF is another step towards achieving their objective of reinforcing their historical link to the land.

In 2006 the Toquaht Nation was officially asked to apply for a CFA to manage the southern area of the currently proposed community forest. Although in recent years the Toquaht have held short term non-replaceable tenures and a Woodlot Licence which is a small area based tenure, a community forest licence is seen as an opportunity to officially become the land stewards of an important and significant part of their asserted traditional territory.

One of the Toquaht Nation's goals is to set a high benchmark for forest stewardship and assure the sustainability of the area for use by future generations. The Toquaht Chief is hopeful that the BCFA can provide some employment for young people which will enhance opportunities in the area and bring them back to their traditional homes.

Current economic activities of the Toquaht Nation are a good fit with the community forest as these enterprises can help each other to succeed. These include

- 🌲 Barkley Sound Shellfish,
- 🌲 A Marina at Toquaht Bay- Docking Facility and Campground,
- 🌲 A Toquaht Community Timber Mill near Macoah ,
- 🌲 Toquaht Development (Forestry),
- 🌲 Toquaht Enterprises (Forestry),

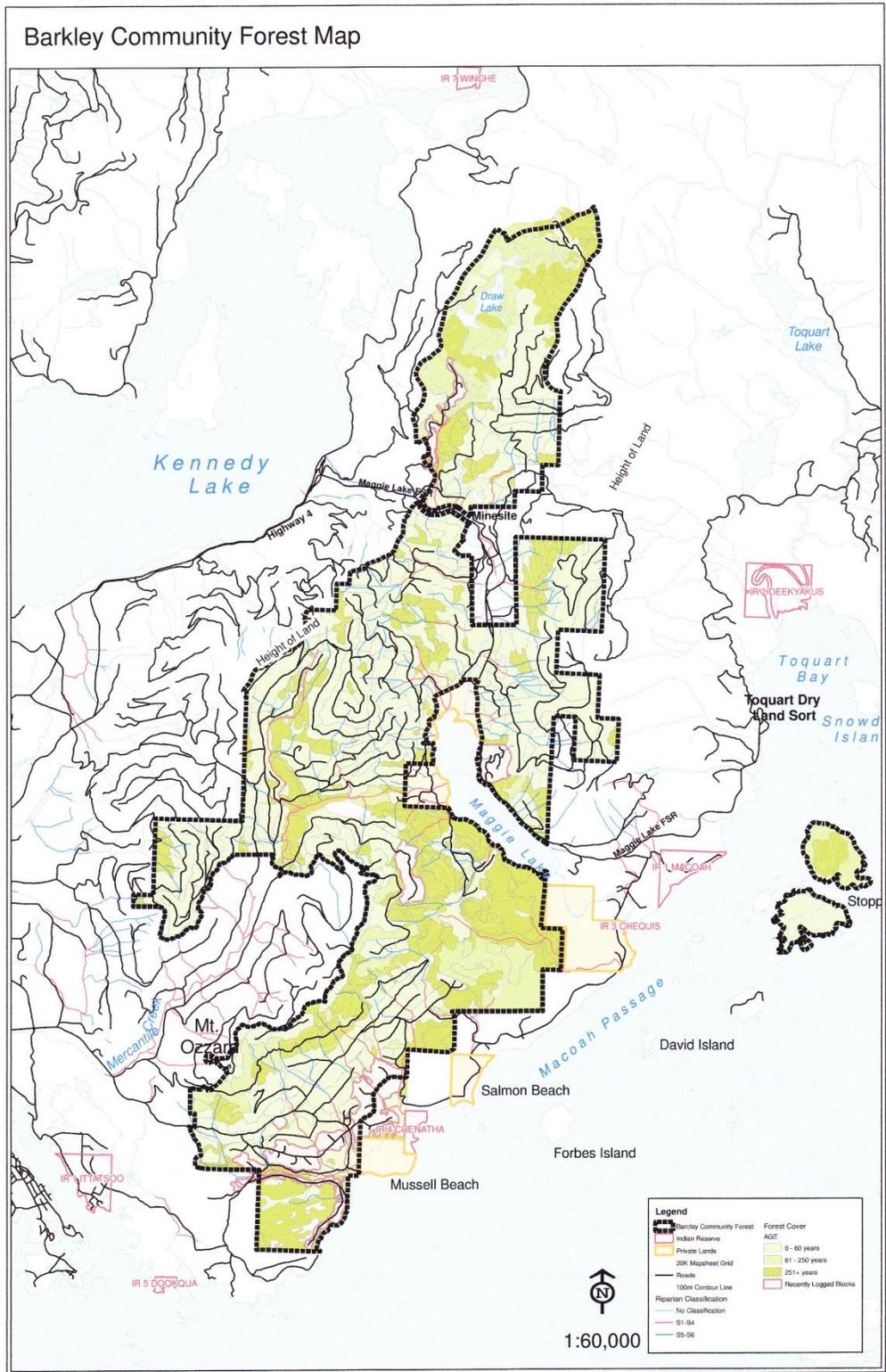


Figure 2. Barkley Community Forest Regional Map

2. Social, Economic and Broad Resource Management Goals

1. Establish and maintain a healthy and productive working forest that provides economic, social, cultural, and environmental benefits to both current and future generations living on the west coast.
2. To fully realize the optimal potential of the forest land to host a diversity of viable economic activities with an emphasis on local employment while, maximizing local value-added opportunities which contribute to the long-term strength and diversity of the Ucluelet and area economy.
3. To create and administer the community forest in a business-like manner and to ensure financial self-sufficiency, and generate a fair rate of return on investment.
4. To encourage and advance a sustainable and profitable non-timber harvest sector.
5. To undertake progressive forest management practices that protect ecosystems, promote forest regeneration, and which ensure a sustainable base that allows long-term benefits to be realized.
6. Restore degraded capacity of forest lands to contribute economic benefits.
7. To uphold the Clayoquot Sound Biosphere Reserve Charter vision and principles within the Clayoquot Sound Biosphere Reserve Region.
8. To provide the local community with long term access to a land base and associated forest resources.
9. To promote partnerships between aboriginal and non-aboriginal people where all people and their values and priorities are respected.
10. Management is conducted in an open and honest manner with respectful consideration of varying community perspectives.
11. Operations are conducted in a safe manner and workers are treated with respect.
12. The Stopper Islands are distinct areas to be managed with the objective of preserving for cultural heritage values..

3. Annual Reporting to the Communities

On an annual basis the managing partner, Barkley Community Forest Corporation will hold an open house in the local area whereupon it will provide a written report on achievements in addressing:

- *Provincial Community Forest Agreement Program Objectives*
- *Barkley Community Forest Guiding Principles*
- *Barkley Community Forest Social Economic and Broad Resource Management Goals*

This written report will subsequently be posted on the BCF website.

4. Legislation and Higher Level Plans – Guidance Documents for Management Plan

The BCF Management Plan is consistent with the current forestry legislation, the community forest agreement application and licence package, and higher level plans. Plans and legislative requirements affecting planning in the community forest are summarized in Appendix A.

Although some objectives and strategies overlap with Forest and Range Practices Act (FRPA) objectives that will be outlined in a future Forest Stewardship Plan, all objectives are included in the Management Plan in order to be transparent with the public regarding the direction of the BCF. The objectives are not in conflict with FRPA objectives or requirements; but are more specific about how FRPA objectives may be achieved on the BCF land base.

5. Resource Inventories

Introduction

Resource inventories are used in various phases of harvest planning, particularly in the TSA of the Management Plan.

Resource inventories for most of the community forest area were originally produced by previous tenure holders or Forest Investment Account/Forest Renewal BC projects and are generally on a 1:20,000 landscape level scale. The inventories are described here and are summarized in the attached 1:20000 scale maps. Inventories include or were derived from:

- 🌲 2007 Orthophotos
- 🌲 Forest Cover Maps
- 🌲 Engineering and roads documentation
- 🌲 Previous TFL 44 Management Plan and associated inventories
- 🌲 Previous TFL 44 and UEDC Forest Development Plans for the Barkley Area
- 🌲 Streams and roads
- 🌲 1:5:000 contour map base
- 🌲 Road Access Management Plan
- 🌲 Draft Landscape Units and associated plans
- 🌲 Draft Old Growth Management Areas
- 🌲 First Nations cultural and archaeological information
- 🌲 Mineral Claims
- 🌲 Wildlife information and Wildlife Habitat Areas
- 🌲 Visual Landscape Inventory

With this amount of available information there is no need at this time for the CFA tenure to conduct any further inventories at the landscape level. At the site level, the BCF will collect information during the cutblock layout stage for the preparation of the site plans. For the

long-term, the most urgently needed new inventory is an updated forest cover. BCF will complete an inventory and propose a new AAC within 10 years of the CFA being signed. . If finances allow, the following information would be useful inventory projects that would improve the community forest's ability to plan for the future.

- 🌲 Harvest System and Access Classification Mapping (Operability replacement);
- 🌲 Terrain Stability Mapping (class 1- 5);
- 🌲 Site Index Adjustment Project (using TEM as a sampling base). This is important for the large areas of Douglas Fir second growth to determine the actual growth and risks relating to off-site Douglas Fir mortality, or poor growth, which could seriously impact future AAC, levels;
- 🌲 TRIM II Mapping Upgrade;
- 🌲 Recreation Features Inventory;
- 🌲 Wildlife Inventories (eagle nest, bear and cougar den areas); and
- 🌲 An enhanced silviculture plan may also be beneficial to determine the benefits to the AAC and stand economics of intensive silviculture practices (e.g. fertilization, pruning, stand conversion of off-site Douglas Fir, etc.).

As a minimum, the agreement holder commits to:

1. updating the current Visual Resource Inventory on an ongoing basis to include roads and any development activities conducted on the proponent;
2. updating various inventories as information comes available from site assessments (stream classification, terrain stability, etc); and
3. working to promote and secure funding to complete ecosystem mapping for the community forest. Ideally, this mapping would be 1:5,000 scale Terrestrial Ecosystem Mapping.

Forest (Timber) Inventory

The TFL 44 forest inventory was maintained and updated (to reflect changes due to harvesting, silvicultural activities, property additions or deletions and changes in property tenures) by Weyerhaeuser and given to the community forest for purposes of determining the AAC.

The basic building block of the inventory is the “stand.” Each stand is identified by the following variables:

- A measure of site productivity: expressed by 3-metre site index classes.
- Age of immature by year established.
- Up to three species: in descending order of basal area.
- A measure of stocking:
 - Volume class in mature and in older second growth cruised during the last 20 years;
 - Basal area in cruised second-growth stands; and
 - Number of stems per hectare and distribution in younger stands.

BCF will complete a re-inventory of the forests in the Barkley Community Forest and propose a new AAC within ten years of the CFA being signed.

Terrain

Terrain stability mapping for the plan area uses the five class system for mapping terrain stability. Classes I, II, and III are considered stable, class IV is considered potentially unstable and class V is unstable. TFL 44 previously surveyed class IV and V terrain and this data is available for the Maggie Lake Watershed area.

Operability

The mature productive forest was assessed for physical operability and for broad classes of logging methods. The assessment was done in 1993. Three classes have been mapped, specifically:

- **Physically Inoperable Timber:** Timber on productive land that is steep and/or rocky and it cannot be safely felled or yarded, or a significant proportion of the volume could not be recovered.
- **Conventional Harvest Systems:** Includes timber on productive, physically operable land that is harvestable by conventional methods, i.e., grapple, high-lead, hoe-chuck, skidder.
- **Non-conventional Harvest Systems:** Includes timber on productive, physically operable land that is harvestable only by non-conventional methods. These include helicopter, balloon or long-line cable systems.

Both conventional and non-conventional harvest systems are included in the THLB, while physically inoperable timber was excluded.

Recreation and Trails

A recreation inventory including recreation areas and features was maintained by Weyerhaeuser for TFL 44. This dataset had no inventoried recreation features within the area of the community forest. The BCF wishes to update this inventory and include GPS trail locations and recreational use area, as more accurate data can easily be collected for the smaller community forest land base.

Visual Landscape

The visual landscape inventory was updated in 2000 to 1997 MFLNRO standards. Scenic areas and corridors in and adjacent to the BCF have been established under a Sec 7(1) Government Actions Regulation (FRPA) Order. In addition to landscape polygons with recommended visual quality classes, the inventory includes the Macoah passage visual corridor (visuals from ocean going vessels) and scenic corridors along well used forestry roads.

Wildlife

Inventories of Wildlife Habitat Areas (WHA) including Ungulate Winter Ranges and Marbled Murrelet Habitat Areas (MAMU) are maintained by the MoFR and spatial data can be downloaded from their websites. There is one Marbled Murrelet (MAMU) area and no UWR areas in the BCF. The WHA 1-210 reserved for MAMU habitat was established by government order on January 21, 2008.

Riparian

TFL 44 maintained an inventory of stream classifications (S1 to S6) and occurrence of fish at a scale of 1:20 000 which was passed on to the BCF. This database has continuously

been updated with 1:5000 level data, and the BCF will maintain this level of spatial data collection.

Old Growth Management Areas (OGMAs)

Draft spatial inventories of OGMAs were originally developed for the Maggie and Toquart LU Plans. These have not become legal requirements, but were considered no-harvest areas at the time the Timber Supply Analysis was prepared in 2007.

6. Forest Management Objectives

The VISLUP as well as Government objectives established under the FRPA and the Government Action Regulation (GAR) identify the broad social objectives for the PCF area. The BCF commits to meeting all higher level plan objectives and approved plans. In addition, the BCF has objectives based on community values.

6.1 Timber Resources Objectives

6.1.1 Background Information

Along with the benefit of local management of the forest resource, the main benefit of the community forest for the community is the return of jobs to the region, either in harvesting the timber, or through local investments through purchases made in the community for work in the community forest. Secondary benefits are that profits, if any, from harvesting will be returned to the community and community forest.

Harvesting plans will be designed to obtain a balance between timber and non-timber values and priorities that are important to the community while maintaining a profitable business.

Providing a continuous flow of wood from the community forest will require some silvicultural intervention in order to increase the volume of wood in the greater than 60 year age class and to reduce the future reliance of off-site Douglas Fir second growth. During the term of the CFA, BCF will take steps to move towards a more even age class distribution for the forest and to use silviculture intervention to ensure more appropriate west coast species are available to future generations.

The community forest aims to minimize wood waste and logs left on the ground. Wood waste adds up, and opportunities in British Columbia communities are lost as the wood is not going to mills to be processed.

The community forest will endeavour to meet or exceed the BC Coastal Utilization Standards while being mindful of coarse woody debris requirements in the FRPA that promote wildlife and soil productivity. Log salvage and firewood cutting will be promoted where the tree quality and species mix makes this diverse utilization a sound business decision.

6.1.2 Objectives

The timber resource objective is to provide, in the long-term, a continuous flow of timber from the community forest land base in the most economically efficient manner that provides local jobs and economic benefit to the community, a viable business for the District of Ucluelet and the Toquaht First Nation, and a balance between harvesting and other forest values.

To ensure a long-term continuous flow the BCF must maintain and enhance sustainable timber supply; establish annual rate of harvest consistent with forest productivity, inventory, environmental protection, forest health, non-timber resource interests and optimal timber flow; and realize the potential of forest lands to contribute economic benefits through timber harvesting and processing.

6.1.3 Strategies to meet objectives

- 🌲 Promote and pursue new and innovative forest harvesting techniques to improve utilization, operability, efficiency and /or reduce environmental impact.
- 🌲 Manage planning, silviculture, and harvesting in a cost effective manner.
- 🌲 Maximize wood value by selling logs to the highest bidder.
- 🌲 Encourage wood buyers who are interested in primary and value-added processing in the Barkley Sound area.
- 🌲 Make logs available to small local manufacturers. Stockpiling and marketing small volumes of logs locally will allow small value added manufacturers to develop their businesses (i.e. cash flow management).
- 🌲 Investing in capital improvements (e.g. dryland sorts, industrial parks), to allow for the creation of secondary and value added manufacturing facilities by other investors.
- 🌲 Minimize wood waste in balance with coarse woody debris requirements.
- 🌲 Improve inventory of timber resources.
- 🌲 Pursue funding for incremental silvicultural treatments to improve timber quality by ensuring appropriate on-site species.
- 🌲 Use incremental silviculture such as fertilization (where appropriate) and manual brush control (minimize herbicides use) to increase growth rate of forests less than 60 years of age.
- 🌲 Invest in incremental silviculture to increase the productivity of the land, volume, and value (decrease economic rotation age) of the second growth timber thereby increasing the allowable annual cut.
- 🌲 Monitor harmful insect and disease activity and, where practicable, apply mitigation treatments to control their spread.

6.2 Access Objectives

6.2.1 Background Information

The community forest can help to promote the economy of the region by ensuring access to the area of the community forest to non-timber forest users. This access can promote businesses that use botanical forest products or water uses such as micro-hydro or a bottled water provider. Maintaining access also promotes tourism and recreation opportunities and businesses in the community forest.

6.2.2 Objectives

Develop mutually supportive road use and maintenance arrangements with other users.

6.2.3 Strategies to meet objectives

-  Upgrade the road infrastructure to ensure long-term access.
-  Plan for permanent access wherever it can promote non-timber forest use.
-  Maintain active roads to promote the comfort of users and not degrade the condition of vehicles.
-  Work with other user groups to select roads to be well-maintained, and to share maintenance costs where possible.

6.3 Watershed Objectives

6.3.1 Background Information

The BCF operating area includes the Maggie watershed where water flows into Maggie Lake and the Toquart watershed flowing into the ocean. There are no community watersheds in the BCF area.

The following objectives are for all areas of the community forest.

6.3.2 Objectives

Maintain stream processes, water quality and water quantity within range of natural variability. Incorporate the interests of water users into forestry plans. Apply management practices to land development to minimize or avoid impacts to water quality, quantity and timing of flows.

6.3.3 Strategies to meet objectives

-  Where possible, restore damaged or degraded streams.
-  Incorporate watershed restoration opportunities with development plans where possible and pursue restoration funding opportunities.
-  Plan to minimize road requirements.
-  Plan for temporary rather than permanent roads in areas where there is a high likelihood of erosion into streams.
-  Carry out frequent road inspections and minimize delays in road repairs.
-  Deactivate roads where appropriate in a timely manner.

- 🌲 Minimize soil disturbance during harvesting.
- 🌲 Install adequate culverts to ensure natural water courses are maintained.
- 🌲 Re-vegetate right-of-ways, cut slopes, road surfaces, and landings where necessary to reduce soil erosion into streams.
- 🌲 Implement only those silviculture practices that have minimal impacts on water quality.
- 🌲 Implement site specific rainfall shutdown guidelines for operations
- 🌲 Consult and cooperate with local groups promoting water quality.

6.4 Fisheries and Riparian Objectives

6.4.1 Background Information

The largest water body in the BCF is Maggie Lake. It is accessed via the Maggie Forest Service Road southeast off of Highway 4, 22 km (9 miles) northeast of Ucluelet. Dolly Varden, char, cutthroat and rainbow trout are resident in the lake.

6.4.2 Objectives

To manage timber and non-timber resources such that water quality, quantity, and timing of flow are not impacted in either the short or long-terms.

6.4.3 Strategies to meet objectives

- 🌲 Strategies outlined for watersheds will also benefit fish.
- 🌲 Consult and cooperate with local groups promoting improved fish habitat.
- 🌲 Facilitate stream restoration work to enhance the salmon returns thereby benefiting the local salmon and sport fishing industry.
- 🌲 Assimilate data and map fish habitat for incorporation into forestry plans.
- 🌲 Support fish habitat restoration initiatives.



6.5 Recreation Objectives

6.5.1 Background Information

Outdoor recreation is one of the main attractions of the west coast and a key component of the local lifestyle. Typical activities include hiking, fishing, sightseeing, wildlife-viewing, hunting, biking, berry and mushroom picking. Access is a key requirement to pursue many of these activities, so the maintenance and enhancement of roads and trails is a fundamental goal of the community forest. Access to the coastline and Maggie Lake is a priority as the majority of the public use in the area is along the Barkley Sound coastline and in Maggie Lake.

6.5.2 Objectives

Industrial activities will coexist and complement recreational opportunities within the community forest; opportunities for recreation will be maintained and enhanced; maintenance and establishment of new recreation sites is encouraged: and recreation access interests are incorporated into road maintenance plans.

6.5.3 Strategies to meet objectives

- 🌲 Keep an inventory of roads required for recreation access, and maintain these roads where practicable.
- 🌲 Where funding is available, maintain and improve road access to recreation areas and trailheads.
- 🌲 Facilitate the development of recreation infrastructure (trails, campgrounds, etc) to aid in the growth of the vibrant recreation and tourism industries.
- 🌲 Work with the local trail user groups to maintain, enhance, and hopefully improve trail systems including preparing and maintaining directional and informational signage and parking areas at trailheads.
- 🌲 Where trails run through proposed cutblocks consider trail relocation when they conflict with harvesting operations, trail maintenance or improvement, or where going through a cutblock may showcase forest practices, or provide an interesting viewscape.
- 🌲 Provide interpretive signs on trails where appropriate to explain multiple forest use concept, harvesting techniques, and silviculture practices.
- 🌲 Fine tune recreation net-downs in the AAC calculation.

6.6 Cultural Heritage Objectives

6.6.1 Background Information

The BCF is located within the Maa Nulth Final Agreement Domestic Fishing Area, Wildlife Harvest Area, and Migratory Bird Area, with a small portion located within Tla-o-qui-aht FN shared territory.

Aboriginal and non-aboriginal people cherish the community forest for peaceful enjoyment, beauty, evidence of ancestral use, and spirituality associated with tall trees and healthy plant communities.

The BCF is fortunate to have the Toquaht Nation as party in the forest agreement as the aboriginal perspective is expected to bring new ideas and innovation to the resource management of the area. The Stopper Islands are identified as an area of particular focus for conservation of cultural heritage resources. Management in the Stopper Islands requires strategies that preserve specific cultural heritage resources and spiritual values associated with mature forests

6.6.2 Objectives

Respect and safeguard special cultural features and maintain opportunities for aboriginal and non-aboriginal people to continue cultural practices associated with the forests.

6.6.3 Strategies to meet objectives

- Members of the Toquaht Nation will have seats on the Board of Directors of the BCF Corporation.
- The BCF Corporation will provide access to the community forest land base to support the First Nations objective of creating jobs and economic opportunity via the harvesting of non-timber forest resources and ecotourism. Insofar as the Community Forest License allows, the BCF Corporation will endorse harvesting of non-timber forest resources by members of the First Nations.
- The BCF Corporation will work closely with the First Nations to identify and protect archaeologically and spiritually significant areas within the community forest area.
- Insofar as the Community Forest License allows, the BCF Corporation will allow unlimited access to the community forest land base for First Nation members to exercise their aboriginal rights.
- For the Stopper Islands, the chief of the Toquaht Nation, or their representative, will review all harvesting plans.
- Harvesting in the Stopper Islands is restricted to removal of individual trees for cultural purposes.
- Recreation, education, and tourism will be restricted to activities that respect the cultural heritage and spiritual values of the Stopper Islands.

6.7 Wildlife Objectives

6.7.1 Background Information

There is a large diversity of wildlife species that must be considered when managing for wildlife in the BCF.

Although the government targets management of ungulates by reserving areas for Ungulate Winter Ranges (UWR), and manages Marbelled Murrelets (MAMU) with set asides, most management occurs by setting aside large patches of old growth (OGMAs), reserving riparian areas, or setting aside a percentage of areas within or adjacent to cutblock for wildlife tree retention areas. Large “wolf” trees are also often reserved as they have a higher wildlife value than wood value. Among the large diversity of species found, the following tables list red and blue listed species that *may* be found in the BCF tenure.

Table 1: Red and Blue Listed Terrestrial Species (BC Species and Ecosystems Explorer).

Scientific Name	English Name	BC Status
<i>Abronia latifolia</i>	yellow sand-verbena	Blue
<i>Abronia umbellata</i> var. <i>breviflora</i>	pink sand-verbena	Red
<i>Accipiter gentilis laingi</i>	Northern Goshawk, <i>laingi</i> subspecies	Red
<i>Allium geyeri</i> var. <i>tenerum</i>	Geyer's onion	Blue
<i>Anagallis minima</i>	chaffweed	Blue
<i>Anemone drummondii</i> var. <i>drummondii</i>	alpine anemone	Blue
<i>Ardea herodias fannini</i>	Great Blue Heron, <i>fannini</i> subspecies	Blue

Scientific Name	English Name	BC Status
<i>Asplenium adulterinum</i>	corrupt spleenwort	Blue
<i>Aster curtus</i>	white-top aster	Blue
<i>Aster paucicapitatus</i>	Olympic mountain aster	Blue
<i>Botrychium simplex</i>	least moonwort	Blue
<i>Brachyramphus marmoratus</i>	Marbled Murrelet	Red
<i>Carex feta</i>	green-sheathed sedge	Red
<i>Carex gmelinii</i>	Gmelin's sedge	Blue
<i>Carex pansa</i>	sand-dune sedge	Blue
<i>Carychium occidentale</i>	Western Thorn	Blue
<i>Cervus canadensis roosevelti</i>	Roosevelt Elk	Blue
<i>Chamaesyce serpyllifolia</i> ssp. <i>serpyllifolia</i>	thyme-leaved spurge	Blue
<i>Convolvulus soldanella</i>	beach bindweed	Blue
<i>Corydalis scouleri</i>	Scouler's corydalis	Yellow
<i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat	Blue
<i>Eleocharis rostellata</i>	beaked spike-rush	Blue
<i>Epilobium glaberrimum</i> ssp. <i>fastigiatum</i>	smooth willowherb	Blue
<i>Falco peregrinus pealei</i>	Peregrine Falcon, <i>pealei</i> subspecies	Blue
<i>Fratercula cirrhata</i>	Tufted Puffin	Blue
<i>Githopsis specularioides</i>	common bluecup	Blue
<i>Glaucidium gnoma swarthi</i>	Northern Pygmy-Owl, <i>swarthi</i> subspecies	Blue
<i>Glehnia littoralis</i> ssp. <i>leiocarpa</i>	American glehnia	Blue
<i>Gulo gulo vancouverensis</i>	Wolverine, <i>vancouverensis</i> subspecies	Red
<i>Hemphillia dromedarius</i>	Dromedary Jumping-slug	Red
<i>Hemphillia glandulosa</i>	Warty Jumping-slug	Blue
<i>Heterodermia sitchensis</i>	seaside centipede	Red
<i>Hirundo rustica</i>	Barn Swallow	Blue
<i>Hypericum scouleri</i> ssp. <i>nortoniae</i>	western St. John's-wort	Blue
<i>Juncus oxymers</i>	pointed rush	Blue
<i>Lasthenia maritima</i>	hairy goldfields	Blue
<i>Lathyrus littoralis</i>	grey beach peavine	Red
<i>Meconella oregana</i>	white meconella	Red
<i>Megascops kennicottii kennicottii</i>	Western Screech-Owl, <i>kennicottii</i> subspecies	Blue
<i>Mimulus dentatus</i>	tooth-leaved monkey-flower	Red
<i>Mitella caulescens</i>	leafy mitrewort	Blue
<i>Monadenia fidelis</i>	Pacific Sideband	Blue
<i>Montia diffusa</i>	branching montia	Red
<i>Mustela erminea anguinae</i>	Ermine, <i>anguinae</i> subspecies	Blue
<i>Myrica californica</i>	California wax-myrtle	Blue

Scientific Name	English Name	BC Status
<i>Ophioglossum pusillum</i>	northern adder's-tongue	Blue
<i>Oxalis oregana</i>	redwood sorrel	Blue
<i>Patagioenas fasciata</i>	Band-tailed Pigeon	Blue
<i>Pleuricospora fimbriolata</i>	fringed pinesap	Red
<i>Pleuropogon refractus</i>	nodding semaphoregrass	Blue
<i>Polygonum paronychia</i>	black knotweed	Blue
<i>Pristiloma johnsoni</i>	Broadwhorl Tightcoil	Blue
<i>Prophyaon vanatta</i>	Scarletback Taidropper	Blue
<i>Prosartes smithii</i>	Smith's fairybells	Blue
<i>Psilocarphus elatior</i>	tall woolly-heads	Red
<i>Ptychoramphus aleuticus</i>	Cassin's Auklet	Blue
<i>Rana aurora</i>	Red-legged Frog	Blue
<i>Rubus nivalis</i>	snow bramble	Red
<i>Rupertia physodes</i>	California-tea	Blue
<i>Salix sessilifolia</i>	soft-leaved willow	Blue
<i>Scrophularia lanceolata</i>	lance-leaved figwort	Blue
<i>Selaginella oregana</i>	Oregon selaginella	Red
<i>Trillium ovatum</i> var. <i>hibbersonii</i>	dwarf trillium	Red
<i>Tyto alba</i>	Barn Owl	Blue
<i>Uria aalge</i>	Common Murre	Red
<i>Viola howellii</i>	Howell's violet	Blue

Table 2: Red and Blue listed species associated with Lakes and Rivers (BC Species and Ecosystems Explorer).

Scientific Name	English Name	BC Status
<i>Ardea herodias fannini</i>	Great Blue Heron, <i>fannini</i> subspecies	Blue
<i>Bolboschoenus fluviatilis</i>	river bulrush	Red
<i>Botrychium simplex</i>	least moonwort	Blue
<i>Brachyramphus marmoratus</i>	Marbled Murrelet	Red
<i>Butorides virescens</i>	Green Heron	Blue
<i>Carex feta</i>	green-sheathed sedge	Red
<i>Carex pansa</i>	sand-dune sedge	Blue
<i>Ceratophyllum echinatum</i>	spring hornwort	Blue
<i>Ceratophyllum echinatum</i>	spring hornwort	Blue
<i>Chamaesyce serpyllifolia</i> ssp. <i>serpyllifolia</i>	thyme-leaved spurge	Blue
<i>Chrysemys picta</i> pop. 1	Western Painted Turtle - Pacific Coast Population	Red
<i>Corydalis scouleri</i>	Scouler's corydalis	Yellow
<i>Crassula aquatica</i>	pigmyweed	Blue

Scientific Name	English Name	BC Status
<i>Elatine rubella</i>	three-flowered waterwort	Blue
<i>Eleocharis parvula</i>	small spike-rush	Blue
<i>Eleocharis rostellata</i>	beaked spike-rush	Blue
<i>Epilobium glaberrimum</i> ssp. <i>fastigiatum</i>	smooth willowherb	Blue
<i>Falco peregrinus pealei</i>	Peregrine Falcon, <i>pealei</i> subspecies	Blue
<i>Githopsis specularioides</i>	common bluecup	Blue
<i>Hirundo rustica</i>	Barn Swallow	Blue
<i>Hypericum scouleri</i> ssp. <i>nortoniae</i>	western St. John's-wort	Blue
<i>Mitella caulescens</i>	leafy mitrewort	Blue
<i>Montia chamissoi</i>	Chamisso's montia	Blue
<i>Myriophyllum quitense</i>	waterwort water-milfoil	Blue
<i>Myriophyllum ussuriense</i>	Ussurian water-milfoil	Blue
<i>Oncorhynchus clarkii clarkii</i>	Cutthroat Trout, <i>clarkii</i> subspecies	Blue
<i>Ophioglossum pusillum</i>	northern adder's-tongue	Blue
<i>Pachydiplax longipennis</i>	Blue Dasher	Blue
<i>Polygonum hydropiperoides</i>	water-pepper	Blue
<i>Rana aurora</i>	Red-legged Frog	Blue
<i>Salix sessilifolia</i>	soft-leaved willow	Blue
<i>Salvelinus malma</i>	Dolly Varden	Blue
<i>Sorex palustris brooksi</i>	American Water Shrew, <i>brooksi</i> subspecies	Red
<i>Sparganium fluctuans</i>	water bur-reed	Blue
<i>Sympetrum vicinum</i>	Autumn Meadowhawk	Blue
<i>Trillium ovatum</i> var. <i>hibbersonii</i>	dwarf trillium	Red
<i>Viola howellii</i>	Howell's violet	Blue

6.7.2 Objectives:

Conduct operations to not threaten the maintenance of all native species across their range; maintain or enhance viable populations of wildlife endemic to the community forest; and designate and protect known critical wildlife habitat features such as nesting, denning, food source or breeding habitat requirements vital to health, and/or recovery of one or a variety of species.

6.7.3 Strategies to meet objectives

-  Where possible restore critical habitats for red/blue listed, focal and other important wildlife species.
-  Support development of recovery plans for red and blue listed species.
-  Help maintain sufficiently distributed habitat to sustain healthy populations and individuals of red/blue listed and focal species.

- 🌲 Respect provincially designated Wildlife Habitat Areas (WHAs), OGMAs, UWRs, and MAMUs.
- 🌲 Reserve a minimum level of retention in or around each cutblock for Wildlife Tree Retention Areas (WTRA) to maintain stand level structural diversity.
- 🌲 Maintain functioning riparian areas including streams, lakes and wetlands.
- 🌲 Maintain visual cover for ungulates where appropriate.
- 🌲 Buffer and protect active or recently used bear dens where they are located during cutblock layout.
- 🌲 Creation of old growth characteristics and wildlife habitats in areas where the required diversity is lacking (mainly areas of similarly aged second growth stands) will be considered where funding for this type of forest enhancement activity can be obtained.

6.8 Botanical Forest Products Objectives

6.8.1 Background Information

Non-timber resources have not been used to any great extent in the area. There is opportunity for the harvest of items such as mushrooms, foliage, bark, medicinal plants, berries and wild craft supplies.

Botanical Forest Products commercial harvest opportunities include the following:

Floral Evergreens: Salal, Conifer Boughs, Huckleberry Branches, Sphagnum and Maple Tree Mosses, Willow Tips and Branches

Edibles:

Mushrooms: White and Yellow Chanterelles, Hedgehogs, Pine, Yellow Feet

Berries: Huckleberry, Blackberry, Salal, Salmon Berry

Other: Fiddleheads, Cascara Bark, Oregon Grape Roots

As with all natural resources, harvesting pressure is a concern for botanical forest products and may cause the extirpation of species from the Barkley Sound area. Species known to have experienced these pressures include salal, moss, tree boughs, and wild berries.

As well, timber harvesting has been known to cause a loss of habitat for salal, moss, and mushrooms, reducing the quantity and quality available to the botanical forest products industry.

Although the BCF would like to manage the non-timber forest resources in their tenure area, there is no legal mechanism to licence or control the harvesting of botanical forest products. Thus, the BCF is limited in its ability to manage the people working with the resource. The community forest can control the effect of harvesting on the resource, where practical maintain road access to non-timber forest products areas, promote sustainable harvesting techniques through educational opportunities, and encourage botanical forest product businesses.



6.8.2 Objectives

The BCF will utilize adaptive resource management to meet stewardship responsibilities of non-timber forest resources in a manner that works towards integrating best practice silviculture management along with creating innovative best practice standards for the sustainable harvesting of non-timber forest products for the economic diversification of the region.

6.8.3 Strategies to meet objectives

- 🌲 Identify opportunities for non-timber resources and facilitating the creation of new enterprises.
- 🌲 Incorporate botanical product harvesting interests in access management plans.
- 🌲 Management of botanical products will be integrated with timber management and with other non-timber management objectives, such as trails, eco-tourism and cultural heritage resource access by First Nations.
- 🌲 Seek funding to conduct relative abundance inventory assessments to determine what potential botanical species are within the community forest that are of sufficient abundance to sustainably utilize for economic diversification goals that do not create adverse impacts on other non-timber values of the community forest.
- 🌲 Facilitate collaboration and partnerships to provide opportunity for non-timber forest resource demonstration projects, harvesting training, applied research opportunities for industry sector businesses and academic institutions, and public education.

6.9 Visual Landscape Objectives

6.9.1 Background Information



Everyone who visits the west coast remarks that the area is absolutely stunning so it is easy to understand that the maintenance of visual aesthetics is very important to the community. Visual aesthetics will be a priority when harvesting plans are being developed.

There are minor opportunities to view the BCF from the Pacific Rim National Park – Broken Group Islands. The Maggie Lake corridor is partially visible to the Toquaht Bay and Broken Group Islands areas. It is the intent of the BCF to maintain scenic qualities in areas

of high aesthetic value and integrate visual design principles throughout community forest in keeping with level of scenic importance.

6.9.2 Objectives

Mitigate the visual impact of harvesting and road building in scenic areas.

6.9.3 Strategies to meet objectives

- 🌲 Plan cutblocks to meet the categories of alteration allowed in the Visual Landscape Inventory.
- 🌲 Incorporate visual design characteristics.
- 🌲 Minimize road density and widths.

6.10 Biodiversity Objectives

6.10.1 Background Information

The overlap between the Maggie LU (RMZ 40) and the BCF is 6421 ha, or 95% of the BCF area. This area has been assigned a low Biodiversity Emphasis Option (BEO), this is appropriate for areas where other social and economic demands, such as timber supply, are the primary management objectives. This BEO fits well with the objectives of the community forest.

The overlap between the BCF and the Toquart LU (RMZ 39) is 173 ha, or 2.5% of the BCF area. This area has been assigned an intermediate BEO which means that, relative to other LUs on Vancouver Island, biodiversity planning should strive for a trade-off between biodiversity conservation and timber production.

The list of management options for BEOs is listed in Table 3: Biodiversity Emphasis Range of Management Options.

There are many types of biodiversity in a forest including genetic diversity and species diversity within and between species. Biodiversity is measured at the landscape level, and on a forest stand by stand level.

Maintaining forest structure and function is the primary method used to maintain biodiversity.

Table 3: Biodiversity Emphasis Range of Management Options

Biodiversity factors and recommendations	Range of management alternatives		
	Forest Practices Code with <i>Biodiversity Guidebook</i> options		
	Lower biodiversity emphasis	Intermediate biodiversity emphasis	Higher biodiversity emphasis
Risk to biodiversity	higher	intermediate	lower
Timber impact	lower	intermediate	higher
% Old seral area ^a	(natural %–12%) x .5	(natural %–12%) x.5	(natural %–12%) x .75
% Mature seral area ^a	25% of natural	50% of natural	75% of natural
% Early seral area ^a	no limit ^b	2 x natural	1.5 x natural
Patch size distribution	Distribution as recommended	Distribution as recommended	Distribution as recommended
Connectivity and linkages	FENs up to % target for old seral area	FENs as recommended	FENs as recommended
% area in forest interior conditions	10–25% of old forest area	25–50% of old forest area	25–50% of old forest area
WTP area ^c	WTP ^d as recommended	WTP ^d as recommended	WTP ^d as recommended
WTP inter-patch distance	500 m	500 m	500 m
CWD ^e	50% natural	50% natural	50% natural

6.10.2 Landscape Level Biodiversity

6.10.2.1 Background Information

Forest structure can be maintained on the landscape level by preserving forests with a variety of ages and characteristics. The Maggie and Toquart LU plans have been completed in draft form and addresses the preservation of biodiversity by maintaining large area of old growth in these LUs.

In a cutblock, standing retention of wildlife trees, WTRAs, and riparian areas provide structure such as standing and dead trees, rock outcrops, wet areas, and deciduous patches.

6.10.2.2 Objectives

Maintain natural diversity of species, ecosystems, serial stages and ecosystem functions across scales and through time.

6.10.2.3 Strategies to meet objectives

-  Retain a range of sizes of downed wood debris, including large pieces, in harvest blocks where coarse woody debris is determined to be of ecological importance.
-  Develop management strategy for maintaining rare ecosystems and prioritize rare ecosystems to be included in riparian reserves, wildlife tree patches, sensitive site protection areas, and visual management reserves.
-  Pursue funding opportunities to inventory Terrestrial Ecosystems of the community forest.

- 🌲 Where appropriate, design harvesting to approximate natural disturbance pattern and distribution and maintain structural attributes at the stand level.
- 🌲 Incorporate ecosystem restoration opportunities with development plans where possible and pursue restoration funding opportunities.
- 🌲 Ensure consistency with maximum cutblock size and adjacent stand green-up requirements under prevailing legislation.
- 🌲 Promote temporal diversity by increasing the forest composition in the absent 41-140 year age classes.

6.10.3 Stand Level Biodiversity

6.10.3.1 Objectives

Retain structural variety in every cutblock through the preservation of wildlife trees and riparian areas.

6.10.3.2 Strategies to meet objectives

- 🌲 Reserve a minimum level of retention in each cutblock for WTRA to maintain stand level structural diversity.
- 🌲 Plan cutblocks using the retention silviculture system and place a portion of reserve areas in Riparian Management Areas.
- 🌲 Where practicable, in second growth cutblocks with little diversity in species and structure, plan for the WTRA to be in an area with characteristics suitable for old growth recruitment (planning for second growth to take on characteristics of old growth forests).

6.11 Soil Conservation Objectives

6.11.1 Background Information

Productive soils are not only important for growing the next forest, mitigating soil disturbance reduces siltation into streams which affects water quality. Soils hold water and are necessary for conserving and filtering water resources.

6.11.2 Objectives

Conserve the productivity and the hydrologic function of soils.

6.11.3 Strategies to meet objectives

- 🌲 Conduct terrain stability assessments on potentially unstable (class 4) and unstable (class 5) terrain to avoid slope failure.
- 🌲 Avoid using ground-based equipment on areas of sensitive soils.
- 🌲 Use low ground pressure equipment.
- 🌲 Minimize access structures in both width and extent.
- 🌲 Develop and follow “wet-weather shut down guidelines”.
- 🌲 Favour bucking and limbing old growth timber in the stand rather than at roadside to maintain soil productivity.
- 🌲 When practical, disperse harvesting debris over the area rather than piling and burning.

- 🌲 Rehabilitate soils where legislated disturbance levels are exceeded.

6.12 Educational Opportunities

6.12.1 Background Information

Forestry education increases public awareness of issues in forest management. It allows stakeholders to work with forest tenure holders and managers to make well-informed, and balanced decisions taking all issues into account.

Additionally, education to provide workers with skills in the forest industry will benefit the BCF as well as the local community.

6.12.2 Objectives

Educate the public on the benefits to the local region and province from forestry. Assist in education of workers for careers in the forest industry.

6.12.3 Strategies to meet objectives

- 🌲 Assist in providing opportunities for enhancement of local availability of skilled labour, management, and services.
- 🌲 Portions of community forest are made available for educational demonstration of forest stewardship practices.
- 🌲 Ensure the BCF website is current with information on forest management activities within the community forest.

When volunteer assistance is available and funding can be obtained, the following strategies may be used:

- 🌲 Sponsor a tree growing contest with Grade 5's; the winning class gets a free forestry tour.
- 🌲 Participate in Ukee Days and other appropriate community events.
- 🌲 Sponsor a guest speaker, on a topical issue – i.e. log exports, value-added, non-timber forest products.
- 🌲 Post reforestation signs (e.g. harvest 2010, planted 2011) for harvested cutblocks.
- 🌲 Create a public information booth about sustainable harvesting of timber and non-timber forest products.



6.13 Tourism Opportunities

6.13.1 Background Information

In 1959, a rough road from Port Alberni to Ucluelet was completed. Today, this road is Highway 4 which hosts a million tourists a year coming to the west coast for a holiday adventure filled with sand, surf, breath-taking mountain views, and a myriad of recreational opportunities from sea kayaking, to mountain climbing.

6.13.2 Objectives

Support and enhance tourism opportunities both within and adjacent to the community forest.

6.13.3 Strategies to meet objectives

- 🌲 Work with the local communities, business organizations, and First Nations, to develop a local “Community Forest Centre” at the “Gateway to Pacific Rim” (Highway 4 Ucluelet/Tofino junction) as a place to showcase to the world local sustainable forestry practices, First Nations cultural activities (i.e. carving shed for totems, canoes, etc.), a value added wood village, research and education, ecosystem restoration and much more.
- 🌲 Identify and protect special features like trails, unique waterfalls, view spots, cultural sites or unique natural sites having tourism or recreational value.
- 🌲 Incorporate tourism and recreation interests in access management plans.
- 🌲 Incorporate tourism and recreation sector interests in forestry plans.
- 🌲 Support initiatives for the development and maintenance of trails and recreation sites.
- 🌲 Strategies to encourage tourist use of the community forest are the same as those noted in sections 6.5.3 (Recreation Objectives) and 6.9.3 (Visual Landscape Objectives).

7. Provincial CFA Program Objectives and Management Strategies

- *Provide long-term opportunities for achieving a range of community objectives, values and priorities.*

A long-standing goal of the communities living on the west coast of Vancouver Island has been to gain greater certainty through direct control and management forest resources. The District of Ucluelet and the Toquaht Nation see this twenty five year term CFA as being a small but important step towards the creation of greater certainty for their communities over the long term.

The community forest will be a well-managed forest area, with management based on values, priorities, and objectives from stakeholders rather than a focus on management for profit to shareholders. Local communities will benefit from the community forest as values outlined during community consultation have been employed to produce a holistic management plan that primarily addresses the need

for local forest employment where forest operations are carried out under a philosophy of environmental and social sustainability. The strategy will be to continue this broad based stakeholder engagement over the long term, through processes like the Forest Stewardship Plan public review and annual BCF open house meetings to incorporate a wide range of objectives, values and priorities from the community.

- *Diversify the use of and benefits derived from the community forest agreement area.*

The proposed land base has historically had a diversity of users benefiting from access to forest resources. The strategy will be for BCF to continue to provide diverse opportunities to locals and non-locals to enjoy the forest as a model of mixed-use forest management.

The community forest will support local small timber and non-timber forest products businesses by providing access to the land base and/or facilitate access to small quantities of logs or single trees as well as botanical forest products. This access can multiply into downstream benefits in the form of small scale job creation and increased tourism potential.

- *Promote community involvement and participation.*

The community of Ucluelet has endeavored to obtain a licence to manage adjacent crown forest resources for over ten years. During this time community input into the community forest vision was obtained in the following ways:

- In 1996 and 1997 a series of community visioning workshops included a session on a vision for a community forest, for promoting botanical forest products businesses, as well as vision for other businesses that could be centered on a community forest land base such as a Toquaht Nation tourism business. Representatives from the following communities attended: The Toquaht Nation, the Ucluelet First Nation, the District of Ucluelet, Millstream, Port Albion, and Salmon Beach. Input from these workshops were used to define the terms of reference for the 1999 application for a community forest pilot project for the District of Ucluelet and are also used for this application.
- In late 2004 when the District of Ucluelet was originally invited to submit an PCAFA application a public consultation process was re-initiated and extensive community involvement was sought by the Ucluelet Economic Development Corporation (UEDC) for the land base that now makes up the joint community forest proposal. In 2005 almost 200 residents and organizations from the town of Ucluelet wrote community forest support letters or filled out a community forest support letter form. Although the support sought did not explicitly solicit information on desired community forest management objectives and priorities, the form included a “comments” section. It was clear from these comments that supporters desired the restoration of forest jobs to the community and enhancing economic diversity over other forest values.
- Using the 2005 public input, as well as input from direct meetings with members of the Toquaht Nation, a Management Plan for the BCF was formed. This was presented at a public open house December 2, 2008 and feedback

was positive that the Management Plan captured the objectives and priorities for a community forest for the Barkley Sound area managed by the District of Ucluelet and the Toquaht First Nation.

The strategy will be to appoint board members to the BCFC who are from and accountable to the local community and to hold at least one open house per year for public engagement. Use of the BCF website will also serve as a major portal to promote community involvement and participation.

- *Provide social and economic benefits to British Columbia.*

The strategy is BCF will provide stumpage revenue to the people of British Columbia from an harvest level up to 27,000 m³/year and will promote non-forest value added businesses using the resources found in the BCF. The resource use is expected to provide small scale social and economic benefits to the local community. It is anticipated that some products will be transported to other areas of Vancouver Island where they will be used to enhance their economies.

Financial profits from the community forest, if any, will be returned to the communities for community projects that are aligned with the BCF vision to provide forest-based opportunities and economic stability for the community, or that enhance public amenities and quality of life.

Public benefits will also be available in the form of land set-asides for non-timber values important for stream protection, protection of cultural heritage resources, old growth, wildlife, visuals, and biodiversity. These areas may coincide with recreational areas that also provide social benefit to stakeholders.

- *Undertake community forestry consistent with sound principles of environmental stewardship that reflect a broad spectrum of values.*

The District of Ucluelet underwent an extensive public awareness campaign which attracted comments from people from many walk of life within the region. The Management Plan objectives were derived from the resulting community discussions and letters, open house feedback, and legislated requirements reflecting objectives of the people and government of British Columbia.

The residents of Ucluelet and the Toquaht Nation have their unique vision of environmental care and stewardship. The Management Plan ties together the diverse ideals and optimizes values consistent with a community forest vision. The strategy is to harvest within the calculated sustainable AAC and continue the already demonstrated efforts to address a broad range of community values.

- *Foster innovation.*

The strategy is to develop the community forest as a showcase for innovative forest practices which combine activities of multiple land-users on a small land base. Additionally, the land base is accessible to the community for non-timber forest products management, as a source of logs for minor wood users creating value added products in the community, for carbon sequestration, and possibly for the sales of carbon credits if the opportunity arises in the future.

- *Advocate forest worker safety.*

The strategy is to require all contracted workers have WorkSafe BC coverage and be “SafeCertified” or registered to be so, by the BC Forest Safety Council.

- *Promote communication and strengthen relationships between Aboriginal and non-Aboriginal communities and persons.*

The community forest initiative is a partnership between the Toquaht Nation and the District of Ucluelet. As such, management will reflect values important to both communities. Additionally, there are both aboriginal and non-aboriginal advisors to the partners. Therefore, the management and business plans in this application will put in place a strong foundation for an on-going relationship between the aboriginal and non-aboriginal community. The strategy will be to continue to work with TN to grow the BCF as a jointly held enterprise with DoU and to refer stewardship plans to all First Nations with traditional territory or treaty interests overlapping the community forest area.

8. Proposed Allowable Annual Cut

The AAC proposed for the community forest is based on the TSA report for the joint community forest area prepared by Forsite (November 2007).

The AAC calculated by Forsite is 27,000 m³ per year. The calculation of the AAC considered legislated constraints, as well as physical constraints of the landscape, and biological constraints of species to be managed.

TSA calculations proposing an AAC for the BCF also considered the following:

- (i) inventories,
- (ii) timber harvest specifications proposed for the timber resources in the agreement area,
- (iii) reductions that are necessary to facilitate the management and conservation of non-timber resource values in the agreement area, including visual quality, biological diversity, soils, recreation resources, cultural heritage resources, range land, wildlife, water and fish habitats,
- (iv) silviculture practices and forest health factors that may impact on timber production,
- (v) the anticipated impact of the reductions to the productive portion of the agreement area due to permanent roads, landings, pits and trails, and
- (vi) any other factors that may impact on the AAC during each year.

The TSA calculations from the Forsite report links well with the BCFA Forest Management Objectives. There are minor differences that are not fully accounted for – the low rate of high retention harvest on the Stopper Islands for example is not represented in the analysis, but that impact is expected to be very small due to the small contribution of area

of the Islands to the total BCFA landbase. The impact of Old Growth Management Area, (OGMA), is likely exaggerated in the TSA as all of the draft OGMA areas were netted out, when in fact they are available for harvest, providing the non-spatial Landscape level targets for old growth are met.

The harvest profile will need to include western hemlock, if the 27,000 m³ AAC is to be achieved. This includes both old growth and second growth stands. The same is to be said for second growth Douglas-fir from sites now considered to be “off-site” for that species. In support of the assumption these stands will be harvested, there is evidence to suggest harvesting this type of timber profile can be economic. There has been a significant volume of this type of western hemlock and Douglas-fir harvested in the past several years from both private land, (Island Timberlands), and crown land (TFL54 and TFL57), in the vicinity of the BCF. The increasing importance of demand from Asian markets for this type of wood has created positive harvest economics here they were negative just a few years ago.

Items that may have an impact on AAC determinations will be noted during the initial 5-10 year operating period for BCF so that future AAC determinations can incorporate them.

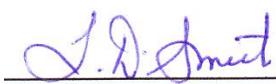
9. Management Plan Signatures

The Management Plan is signed and sealed by a Registered Professional Forester in accordance with the requirements of the Forester’s Act and by persons authorized to sign on behalf of the licensee.

Derek Drake RPF* : 

**I certify that I have reviewed this document and, while I did not personally supervise the work described, I have determined that this work has been done to the standards expected of a member of the Association of British Columbia Forest Professionals.*

Terry Smith, President, Barkley Community Forest Corporation (General Partner),
Barkley Community Forest Limited Partnership:

 per Barkley Community Forest Corporation

Appendix A. Legislation and Higher Level Plans – Guidance Documents for the Management Plan

A.1 Vancouver Island Land Use Plan Higher Level Plan

The *Land Act* and the Land Use Objectives Regulation provide for the establishment of land use objectives under the Forest and Range Practices Act (FRPA) based on requirements of the Vancouver Island Summary Land Use Plan (VISLUP).

The VISLUP established resource management zones and objectives including Special Management Zones (SMZ), was not a legal document. The BCF is divided into two areas under the VISLUP: The Toquart LU, which is Resource Management Zone (RMZ) 39; and the Maggie LU – RMZ 40. The VISLUP establishes non-binding objectives for these RMZs as follows.

RMZ-39: Toquart

Location: Toquart River and Lakes drainage

Total Area: approximately 14,800 ha

Zone Category and Overall Management Direction: *General Management Zone*, with significant timber, as well as recreational and visual values; biodiversity conservation to the intermediate level of significance (retention targets: maximize overlap with areas of recreational and fish/wildlife values)

Forest Objectives and Strategies

Access:

Objective: *General Access Management*

Biodiversity:

Description: this zone is comprised by the Toquart draft landscape unit, which also encompasses portions of the Barkley Sound SMZ; high proportion of old forests; potential for connectivity function

Objective: *General Biodiversity Conservation Management*

Strategies: capture old seral forest in non-contributing areas, as well as areas of recreational and fish/wildlife values

Cave/Karst:

Description: dispersed pockets of cave/karst

Objective: *General Cave/Karst Management*

Community Water:

Description: Mack Creek is a designated community watershed (Toquaht Indian Band)

Objective: *Community Watershed Management*

Cultural Heritage Resources:

Objective: *General Cultural Heritage Resource Management*

Fish:

Description: high anadromous/resident values in Toquart system

Objective: *General Fish Management*

Recreation Resources:

Description: significant values and use associated with lakes, river, backcountry

Objective: *General Recreation Resource Management*

Timber:

Description: lower to moderate productivity, high proportion of mature timber

Objective: *General Timber Resource Management*

Strategies: limited opportunities for *Enhanced Timber Harvesting* may be identified at the

landscape level of planning

Tourism Resources:

Description: key access to coastal areas; coastal capability along inlet, and backcountry values in upper Toquart drainage

Objective: **General Tourism Management**

Visual Resources:

Description: associated with lakes and Mackenzie Range

Objective: **General Visual Resource Management**

Water:

Description: low equivalent clearcut area

Objective: **General Watershed Management**

Wildlife:

Description: intermediate values, ungulate winter range, coastal/marine

Objective: **General Wildlife Management**

Non-Forest Resource Descriptions

Aquaculture:

Description: very limited potential for coastal finfish or good potential for shellfish culture

Mineral Resources:

Description: moderately high potential for metallic and industrial minerals; many mineral tenures.

RMZ-40: Maggie

Location: area south of Toquart surrounding Maggie Lake and extending south to Ucluelet Inlet

Total Area: approximately 14,600 ha

Zone Category and Overall Management Direction: **Enhanced Forestry Zone**, with particular emphasis on enhanced silviculture and increased growth and yield; visual values along coast and around Maggie Lake require full integration; other values to be addressed at the basic level of stewardship in accordance with legislation and regulations; need to consider buffer adjacent to Pacific Rim National Park

Primary Forest Objectives

Timber:

Description: moderate to high productivity, mostly in second growth timber

Objective: **Enhanced Silviculture**, and very limited opportunity for **Enhanced Timber Harvesting**

Fish:

Description: intermediate values, anadromous fish in Maggie system and lower stream reaches of smaller streams

Objective: **General Fish Management**

Community Water:

Description: Mercantile Creek (Ucluelet) and Itatsoo Creek (Toquaht Indian Band) are designated community watersheds

Objective: **Community Watershed Management**

Visual Resources:

Description: coastal and Maggie Lake

Objective: **General Visual Resource Management** with emphasis along coast and around Maggie Lake

Secondary Forest Objectives

Access:

Objective: **General Access Management**

Water:

Description: generally low equivalent clearcut area

Objective: **General Watershed Management**

Recreation Resources:

Description: coastal and Maggie Lake

Objective: **General Recreation Resource Management**

Tourism Resources:

Description: coastal tourism capability, facilities in Ucluelet

Objective: **General Tourism Management** in above areas

Wildlife:

Description: lower values

Objective: **General Wildlife Management**

Biodiversity:

Description: this zone is part of the Maggie and Kennedy Flats draft landscape units; basic values

Objective: **Basic Biodiversity Conservation Management**

Cave/Karst:

Description: dispersed pockets of cave/karst

Objective: **General Cave/Karst Management**

Cultural Heritage Resources:

Objective: **General Cultural Heritage Resource Management**

Non-Forest Resource Descriptions**Aquaculture:**

Description: very limited potential for coastal finfish, good potential for shellfish culture

Mineral Resources:

Description: low to moderately high metallic mineral potential; moderately high industrial mineral potential; mineral tenures exist in the north-eastern part of the area

A HLP order signed in October 2000 outlined land use objectives from the VISLUP that are legally binding under the FRPA. The HLP establishes the Maggie LU as an Enhanced Forestry Zone (EFZ) and outlines legal objectives and strategies for harvesting:

- To increase the short-term availability of timber,
 - (a) a cutblock may be larger than 40 ha pursuant to section 11(2)(a) of the OPR; and
 - (b) pursuant to section 68(4) of the OPR, a cutblock is greened-up if it is adequately stocked and the average height of those trees that are
 - (i) the tallest tree in each 0.01 ha plot included in a representative sample, and
 - (ii) a commercially valuable species or other species acceptable to the district manager

is at least 1.3 meters;

unless the district manager determines that a cutblock referred to under (a) or (b) would significantly impact specific hydrological, wildlife, biodiversity, scenic or recreation values.

- Avoid or mitigate adverse hydrological impacts, which may result from the practices referred to in objective 7, in watersheds with significant watershed sensitivity and significant fisheries values, as determined by the district manager and designated environment official.
- When proposing the species composition for the purposes of OPR section 39 (3) (o), a person may, pursuant to OPR section 41, select a single species that is ecologically suited to the area, if a mix of species was present on the area before the timber was harvested.
- The area that may be subject to selection of a single species pursuant to objective 9 is limited to no more than 20 per cent of the forested area of any variant within a given EFZ

The HLP order does not establish any legal objectives for the Toquart LU.

A.2 Clayoquot Biosphere Reserve

On January 21st, 2000, UNESCO officially designated the Clayoquot Sound Biosphere Reserve. The BCF area is within the area of the “Clayoquot Sound Biosphere Reserve Region”.

The BCF is part of what is considered an outer transition area to the Biosphere Reserve where sustainable resource management practices are promoted and developed.

A goal of the BCF is to “uphold the Clayoquot Sound Biosphere Reserve Charter vision and principles within the Clayoquot Sound Biosphere Reserve Region.” The vision and principles are as follows:

CLAYOQUOT SOUND UNESCO BIOSPHERE RESERVE CHARTER

This document outlines the charter for the Clayoquot Sound Biosphere Reserve, including the vision and principles that will guide actions of the signing parties in relation to the affairs of the Reserve. The charter is an integral part of the nomination. All signing parties in this nomination agree to uphold the charter and to encourage participation of all parties in the Biosphere Reserve in accordance with the vision and principles outlined below. The direct beneficiaries of legacies associated with the Reserve are the people of the Ahousaht, Hesquiaht, Tla-o-qui-aht, Toquaht and Ucluelet First Nations, the people of Tofino and Ucluelet, and the people of Long Beach who reside within the territory of the Central Region

THE VISION

A UNESCO Biosphere Reserve is established in Clayoquot Sound in recognition of regional initiatives that seek to balance protection of the environment with support or a sustainable regional economy. The designation is based upon recognition, respect and acknowledgement of:

- *the rights, interests and stewardship responsibilities of First Nations and other local communities;*
- *the need for diversified local economies, including renewed and vibrant fisheries and forestry sectors, tourism, aquaculture and new opportunities, and for community access to local resources;*
- *the need to better understand natural and economic processes through the application of traditional and local knowledge and scientific research, inventory and monitoring efforts;*
- *the training and education requirements of local people, and opportunities for researchers and students from around the world; and*
- *the role of youth and elders in designing a sustainable future.*

PRINCIPLES

1. The Biosphere Reserve and associated initiatives will be a positive focus for partnerships among First Nations, other local communities and all parties that support a sustainable future for the people of Clayoquot Sound, the surrounding region and the world.
2. The Biosphere Reserve will encourage the ongoing social, cultural and economic development needed to sustain healthy communities in the region.

3. The designation, zonation model and any processes or initiatives associated with the Biosphere Reserve are without prejudice to the interests, rights and title of the Nuu-chah-nulth Central Region First Nations and to ongoing treaty negotiations and outcomes.
4. The UNESCO Man and Biosphere zonation model will be used by all parties solely as a consideration in established or future land and resource planning processes or treaty negotiations, where decisions are appropriately made on ownership, jurisdiction and designations; the zonation model outlined in the nomination will evolve in accordance with decisions reached in these duly sanctioned forums and will not be construed to limit or direct decisions on land or resource designations.
5. The designation will support local decision-making initiatives and structures, including those of First Nations, local governments and regional authorities. The designation will be used to promote a sustainable regional economy and environmental health; it will not be used by any party to supplant existing businesses, industries or institutions or to limit current or proposed economic activity or transportation or property rights in the region.
6. The designation will be used to promote new opportunities in research, education and training, and to support related initiatives and new partnerships among First Nations, local communities, institutions, businesses and other parties.
7. The Biosphere Reserve will benefit youth in the region, both directly through education and training initiatives and through associated community programs.
8. The designation will be used to create opportunities to develop appropriate infrastructure in the region in order to support a diversified economy and new institutional initiatives.
9. The designation will be used to promote the region and its products around the world.
10. The Biosphere Reserve and associated initiatives will recognize and support the authority of First Nations, local governments and provincial and federal governments; the designation relinquishes no authority to other bodies, and ongoing involvement in the World Network of Biosphere Reserves will be at the discretion of the signing parties.

A.3 Forest and Range Practices Act

Under FRPA objectives for resource management have been proposed by government. Strategies to achieve objectives, and expected measurable results for relevant forest and non-forest resources are outlined by each licensee in their Forest Stewardship Plans (FSP).

"result" means a description of (a) measurable or verifiable outcomes in respect of a particular established objective, and (b) the situations or circumstances that determine where in a forest development unit the outcomes under paragraph (a) will be applied;

"strategy" means a description of (a) measurable or verifiable steps or practices that will be carried out in order to meet a particular established objective, and (b) the situations or circumstances that determine where in a forest development unit the steps or practices will be applied.

Under FRPA an FSP must propose results and strategies that address objectives set by government (OSBG). OSBG includes objectives prescribed in the *Forest Planning and Practices*

Regulation (FPPR) and ones established under the *Land Act*. The OSBG in the FPPR are limited to the following subjects:

- (a) soils;
- (b) visual quality;
- (c) timber;
- (d) forage and associated plant communities;
- (e) water;
- (f) fish;
- (g) wildlife;
- (h) biodiversity;
- (i) recreation resources;
- (j) resource features; and
- (k) cultural heritage resources.

OSBG under the FPPR can be viewed at the following link

<http://www.for.gov.bc.ca/tasb/legsregs/frpa/frparegs/forplanprac/fppr.htm#part2-div1>.

The Management Plan must be consistent with the Acts, regulations, and standards in effect at the time the plan was prepared. Thus, the Management Plan and any additional proposed objectives must be consistent with FRPA, and with the OSBG. The TSA included with the Management Plan must take into account net-downs resulting from proposed FSP results and strategies to address OSBG and practice requirements (strategies) legislated in the FRPA.

For the BCF the Management Plan objectives and the results and strategies to achieve objectives provide the terms of reference for the TSA and the resulting AAC determination. However, these are prepared with a future FSP in mind as the BCF area cannot be covered by a FSP until a licence agreement is established.

A.4 FPPR Practice Requirements

The FPPR practice requirements are strategies to achieve outcomes outside of the FSP that must be followed by the licensee (unless an exemption is granted). These can be found at the following link: <http://www.for.gov.bc.ca/tasb/legsregs/frpa/frparegs/forplanprac/fppr.htm#part4>. Practice requirements are predetermined steps to take to achieve OSBG. For example, FPPR s. 36 requires that “an agreement holder must ensure that the area in a cutblock that is occupied by permanent access structures built by the holder or used by the holder does not exceed 7% of the cutblock.” This practice requirement is aimed to achieve an OSBG to “to conserve the productivity and the hydrologic function of soils.”

The BCF Management Plan AAC calculation must take into account any practice requirements that will reduce the available Timber Harvesting Land Base (THLB).

Barclay Community Forest Area

Timber Supply Analysis Report

Submitted to:



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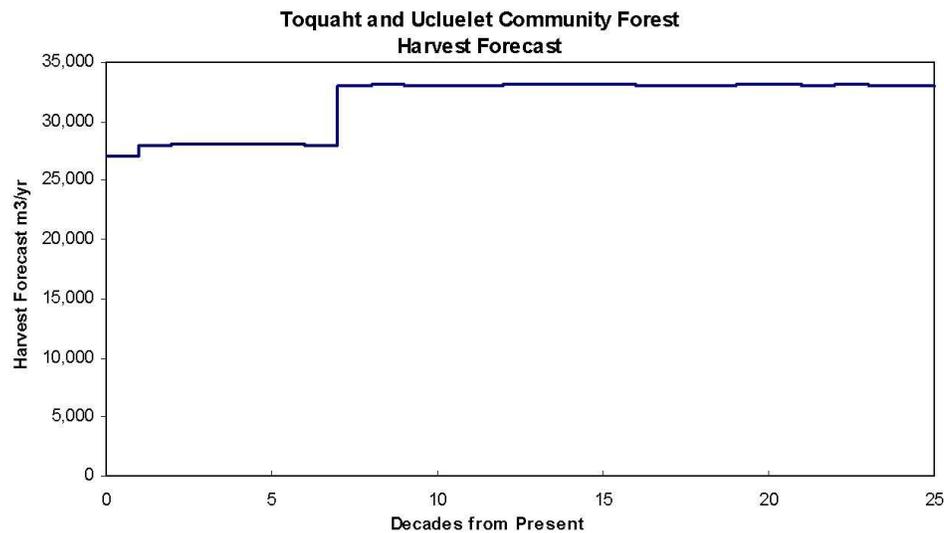
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November 30 2007

Executive Summary

This report provides a timber supply forecast for the proposed Barclay Community Forest Agreement (CFA) area located near the community of Ucluelet on Vancouver Island. The total size of the reconfigured CFA area is 6,790 ha, of which 6,424 ha (94.6%) is crown forested land base (CFLB), and 4,803 ha (70.7%) is considered the timber harvesting land base (THLB).

Timber supply was modeled spatially over 250 years using both Weyerhaeuser's TFL 44 Management Plan 4 (June 2002) and Arrowsmith TSR 2 (September 2001) assumptions to define the THLB. TSA assumptions were used to guide growth and yield, and management assumptions/strategies. The figure below illustrates the projected harvest flow over time and indicates that an initial average harvest level of 27,000 m³ per year for one decade, increasing to 28,000 m³ per year for 6 decades, then increasing to a long term harvest level of 33,000 m³ per year.



The short term harvest flow for the Barclay CFA is heavily dependant on the harvest of the remaining natural stands existing on the land base. The short term harvest availability is also constrained by previous harvesting which limits the number of stands which meet the minimum harvest age criteria. The first 40 years of harvest is predicted to come pre-dominantly from 300-400 year old Cw (Hw) stands, on good and medium productivity sites in the first and second decades and from poor sites in the second and third decades.

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Introduction

In 1999, a major tenure transfer occurred when Weyerhaeuser Company Ltd. purchased MacMillan Bloedel Ltd. Consequently, the AAC available to the holder was reduced by 5 percent and this volume (48,994 m³) was to be reallocated to the Arrowsmith Timber Supply area. A portion of the area was located on the West Coast and part of this area is being considered for a new Community Forest Agreement (CFA). This report describes the results from a timber supply analysis for the Barclay CFA, located near Ucluelet, British Columbia.

The Barclay CFA consists of 5,463 ha from Weyerhaeuser's¹ TFL 44 and 1,327 ha from the Arrowsmith TSA for a total 6,790 hectares located in the South Island Forest District and Arrowsmith Timber Supply Area (see Figure 1). This area was originally configured as one community forest proposal, and then split into a Northern and Southern portions, then the portions were modified, and now the modified portions are combined into one CFA again. Separate analysis reports, dated December 2006, are available for the two portions. This report describes the results of timber supply modeling for the combined CFA (the two portions shaded green and purple in the figure).

¹In February 2005 Weyerhaeuser's coastal tenures and operations were purchased by Brascan and the public land holdings were separated to form a new company called Cascadia Forest Products Limited, which was then subsequently acquired by Western Forest Products Inc.

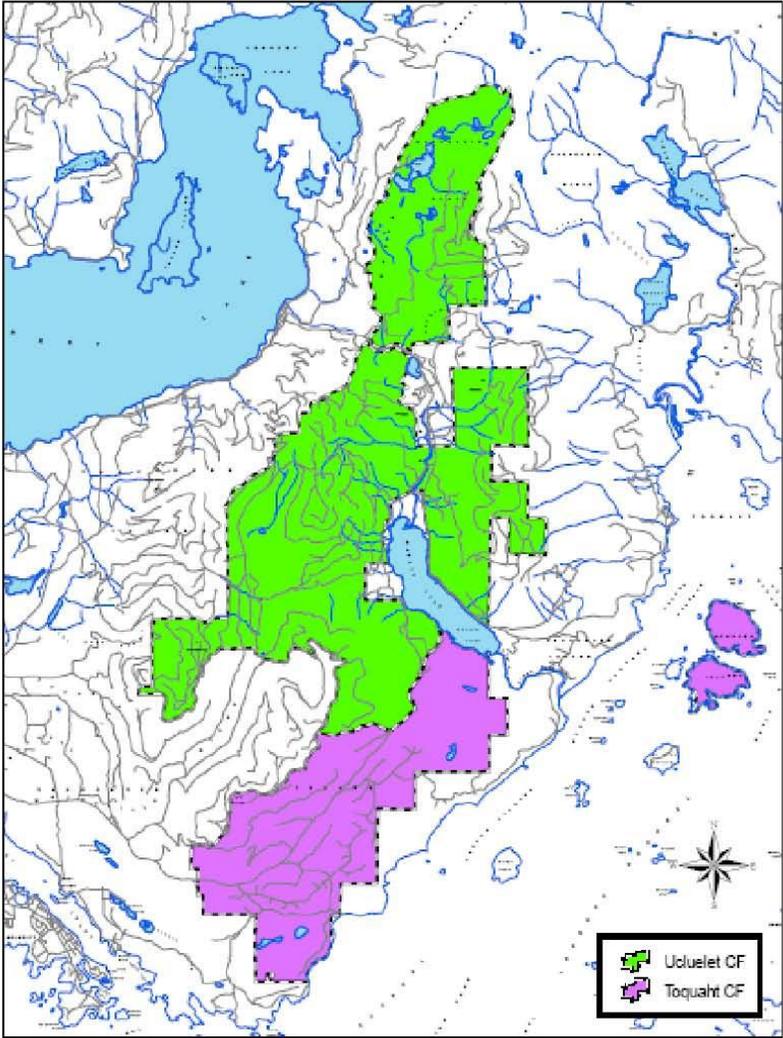


Figure 1. Barclay Community Forest (the combination of the above.)

Methods

Ministry of Forests district staff provided original boundaries for the CFA area in June 2005. This landbase was then reconfigured to identify and isolate an area that would meet the requirements of the Toquaht First Nation and the District of Ucluelet community forest proposals individually.

The data for this analysis came from both TFL and TSA lands. This required that these different data sets be merged together into a common data set to complete the modeling and analysis. Data from each area in conjunction with the associated assumptions (Management Plan 4 and TSR2) was used to net the

combined area down to a Crown Forest Land Base (CFLB) and a corresponding Timber Harvesting Land Base (THLB). Assumptions and management strategies from the Arrowsmith TSA Timber Supply Review 2 (TSR2) were then used to formulate yields specific to the land base.

The primary objective of this project is to determine and assess the long and short term timber supply for the proposed Barclay community forest.

The spatially explicit model *Forest Planning Studio* (FPS-ATLAS) was used to provide timber supply forecasts. FPS-ATLAS is a forest-level simulation model that was developed by Dr. John Nelson at the University of British Columbia. FPS-ATLAS is designed to schedule harvests according to a range of spatial and temporal objectives (i.e. harvest flows, opening size, riparian buffers, seral stage objectives and patch size distributions). Silviculture systems, rotation ages and growth and yield curves are assigned to each polygon. At each time step, polygons are first ranked according to a cutting priority (e.g. oldest first). Polygons are then harvested from this queue subject to constraints designed to meet forest level objectives (e.g. opening size and seral stage targets). Polygons are harvested until either the queue is exhausted or the periodic harvest target is met. At this stage the forest is aged to the next time period, and the process is repeated. At each time period, the model reports the status of every polygon in the forest estate.

While FPS-ATLAS is a spatially explicit timber supply model it is not the intention or objective of this analysis to produce an operational plan. A spatial model such as the one used allows visual verification of the analysis inputs and results. No spatial constraints were applied at the block level that would result in the output of realistic harvest 'blocks'. Modeling results are meant only to assess overall harvest levels in the short and long term.

The data used for timber supply input is a combination of the data used for the timber supply analysis component of Weyerhaeuser's Management Plan 4 for TFL 44 (June 2002) and Arrowsmith TSR2 (Sept 2001). The timber harvesting land base (THLB) for the community forest has been defined using the land base definitions used from each. All other assumptions are based on the Arrowsmith timber supply review (TSR2) of September 2001.

Community Forest Attribute Summary:

The proposed Barclay Community Forest Area is highly operable with 73 % of the contributing land base being operable area. The contributing land base for the proposed area totals 6,424 ha (94.7 % of the total area) and the timber harvesting land base is 4,803 ha (74.7 % of the contributing area). Table 1 below details the gross area by BEC variant.

Table 1. BEC variant classification for the CFA area.

CWHvh1	CWHvm1	CWHvm2	CFLB Total (ha)
1,483	4,665	277	6,424

Table 2 details the distribution of the THLB area by leading species group and the site index associated with the group. The average site index for the THLB area is 26.22 m.

Table 2. THLB by species group and site index.

Site Index	THLB Hectares by Leading Species Group			
	Cw	HBS	Fd	Total
9-12	194			194
13-20	1,190	76		1,266
21-28	662	661	799	2,122
29-36		763	418	1,181
37-39		4	37	41
Total	2,047	1,503	1,254	4,804
Percent of Total:	42.6	31.3	26.1	100

Table 3 describes the THLB area in terms of leading species and age class.

Table 3. THLB Area by leading species and age class

Age Class	Hectares by Leading species			
	C	HBS	FD	Total
0-20	429	680		1,110
21-40	68	619	1,253	1,939
41-60		4	2	6
61-80	5	74		79
81-100		8		8
101-120				
121-140				
141-250	353	16		369
250+	1,192	102		1,294
Total	2,047	1,503	1,254	4,804
Percent of Total:	42.6	31.3	26.1	100.0

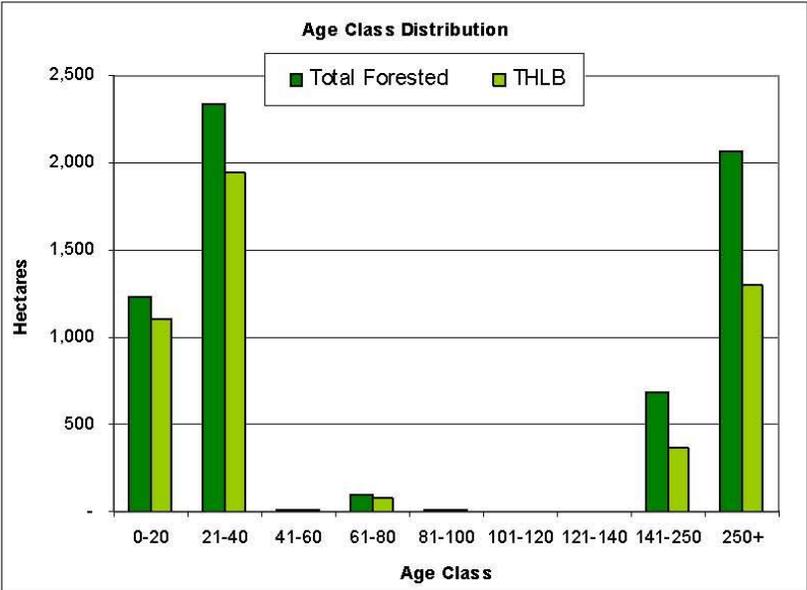


Figure 2. Current age class distribution by land base type.

Figure 2 illustrates the age class distribution on both the Crown Forested Land Base (CFLB) and the THLB. Figure 3 illustrates the spatial distribution of the age classes associated with the THLB.

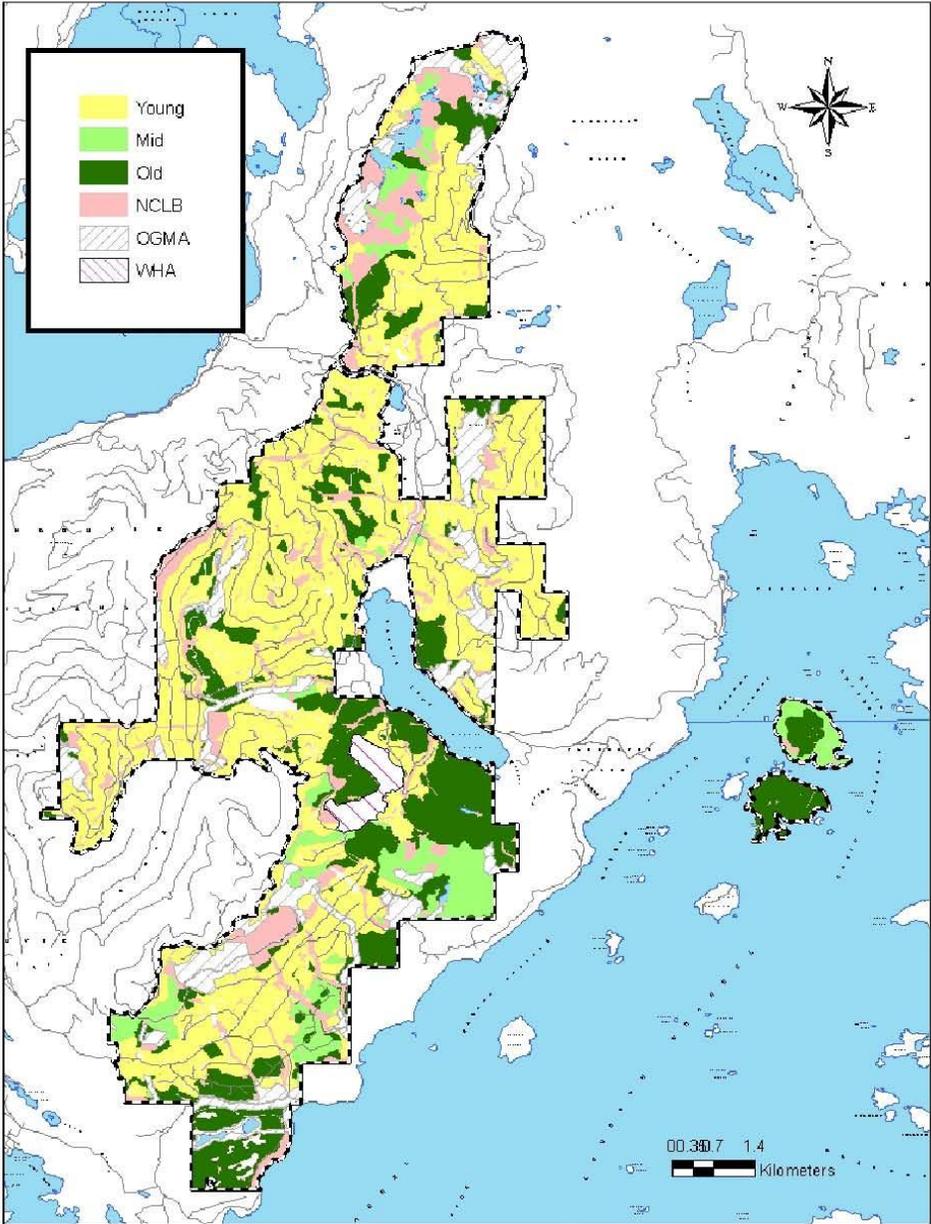


Figure 3. CFA non-THLB areas (NHLB, draft WHA, OGMA) and THLB age classes.

Land Base Assumptions

The timber harvesting land base (THLB) was derived as indicated in Table 4. In many instances, polygons could have been removed by several netdown factors but netdown areas were only attributed one factor to avoid double counting. Areas were always assigned to the netdown reason occurring highest on the list.

Table 4. Timber harvesting land base definition.

Classification	Area (hectares)	Percent of total area	Percent of productive forest area
Gross Area of CFA	6,790	100.0	
Non productive / Existing Roads	-363	5.3	
Total Crown Forest Land Base	6,427	94.7	100.0
Reductions to Crown Forest			
OGMAs	683	10.1	10.6
Riparian Reserves	270	4.0	4.2
Environmentally Sensitive Areas	178	2.6	2.8
Low growing Potential	140	2.1	2.2
Economically Inoperable	30	0.4	0.5
Physically Inoperable	150	2.2	2.3
High recreation value	77	1.1	1.2
Wildlife	97	1.4	1.5
Total productive forest exclusions	1,624	23.9	25.3
Timber Harvesting Land Base	4,803	70.7	74.7

Modeling THLB

For spatial timber supply modeling, polygons must be entirely THLB or Non-THLB so partial netdowns were converted to full netdowns. The total area of THLB remained the same but the spatial location was slightly altered. For this unit, the THLB used for modeling is 0.4 ha smaller than the THLB area on the original files. To arrive at this result, polygons which were largely non-contributing were excluded until the area target was met, while those polygons that are primarily contributing were wholly included. If a break was needed within an inclusion factor class, the smallest polygons were removed until the THLB target was achieved. Depletions were reported to be updated to spring of 2004.

The netdowns applied to the crown productive forest are listed below.

Non Productive Areas

All land classified as non-forested, such as lakes, swamp, rock and alpine, were excluded from the crown forested land base.

Roads Trails and Landings

Existing roads for the plan are in the GIS database for TFL 44 as line features. The area degraded by roads was estimated by applying a buffer of 6.7 meters to either side of the line in the original TFL data set. Similarly in the TSA data existing spatial roads (5 meter buffer on either side) were identified as noncontributing and removed from the land base.

Estimates for future roads, trails and landings are applied after stands are first harvested in the simulation model. Estimates will be applied as a 4 percent volume netdown on future yield curves. This method permits the volume in road right of ways to be captured in first pass harvesting.

Old Growth Management Areas

Spatially explicit draft OGMAs have been identified in the Maggie Lake Landscape Unit and have been used in this analysis. These OGMAs have been netted out of the productive land base and will satisfy old growth retention requirements in this LU.

Riparian Reserve and Management Zones

The netdown assumptions for riparian management areas (reserves and management zones) are based on the TFL 44 MP4 and the TSR2 data sets supplied.

Netdowns are spatial in the TFL data and these values have been carried forward into this analysis.

The TSA average value of 9.0 percent has been carried into this analysis from the TSA data set. This represents a 4.8% reduction for riparian reserve zones and a 4.2% reduction for riparian management zones. TSA polygons were assigned a reduction factor and then the netdown was made spatial as described in 'Modeling THLB' above.

Environmentally Sensitive Areas

Terrain stability mapping for the TFL area uses the 5 class system for mapping terrain stability. Classes I, II, and III are considered stable while class IV is considered potentially unstable and class V is unstable. Based on this classification system terrain stability netdowns were applied as outlined in Table 5. The terrain zones noted are the terrain groupings used by Weyerhaeuser to track their different terrain inventories.

Table 5. Environmentally sensitive area netdowns

Terrain Zone	Partial Netdown (%)		
	Terrain Classification		
	Class I - III	Class IV	Class V
5A	0	20	90
5B	0	20	90

Avalanche run-out zones in the TSA have been mapped as Ea1 areas. A 20% net-down is applied to these areas.

Low Sites

Sites with low timber growing potential, identified in the TSA data set, either because of inherent site factors (nutrient deficiencies, exposure and moisture) or incomplete site occupation by commercial tree species are not part of the THLB and have been removed from consideration.

Economic Operability

Currently uneconomic stands identified in the TFL data have been eliminated from this analysis based on the following economic operability standards used in the management plan analysis (Table 6).

Table 6. TFL Economic operability classification

Stand Type	Conventional (m ³ /ha)		Non-conventional (m ³ /ha)	
	Uneconomic	Marginal	Uneconomic	Marginal
Fir-Cedar	< 278	278-389	< 444	444-556
Hem-Bal	< 333	333-434	< 500	500-611
Hem-Bal-Cyp				
<40% X, Y, Z Grades	< 333	333-444	< 444	444-556
>40% C, Y, Z Grades	< 444	444-556	> 556	556-667
Cedar				
<40% X, Y, Z Grades	< 278	278-389	< 389	389-500
>40% X, Y, Z Grades	< 389	389-500	< 556	556-667

Physically Inoperable

Stands identified in the TSA data set as having physical barriers or limitations to harvesting have netted out of the productive land base using the reduction codes used in the TSR data set.

In the TFL portion of this land base the mature productive forest has been assessed for physical operability and for broad classes of logging methods. The assessment was done in 1993. Three classes have been mapped, specifically:

1. Physically Inoperable Timber
Timber on productive land that is so steep and/or rocky, that it cannot be safely felled or yarded or a significant proportion of the volume could not be recovered.
2. Conventional Harvest Systems
Includes timber on productive, physically operable land that is harvestable by conventional methods, *i.e.*, grapple, high-lead, hoe-chuck, skidder, etc.
3. Non-conventional Harvest Systems
Includes timber on productive, physically operable land that is harvestable only by non-conventional methods. These include helicopter, balloon or long-line cable systems.

Both conventional and non-conventional harvest systems are included in the THLB, while physically inoperable timber was excluded.

Recreation

Recreation areas or recreation features have been addressed on the TFL portion of the landbase following the precedent set by Weyerhaeuser in MP4 and the associated data records (See Table 7).

Table 7. TFL Recreation feature netdowns

Recreation Feature Significance	Recreation Management Class	Netdown (%)
A,B	0	100
A,B	1	50
C	1A	Polygon specific ²

The TSA data set uses a nearly identical netdown strategy for feature significance and recreation management class. The details of the TSA recreation netdowns area tabulated in Table 8

Table 8 TSA Recreation feature netdowns

Recreation Feature Significance	Recreation Management Class	Netdown (%)
A,B	0	100
A,B	1	50
C	1	10 ³

Ungulate Winter Range

There are no ungulate winter ranges in the plan area.

Marbled Murrelets

One (draft) Marbled Murrelet WHA exists in the plan area. This draft WHA area has been netted out of the landbase contributing to timber supply.

² Attempts to "roll over" Weyerhaeuser's recreation inventory to MOF 1998 standards were unsuccessful. Consequently, the netdowns for C1A recreation polygons were visited individually to determine the appropriate netdown. Net downs range from 10 to 100%

³ Reduction percentage applied only to those C1 polygons that do not have a VQO or RVQC

Deciduous Species

The net deciduous area (after reductions for other reasons, such as low sites and riparian) was further reduced by 50% to address poor quality issues arising from deterioration due to age in the Weyerhaeuser management plan assumptions. The net result is that some deciduous area may be retained in the contributing land base as it is expected that there will be a steady market for this hardwood species⁴. In the Barclay CFA plan area there was 1.9 hectares of Alder leading stands. An analysis unit was not developed for this area.

Cultural Heritage Resources

Existing management experience to date suggests that there is little if any additional netdown for culturally modified trees (CMTs)⁵.

Wildlife Tree Retention

Refer to management assumptions section later in this document.

Growth & Yield AssumptionsSite Index

This analysis applies the biophysical and cruise site index values as is described in the TFL 44 information package for Management Plan 4. Specifically "cruised site index is used where a valid cruise had been undertaken (measured age and tree height), generally for stands greater than 31 years and less than 120 years total age".

Yield Model Assignment

Two growth and yield models were used to estimate timber volumes for this Community Forest analysis.

- The variable density yield prediction (VDYP) model developed by the B.C. Ministry of Forests, Resources Inventory Branch, was used for estimating timber volumes for all existing coniferous over 50 yrs old and deciduous stands.
- The table interpolation program for stand yields (TIPSY), developed by the B.C. Ministry of Forests, Research Branch was used to estimate timber volumes for existing and future managed stands as follows. In keeping with TSR 2, all future stands and stands currently less than 50 years old were assigned to a managed stand yield curve.

Utilization Levels

- Net volumes were calculated using a minimum top diameter inside bark (DIB) of 10cm and a maximum stump height of 30cm.
- Stands using the VDYP model will use a 17.5 minimum dbh
- Stands using the TIPSY model will use a 12.5 minimum dbh

Analysis Units

To facilitate modeling of stand growth and expected harvesting and silvicultural treatments, stands are grouped by leading tree species and site productivity; these groups are called analysis units (AUs). The TSR2 analysis unit definitions were used as a starting point to group stands for developing yield curves. As the stands in this community forest are not representative of the stands at the TSA level, new yield curves were developed. Table 9 details how the area in the community forest area was grouped into the TSR2 analysis units. Analysis units suffixed with "EM" describe existing managed stands in the plan area.

The existing unmanaged stand analysis units use old growth site index values. It is reasonable to expect that managed stand site indexes will be higher once all of the area in these analysis units is converted to

⁴ In 2000, Northwest Hardwoods (a subsidiary of Weyerhaeuser) purchased Coast Mountain hardwoods. This has resulted in an increased interest in the supply of alder from tenures in the area, for the alder sawmill in Delta. This expectation of alder supply from the community forest to the Delta sawmill is the basis for retaining some of the deciduous area in the analysis.

⁵ Weyerhaeuser's MP4

managed forest. This increase in site index will in the long term result in higher productivity on these sites than that which was estimated for this modeling exercise.

Table 9. Analysis units and average site index for Existing Stands

AU Name	AU No	Future AU	Area Weighted SI	THLB area
Cedar-G/M	103	203	19.3	572
Cedar-P	104	204	14.8	692
HBS	105	205	23.1	201
Fir - EM	501	501	28.8	1268
Cedar - EM	502	502	19.5	776
HBS - EM	503	503	30.1	1294

Management Assumptions

Minimum Harvest Age

The minimum harvest ages used in this analysis will be consistent with the methodology used in TSR2. The minimum harvestable age for stands in each analysis unit will be set to the greater of:

- The estimated age for the stand to reach the required stand volume;
- The age at which the stand achieves a specified minimum mean diameter at breast height; and
- The age at which the stand achieves 90% of the maximum mean annual increment (MAI)

Table 10. Minimum harvest age criteria⁶

Analysis Unit species	Site Index	Minimum Criteria			MAI (m ³ /ha/year)
		Age (years)	Diameter(cm)	Volume (m ³ /ha)	
All species	All	N/A	25	300	90% of MAI

Harvest Scheduling Priorities

Harvesting will be scheduled to select the relative oldest stands first.

Unsalvaged Losses

Unsalvaged losses due to fire and wind for the Arrowsmith TSA translate to a 0.6 percent loss over the entire TSA based on the figures provided in the September 2001 Timber Supply Area Analysis Report. This amount was modeled as an additional harvest to recognize unsalvaged timber lost as a result of natural disturbances on the THLB each year and is subtracted from all harvest forecasts shown in this report.

Silviculture Systems

All harvesting was modeled as clearcutting. No thinning or partial cutting of stands was modeled.

Silviculture Assumptions

Assumptions for regeneration method, regeneration delay, initial density and species composition can be found below in Table 11. These assumptions are the same as those used in TSR2. Once harvested

⁶ Figures based in the East Division of the Arrowsmith TSA

stands move from their respective natural analysis unit to the corresponding analysis unit described in Table 11.

Table 11. Regeneration assumptions by analysis unit

Analysis unit	AU Number	Regen delay	OAFs		Method		Gain ⁷	Species %				Density	
			1	2	Type	%		Cw	Ba/Bg	Hw	FD	Initial	Final
Cedar — G/M	203	2	15	5	Plant	100	2.7	58	12	30		1200	700
Cedar — P	204	3	15	5	Plant	100	2.7	58	12	30		1200	700
Hemlock/balsam/spruce — ALL	205	2	15	5	Plant	100	1.3	20	10	70		1000	900

Other

There are approved forest development plan blocks within the bounds of the proposed plan area. These blocks have been included in the community forest using current age classes and will contribute volume toward the CFA's AAC. It is assumed that the community forest will likely acquire the rights to these areas as part of the agreements between existing licensees and the provincial government⁸.

Integrated Resource Management

Forest cover requirements stipulating specific seral stage targets are applied in this model to manage for biodiversity, wildlife habitat, scenic values, community watersheds and cutblock adjacency.

Green Up Constraints

As a surrogate for cut block adjacency, a maximum 25% of the THLB in any LU in the CFA may be in stands that are less than 3 meters tall. Site Tools version 3.3 was used to translate this height requirement to an age of 15 years. This represents a total age of 13 years based on a cedar leading stand with a site index of 26.2 meters, and an average regeneration delay of 2 years. This constraint is only applied to the THLB area.

Community Watersheds (CWS)

A very small portion (32.9 hectares) of the CFA falls within TCWS.TAG 930.016 (Toquaht) community watershed. This area is not substantial enough to warrant the application of a TSR style/scale watershed level constraint, doing so would in effect lock out the entire area and prevent it from being included in the modeled harvest profile. Operational scale management decisions will have to consider the overall impact of harvesting in the community watershed in conjunction with others operating in the watershed.

Visual Quality - Scenic Areas

Management for visual quality is consistent with TSR2 standards and limited the area in visual polygons less than 5 meters tall to between 3 and 25 percent depending on the visual quality objective and scenic zone (see Table 14). Site Tools version 3.3 was used to translate the 5 m height requirement to an age of 18 years. This represents a total age of 16 years based on a cedar leading stand with an average site index of 26.2 meters, and an average regen delay of 2 years.

⁷ Using the figures determined in TSR 2, the gains noted will be included in the volume tables for future regenerated stands – figure represents % volume gain at age 80.

⁸ Emma Neill, Tenures Forester, South Island Forest District

Table 12. Visual quality objectives

VQO	Zone	Green-up height (m)	Maximum allowable area not greened-up (%)
R	1	5	3
PR	1	5	10
M	1	5	20
R	2	5	5
PR	2	5	15
M	2	5	25

Landscape Level Biodiversity

Spatially explicit OGMA's for this area were provided by MSRM for the Maggie LU and have been excluded from harvesting during the simulation. These OGMA's satisfy the targets established in the old growth order of June 2004.

Wildlife Tree Retention

Wildlife tree retention will be modeled as a 2.25% volume netdown applied to both existing and future stands in the contributing land base. The rationale for applying 2.25% is that 75% of the gross WTR target⁹ of 9% will be met by forested areas already outside the timber harvesting land base.

⁹ A Weyerhaeuser review of South Island Forest District WTP targets has confirmed that this is appropriate.

Results

Projected Harvest Flow

The results of the timber supply modeling simulations indicates that an initial average harvest level of 27,000 m³ per year for one decade, increasing to 28,000 m³ per year for 6 decades, then increasing to a long term harvest level in decade 8 of 33,000 m³ per year. Figure 4 illustrates the harvest volumes achieved, net of non-recoverable losses, for the 250 year planning horizon. The slight over achievements seen in some decades are a result of the spatial model being forced to harvest whole polygons until the harvest request is met or exceeded.

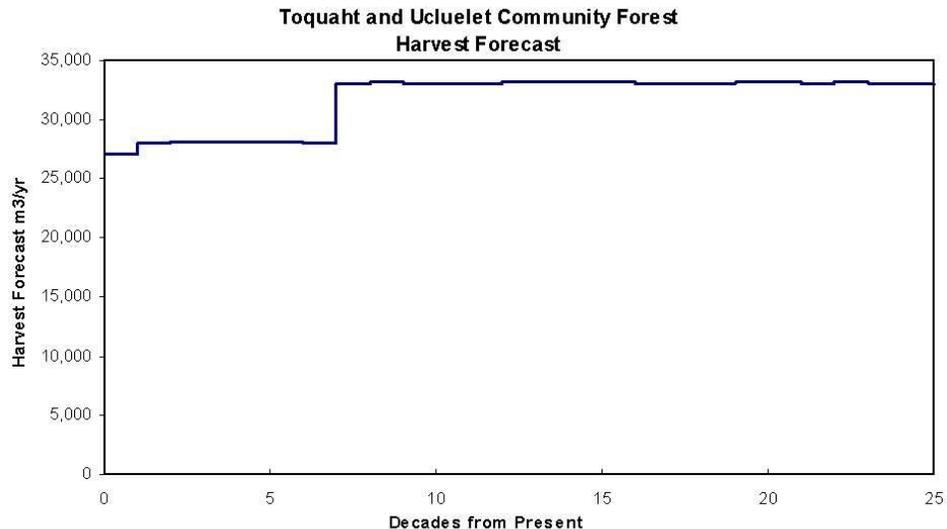


Figure 4. Harvest volumes projected over the 250 year planning horizon

The short term harvest flow for the CFA is heavily dependant on the harvest of the remaining natural stands existing on the land base. The short term harvest availability is constrained by previous harvesting activities. The lack of mature stands in the initial age class distribution prevents a higher short term harvest level.

In the first 20 years the harvest volume as modeled in this analysis is supported by the Good/Medium cedar analysis unit and the Poor cedar analysis unit (Table 13). Low site cedar stands are the predominant harvest in decade 3, falling off in decades 4 and 5, and then do not contribute to the harvest volume again until 13th decade. Managed Fd and HBS stands contribute substantially to the harvest from the 5th decade onward. This occurs due to a large component of these stands aging to the point they meet the minimum harvest age requirements. This performance is consistent with the minimum harvest age requirements associated with this stand type. Opportunity to harvest different species types is limited by the age class distribution of the landbase. Once the age class distribution begins to normalize more harvest opportunity becomes available.

Growing Stock

Figure 5 illustrates the total and merchantable volume of timber occurring on the THLB over the 250 year planning horizon. Total volume is the net volume (considering utilization standards and decay/waste/breakage) of all stands. The merchantable volume is the subset of total volume where

stands meet minimum harvest age criteria. The merchantable stock decreases sharply in the initial decades as the currently merchantable stands are logged and 'replacement' volume in the immature stands is not recognized as merchantable until it meets minimum harvest age criteria.

During the period between the 3rd and 9th decade many of the younger stands that previously did not meet minimum harvest criteria come on line and the growing stock increases steadily. Merchantable growing stock climbs during this period because managed stands are coming online faster than they are being harvested, thus pushing up the harvest average age. Subsequent entries into managed stands are harvested closer to minimum rotation ages which results in lower volumes and reduces the growing stock sitting on the land base.

The generally flat trend in the latter stages of the simulation suggest that harvest rates are close to matching growth rates and a sustainable harvest level is occurring. The peaks in merchantable volume occur when groups of stands simultaneously reach minimum harvest age and push the curve upward. Conversely, harvesting depresses the curve down. The net effect is a dynamic balance. Modeling was performed out to (years=350) to confirm this balance.

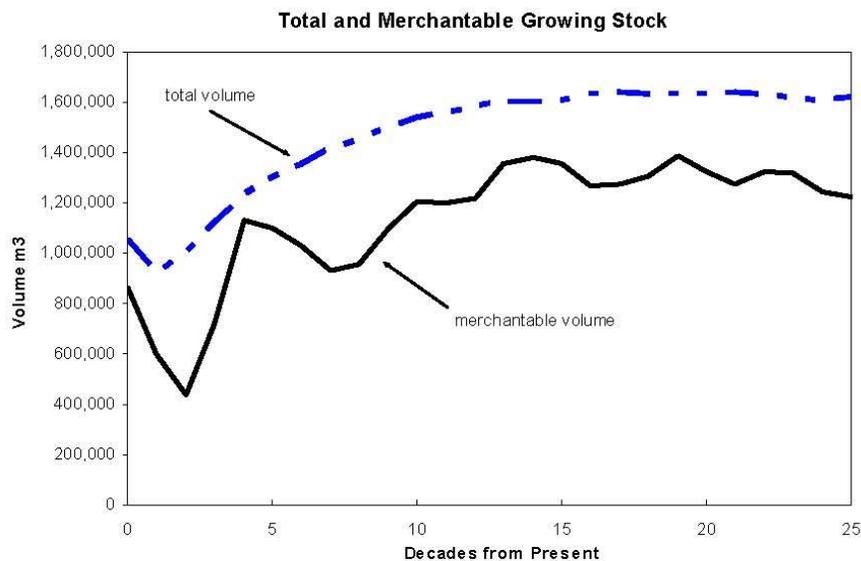


Figure 5. Total and Merchantable growing stock on the THLB

Average Harvest Age

Figure 6 illustrates the average harvest ages over the planning horizon. For the first 2 decades, harvest occurs on unmanaged analysis units which are dominated by old cedar stands with average harvest age of 370 +/- years. In decade 3 managed stands begin to be harvested, and by decade 4 the harvest age average is dominated by second growth stands. Occasional increases occur in instances when persisting unmanaged stands are drawn into the harvest flow or longer rotation poor sites are harvested.

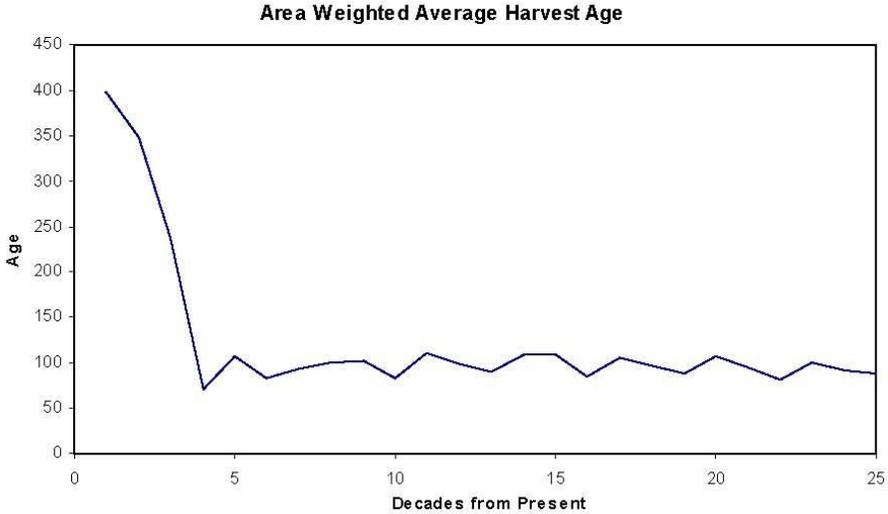


Figure 6. Area Weighted Harvest Age

Natural and Managed Stand Composition

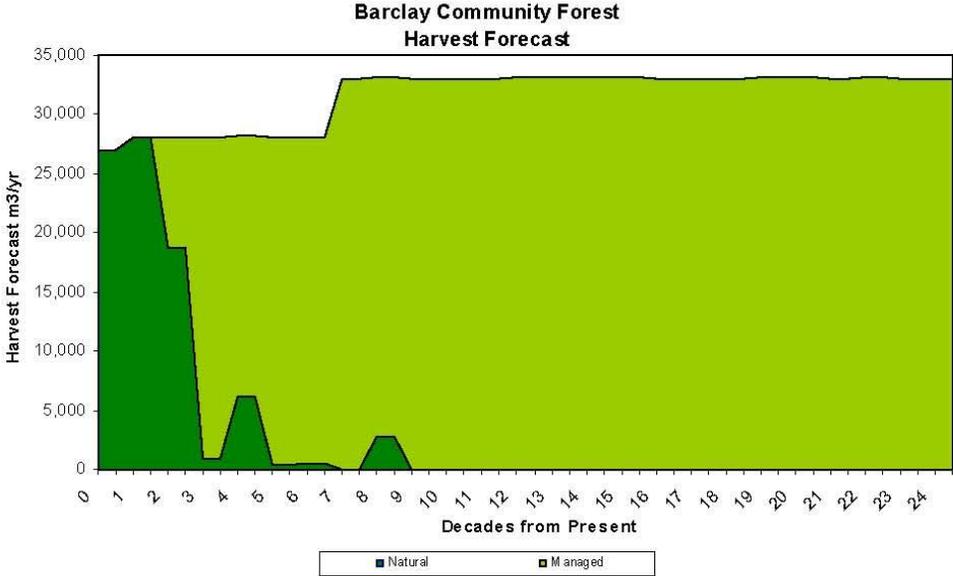


Figure 7. Natural and managed Stand Contributions to Harvest Profile

Figure 7 illustrates the transition from natural to managed stands. Managed stands are first harvested in decade 3. They form the bulk of the harvest profile from decade 4 onwards.

Average Harvest Volume

Figure 8 illustrates the average harvest volume per hectare realized in each decade of the simulation. Fluctuations in different periods of the simulation correspond with the harvest of stands with different site productivity characteristics. In periods where low productivity sites are drawn into the average, the average declines. The higher peaks occurring in the latter stages of the simulation are due to the higher volumes associated with managed stands compared to unmanaged stands. During the first 50 years, the average volume per hectare is 617 m³/ha. The average value is 726 m³/ha for each of the next two 100 year periods.

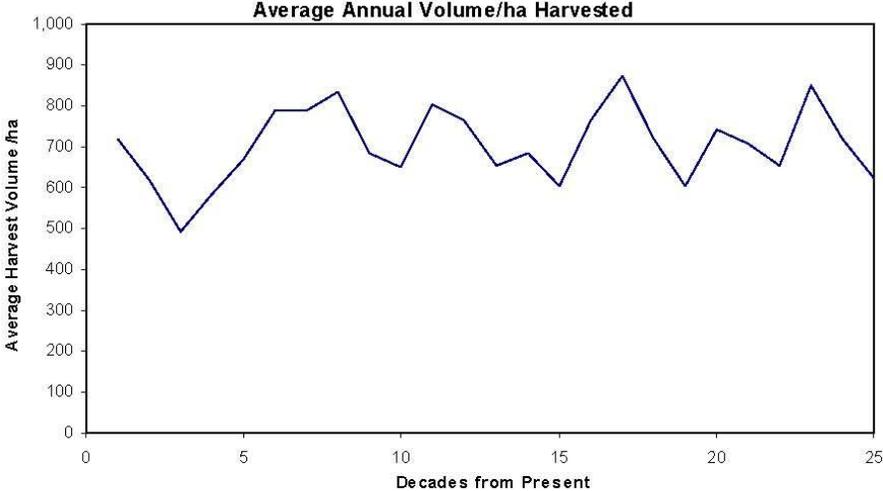


Figure 8. Average Annual Volume/ha Harvested

Average Annual Harvest Area

The average annual harvest area exhibits an inverse relationship with the harvest volume per hectare. As the volume per hectare increases fewer hectares are required to fulfill the harvest objective, and vice versa. Figure 9 illustrates the average annual harvest area as it fluctuates over time. During the first 50 years the average area harvested is 462 ha, (corresponding with the above figures). The next 100 year average area harvested is 451 ha and for the balance of the planning horizon the value is 465 ha.

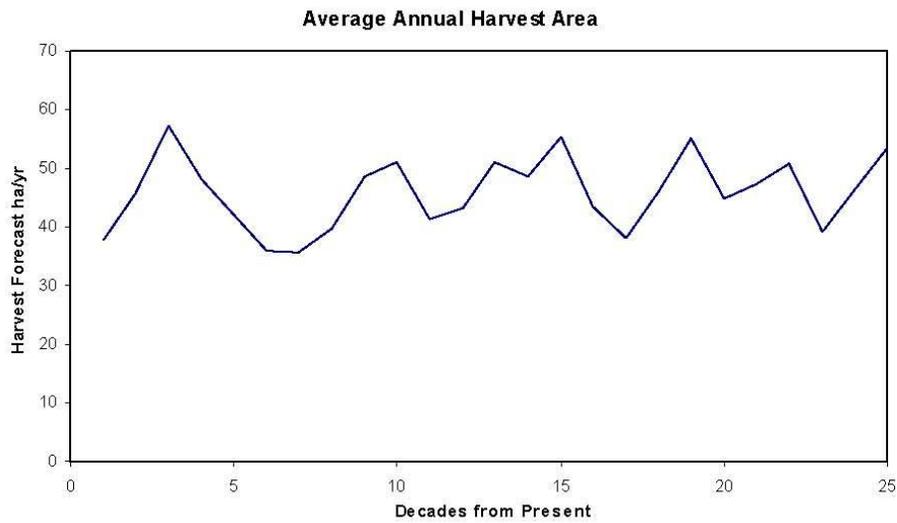


Figure 9. Average Annual Harvest Area

Age Class Distribution

Figure 10 illustrates 50 year time steps of the age class distribution as it occurs over the 250 planning horizon. The present condition (year 0) shows a significant polarization into young and old seral stands. As harvesting occurs the area becomes more evenly distributed below typical harvest ages (120 years). A small amount of THLB area exists in older ages because forest cover constraints force them to remain unharvested.

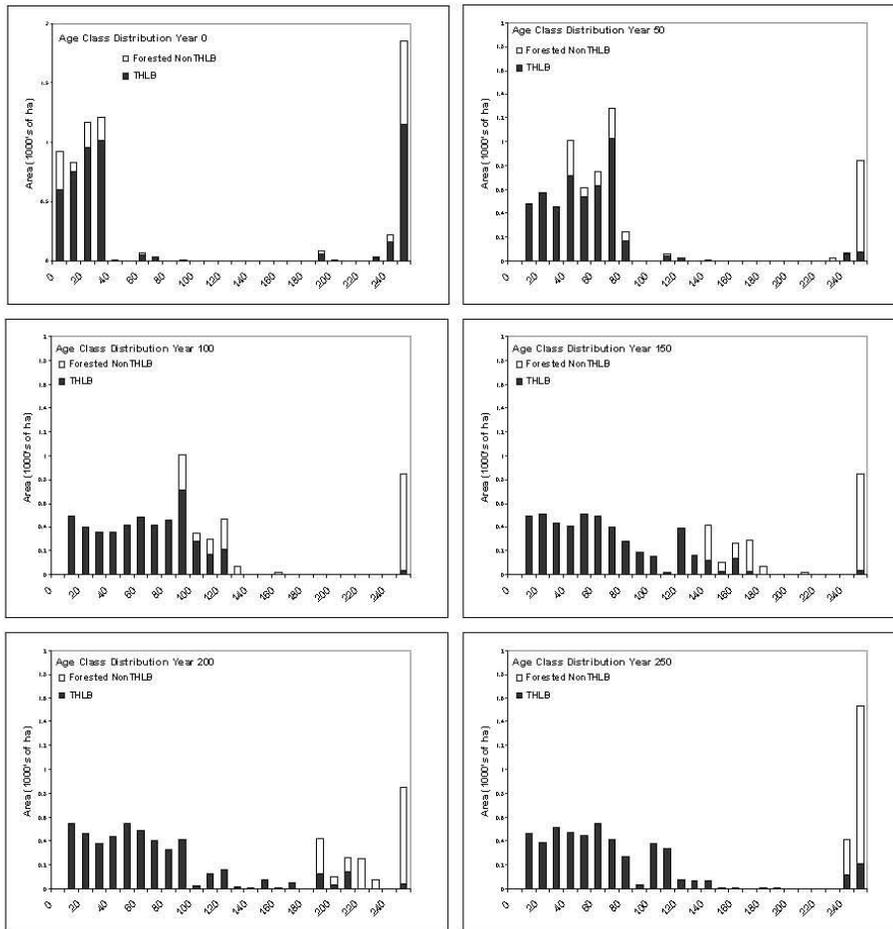


Figure 10. Age Class Composition over Time in the Barclay Community Forest

The NHLB (forested area outside the THLB) continues to age over the planning horizon and by the end of the planning horizon all the NHLB is old.

Constraint Analysis

There are several constraints applied to the contributing land base to address forest management issues and objectives. These management objectives limit disturbance or maintain appropriate levels of specified forest types that are required to satisfy visual quality, biodiversity and other attributes at

specified levels. Old seral requirements were met using spatial OGMA that were netted out of the THLB. The area affected by each of these constraints is illustrated in Figure 11.

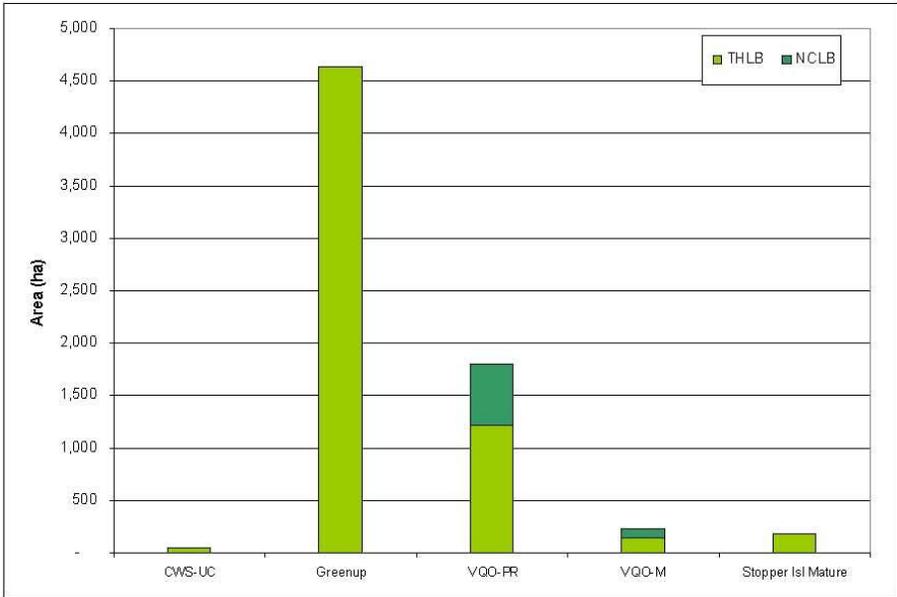


Figure 11. Integrated Resource Values: Area Summary by Objective

Both young and older seral constraints were applied to the CFA area. At the start of the simulation (decade=0; year=0) the IRM constraint was the predominant constraint (Figure 12). Immediately in the first decade, due to the aging of stands, the area of IRM constraint dropped and from decade 1 onwards the VQO constraints are the major constraining factor to harvest. However, these are only active on a portion of the landbase. The "Mature" constraint category is the Stopper Island older seral constraint, which comes into play at add hoc periods. In general, the VQO constraints are the only constraint which limits harvest opportunity, but these are active on only a portion of the landscape. Conversely, the availability of mature stands in the short-term, and the growth of new stands in the mid- and long-term are the critical, limiting factors to the harvest level within the CFA.

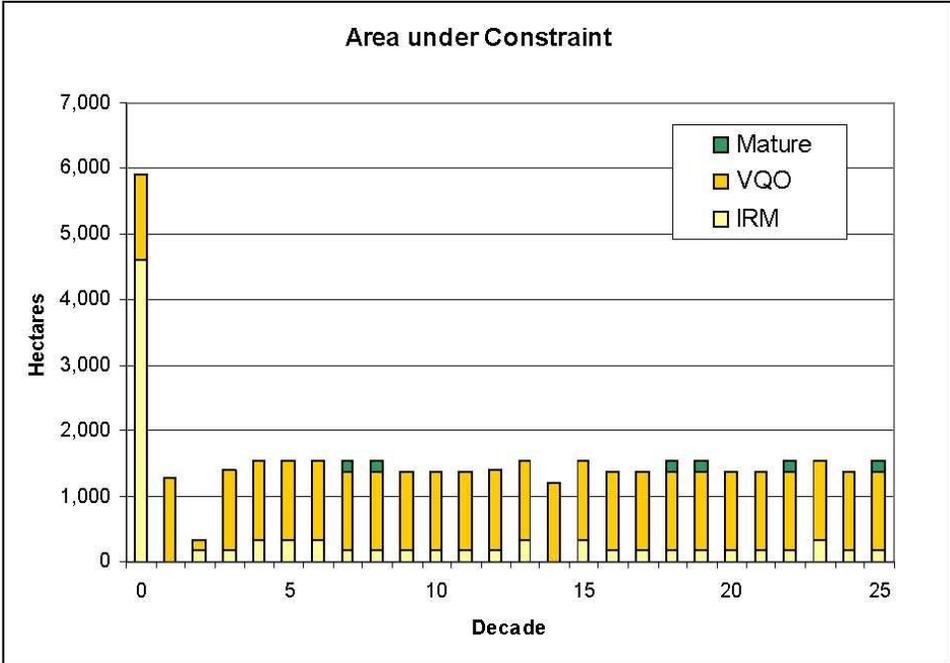


Figure 12 CFA area under constraint.

Contribution of Helicopter Wood

Annualized helicopter harvest contribution is a very small portion of the harvest, and varies between 0 and 1,894 m³/decade (not year). Averaged out over the planning horizon the helicopter volume amounts to 537 m³/decade. Figure 13 illustrates the helicopter harvest performance during the planning horizon. This figure represents one of many solutions and should not be considered an operational certainty. As harvest opportunity increases during the planning horizon there will be much greater opportunity to consolidate helicopter harvest into more efficient harvests.

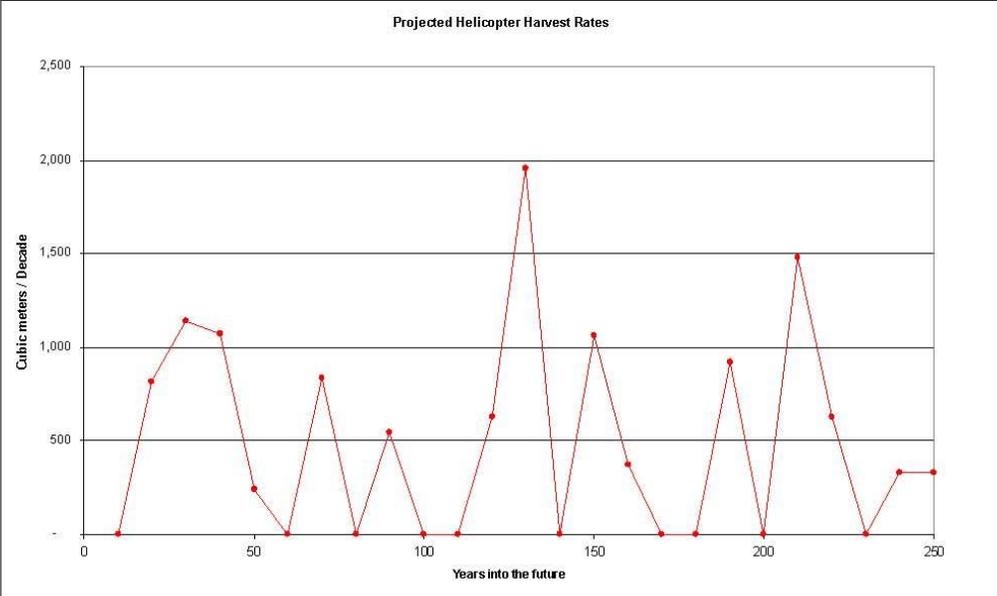


Figure 13 Projected Helicopter Harvest Rates

Short Term Harvest Availability

This report presents an initial short term (20 year) harvest flow of 27,000 and 28,000 m³/year for the first and second decades, respectively.

Harvest availability is initially limited with 63% of the THLB area less than 41 years old; however, the minimum harvest ages for many sites in this CFA are quite low and there is considerable mature forest to draw upon. The long term harvest level is not reached for several decades because the initial age class distribution requires considerable time to normalize. Once the distribution between age classes normalizes the long term harvest level is attainable.

Table 13 details harvest volumes by analysis unit during the first 100 years of the planning horizon. Cedar analysis units dominate the early harvest profile which is to be expected considering the species composition of mature stands in the CFA.

In this simulation an oldest first harvest rule was applied and the conversion of unmanaged stands to managed stands is essentially complete in the 4th decade. Cedar harvest is substantial in most periods, except for the 4th to 7th periods when Fd dominates. Note these analysis units are based on leading species. Other species can be expected as lesser components of these stands. Operational reality may differ substantially from these results as the model was not calibrated to focus on a particular species.

Table 13. Analysis unit volume summary

Analysis Unit	Avg Harvest Volume/yr by Period									
	Yr 1-10	Yr 11-20	Yr 21-30	Yr 31-40	Yr 41-50	Yr 51-60	Yr 61-70	Yr 71-80	Yr 81-90	Yr 91-100
Cedar – GM	23,029	13,784	2,533	161	325	388	531	-	2,884	-
Cedar – P	2,086	9,472	16,143	503	1,527	-	-	-	-	-
HBS – All	2,094	4,919	130	325	4,375	-	-	-	-	-
HBS EM	-	-	9,447	15,001	13,751	16,376	8,335	9,676	13,227	15,993
Fd EM	-	-	-	12,232	8,335	11,438	19,296	19,958	4,963	2,220
Cedar - EM	-	-	-	-	-	-	-	3,610	12,222	14,971
Cedar – GM (F)	-	-	-	-	-	-	-	-	-	-
HBS – All (F)	-	-	-	-	-	-	-	-	-	-
Cedar – P (F)	-	-	-	-	-	-	-	-	-	-
Total	27,209	28,175	28,253	28,222	28,314	28,202	28,162	33,244	33,296	33,184

(F) Future managed stand analysis units

Figures are gross, non recoverable losses have not been removed.