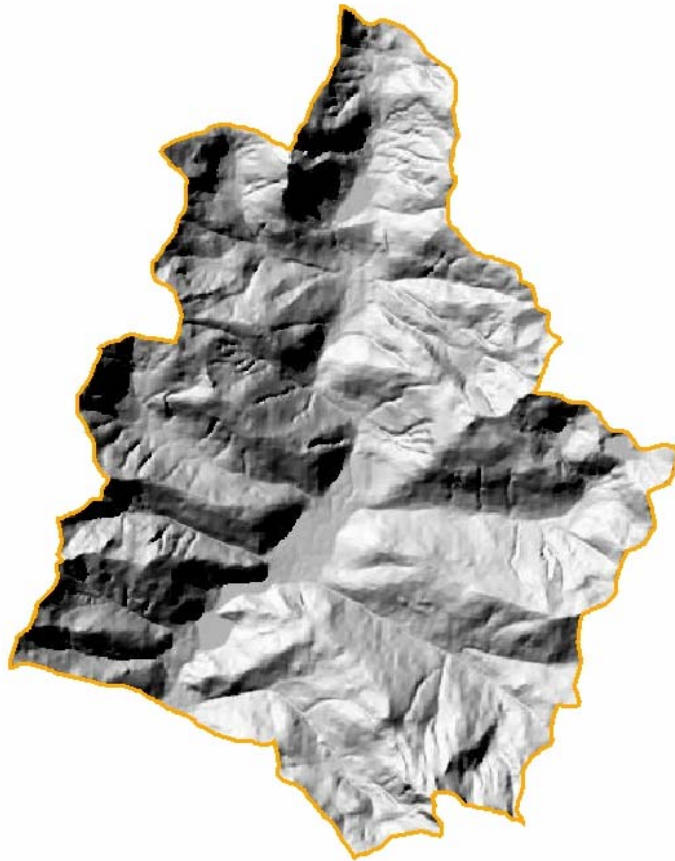


WATERSHED PLANNING IN CLAYOQUOT SOUND

VOLUME 8: CLAYOQUOT RIVER WATERSHED PLAN



CLAYOQUOT SOUND TECHNICAL PLANNING COMMITTEE

July 2006



**Central Region Chiefs
Administration**

Box 790, Ucluelet, B.C. V0R 3A0

July 10, 2006

Guy Louie and Jim Lornie, Co-Chairs
Clayoquot Sound Central Region Board
Post Office Box 790
100 Hittatsoo Road
Ucluelet, BC V0R 3A0

Dear Guy Louie and Jim Lornie:

**Re: Watershed Plan Endorsement for the Tofino - Tranquil (Onadsilth - Eekseuklis),
Sydney - Pretty Girl, Bedwell - Ursus - Bulson, Hesquiaht, Kennedy Lake, Upper
Kennedy River, Clayoquot River, and Fortune Channel planning units.**

On behalf of the Parties to the Clayoquot Sound Interim Measures Extension Agreement, and as recommended by the Central Region Board (CRB) in two letters to the Parties during 2005, we are pleased to endorse the watershed plans for the above watershed planning units.

The Board made several significant recommendations in both their letters, including: specific recommendations about individual plans involving technical content; that a summary plan document be completed to provide a regional synopsis of watershed reserves and other Scientific Panel objectives; that a Beach watershed plan be completed and incorporated into the summary document; and, that legal objectives be established under the *Forest and Range Practices Act*.

We understand the Clayoquot Sound Technical Planning Committee (TPC) has undertaken the following initiatives with regard to those recommendations:

- completion of technical changes for individual plans;
- begun work on a regional summary document, including incorporation of Scientific Panel objectives for the Beach planning unit; and,
- initiated inter-agency discussions with regard to setting legal objectives under the *Forest and Range Practices Act*.

We also understand that following the second public review period and during preliminary work on the regional summary document, the Planning Committee found a small number of minor errors and discrepancies in the GIS analyses results. The Committee determined that these, as well as other inconsistencies between watershed plans, could be addressed without making significant revisions to the watershed plans or the reserve networks. Therefore, they

have incorporated the necessary corrections and changes into the final versions of the watershed plans and the regional summary document.

The Parties are pleased to confirm our support for the CRB recommendations and the efforts by the Planning Committee to address them. We have instructed the TPC to ensure all changes and updates are completed, so that individual watershed plans are ready for public distribution by July 31, 2006. At that time, the plans will take effect as 'Official Watershed Plans'.

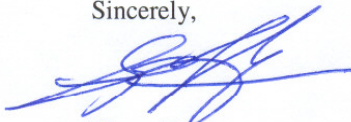
The Board made one other significant recommendation in its two letters: that the Parties identify the resources to develop and implement a comprehensive monitoring program. Now that the watershed planning process is drawing to a close, the Parties are pleased to announce we have begun discussions regarding the availability of resources that will allow for the evaluation of outstanding priorities, including the details associated with plan implementation and monitoring. The Parties recognize that these priorities are important steps on the road to sustainable ecosystem management, as envisioned by the Scientific Panel, and are crucial components to the practice of adaptive management. We anticipate our discussions will yield direction on these topics to the Board and the Planning Committee in the near future.

We wish to acknowledge the considerable work required of the CRB to conduct two public reviews of the draft watershed plans during 2005. We especially appreciate the Board's efforts to organize and summarize the results from the public processes and its own reviews, then to structure its subsequent recommendations in order to provide assistance to the Parties' review and evaluation of these plans.

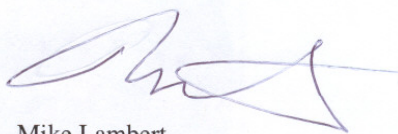
Further, we would like to thank the CRB, the Central Region First Nations, various stakeholders and interest groups, local governments, and members of the public for their contributions to the development of these plans - and, for their thoughtful comments during each review process.

We look forward to a continued close working relationship between the Parties, the Central Region Board, and the Technical Planning Committee to achieve the objectives envisioned by the Scientific Panel. Continued close cooperation between all partners will be instrumental in achieving this goal.

Sincerely,



Elmer Frank
Chairman
Central Region Chiefs



Mike Lambert
Associate Deputy Minister
Integrated Land Management Bureau

cc. Nelson Keitlah and Rudi Mayser, Co-chairs, Clayoquot Sound Technical Planning Committee

Preface

This watershed plan for the Clayoquot River planning unit was prepared by the Clayoquot Sound Technical Planning Committee (TPC). Committee membership consists of representatives from the First Nations of Clayoquot Sound and technical staff from provincial agencies. The TPC is co-chaired by one representative each from First Nations and the Integrated Land Management Bureau (ILMB), of the Ministry of Agriculture and Lands¹. A complete membership list is provided in Appendix 1.

The primary responsibility of the TPC is to complete watershed-level planning for Clayoquot Sound. Watershed plans are compiled in a series of volumes. *Volume 1: Principles and Process* describes the planning process and objectives for the Sound (for planning purposes the boundaries of the Sound are defined as those established in the Clayoquot Sound Land Use Decision, included as Map 1). The remaining volumes, including this document, summarize the results for individual watershed planning units.

In preparing this plan, the TPC followed the recommendations of the Scientific Panel for Sustainable Forest Practices in Clayoquot Sound for watershed-level planning and identification of reserves. At times the TPC also sought additional advice from respected specialists in their field of expertise.

The intent of this watershed plan is to guide site-level forest planning and forest harvesting in the Clayoquot River watershed planning unit, in accordance with the Scientific Panel recommendations for sustainable ecosystem management in Clayoquot Sound.

The effective date of this plan is July 31, 2006. This plan will be subject to periodic updates and amendments to keep it current and to reflect new information.

¹ When the TPC was first established, government representatives included staff from the Ministry of Forests, the Ministry of Environment, Lands and Parks and the Ministry of Small Business, Tourism and Culture. In 2001, responsibility for resource management was transferred to the new Ministry of Sustainable Resource Management (MSRM). In 2005, the MSRM was dissolved and a new agency (Integrated Land Management Bureau, Ministry of Agriculture and Lands) assumed responsibility for land use planning.

Table of Contents

Executive Summary	
Development of the Plan	1
The Clayoquot River Watershed Reserve Network	2
Watershed Integrity	2
Biological Diversity	2
Human Values	3
Summary	4
The Clayoquot River Harvestable Area	4
Amendments, Implementation and Monitoring	5
1.0 The Clayoquot River Planning Unit	
1.1 The Physical Landscape	7
1.2 The Ecological Landscape	8
1.3 Human Values	9
2.0 The Clayoquot River Reserve Network	
2.1 Reserves to Protect Watershed Integrity	11
2.1.1 Hydroriparian reserves	11
2.1.2 Sensitive soils and unstable terrain reserves	11
2.2 Reserves to Protect Biological Diversity	12
2.2.1 Reserves to protect red- and blue-listed species	12
2.2.2 Reserves to protect forest-interior conditions in mature forests	14
2.2.3 Reserves to represent all ecosystems	15
2.2.4 Reserves to ensure linkages between watershed planning areas	16
2.3 Reserves to Protect Human Values	17
2.3.1 Culturally Important Areas to protect First Nations values	17
2.3.2 Protection of scenic values	20
2.3.3 Reserves to protect recreation and tourism values	21
2.4 Summary: The Clayoquot River Watershed Reserve Network	24

Table of Contents (continued)

3.0 Sustainable Ecosystem Management in the Clayoquot River Watershed Planning Unit

3.1 Management Criteria for Special Management Zones	25
3.2 Management Criteria for Sensitive Sites	27
3.3 Silviculture, Harvesting and Transportation Systems	28
3.4 Rate-of-Cut	28
3.5 Restoration	29
3.6 Summary: Harvestable Area in the Clayoquot River Watershed Planning Unit	32

Appendix 1: Clayoquot Sound Technical Planning Committee

Appendix 2: Red- and Blue-Listed Plant Communities in Clayoquot Sound

List of Maps

Executive Summary

This watershed plan encompasses the entire Clayoquot River watershed planning unit. This planning unit covers 7,738 hectares and is bounded to the west by the Tofino - Tranquil Planning Unit, to the east and north by the upper Kennedy River and its headwaters, and to the south by the Kennedy Lake Planning Unit.

This watershed plan was developed in accordance with the principles and recommendations set out by the Scientific Panel on Sustainable Forest Practices in Clayoquot Sound to guide planning for sustainable ecosystem management in Clayoquot Sound. This plan does not apply to provincial parks, Indian Reserves, federal lands, or private land.

The purpose of the plan is to map and designate the areas that will be set aside as reserves to protect a range of forest values. The plan also maps and designates the harvestable area – that is, the land that falls outside of reserves and on which sustainable forest harvesting can take place. Within the harvestable area, special management zones are identified. In these areas, certain conditions and limitations are imposed on harvesting and other management activities in order to maintain special and sensitive values including scenic, recreation, tourism and ecosystem values.

Development of the Plan

The Scientific Panel (SP) identifies three key ecosystem management planning themes: watershed integrity, biological diversity, and human values including First Nations cultural values. The Panel sets out management goals and objectives for each of these three themes. Overall, this framework forms the backdrop to a planning process that includes broad-based regional and sub-regional plans, watershed-level plans, and site-specific plans.

The Scientific Panel identifies watershed-level planning as the cornerstone to the overall ecosystem-based management planning process. Watershed-level plans give practical meaning to ecosystem management goals and objectives, and also guide the site-level plans that direct forestry activities. Within watershed-level plans, the designation of reserves and special management zones is the key strategy for achieving the ecosystem management objectives articulated by the Scientific Panel. In the harvestable area, a variable retention

silviculture system, rate-of-cut limits and various restoration strategies provide a site-level complement to ecosystem management.

This watershed plan for the Clayoquot River watershed planning unit was developed by a Technical Planning Committee (TPC) made up of First Nations representatives and technical staff from provincial agencies, led by the Integrated Land Management Bureau. The TPC relied on the Scientific Panel reports and recommendations, as well as other expert advice, to develop the criteria for establishing reserves and special management zones.

The Clayoquot River Watershed Reserve Network

The Scientific Panel proposes eight different kinds of reserves to protect forest values. Each of these reserve types serves as a strategy to achieve management objectives within one of the key management themes, as described below. Accompanying maps show the location of individual reserves.

Watershed Integrity

Reserves to protect hydroriparian resources

Approximately 1,890 hectares have been designated as hydroriparian reserves. This represents approximately 24 percent of the total land base of the Clayoquot River watershed planning unit (see Map 7).

Reserves to protect sensitive soils and unstable terrain

Unstable terrain reserves (areas of Class V terrain) cover approximately 361 hectares, or 5 percent of the planning unit. Reserves for sensitive soils cover 1,193 ha or 15 percent of the land base. There is a small amount of overlap between these two layers in this planning unit, but considerable overlap with other reserves at several locations. Together, unstable terrain reserves and sensitive soils reserves make up 1,536 ha or 20 percent of the total land base of the Clayoquot River watershed planning unit (see Maps 8 and 9).

Biological Diversity

Reserves to protect red- and blue-listed plant and animal species

Approximately 1,060 hectares have been set aside in seven separate Marbled Murrelet reserves within the Clayoquot River watershed planning unit. Approximately 52 percent of this area (568 ha) was already reserved for other purposes. These reserves, in combination with other reserves and protected areas, protect approximately 2,305 ha of class 1 and 2 Marbled Murrelet nesting habitat in this planning unit.

This amounts to 60 percent of the total class 1 and 2 habitat available, or 30 percent of the land base (see Map 11).

Approximately 145 ha, or 2 percent of the land base of the Clayoquot River watershed planning unit, have been designated as reserves for the protection of red- and blue-listed plant communities (see Map 10).

Reserves to protect forest-interior conditions in late successional forest

Currently, there are approximately 6,043 ha of old forest within the Clayoquot River watershed planning unit. This represents 78 percent of the planning unit, and 87 percent of the total forested land base. Of this, the reserve network encompasses approximately 3,600 ha, or 52 percent of the forested land base. This exceeds the SP recommendation for a minimum old growth retention of 40 percent. Map 12 shows the current old-growth forest and forest in interior conditions.

Within the reserve network, 1,856 ha are classed as forest-interior condition. This fully meets the old-interior forest recommendations of the Science Panel (see Map 13).

Reserves to represent all ecosystems

After the reserve network had been completed, the Committee found that 13.5 ha had to be added to the reserve network to satisfy ecosystem representation requirements (see Map 14).

Reserves to ensure linkages among watershed-level planning areas

Once watershed-level plans are completed for a number of adjacent watershed planning units in Clayoquot Sound, opportunities for linkage corridors will be evaluated. Where necessary, reserves that create linkages needed to support biodiversity or recreation objectives will be added to the reserve network.

Human Values

Many of the areas designated to protect culturally significant sites, scenic areas and recreational or tourism values are better characterized as special management zones than as reserves. Most of these areas are not excluded from harvesting; however, certain conditions and requirements must be met before harvesting may proceed. Only reserve buffers around recreational and tourism features, certain cultural sites and scenic features – to the extent they are located within parks or reserves for other values – are excluded from harvesting.

Reserves to protect cultural values

Approximately 4,208 ha, or 54 percent of the Clayoquot River watershed planning unit, has been identified by the Tla-o-qui-aht First Nations (TFN) as areas of cultural significance. For reasons of confidentiality, the cultural values map included in this report (Map 15) shows only the general locations of sites of cultural importance.

Reserves to protect scenic and recreation/ tourism values

Reserves have not been established for scenic values, although many areas of high significance for scenic values have been preserved within existing parks and reserves for other values. Scenic values within the harvestable area are maintained through management criteria designed to achieve scenic class objectives and standards.

In total, 1,661 ha, or 21 percent of the lands within the Clayoquot River watershed planning unit, have been assigned scenic class objectives: approximately 14 ha to the natural-appearing scenic class objective, 1,548 ha within the minimal alteration class, and 99 ha within the small-scale alteration class. The remaining landscape is not classified because it is generally not visible from communities, recreation sites, and travel corridors. Of the scenic class areas, approximately 1,105 ha (67 percent) are included within parks and reserves (see Map 16).

In addition to areas that are assigned scenic class objectives and areas within other kinds of reserves, approximately 57 ha containing features of high to very high recreation and tourism significance have been reserved, primarily around lakes. This represents less than 1 percent of the land base of this planning unit. Areas surrounding recreation and tourism reserves have been identified as special management zones (see Map 17).

Summary

Approximately 5,025 ha, representing 65 percent of the land base of the Clayoquot River watershed planning unit, have been reserved from harvesting in accordance with the recommendations of the Scientific Panel. Map 18 shows the complete watershed reserve network.

The Clayoquot River Harvestable Area

Once all the watershed reserve areas are mapped, the remaining area outside reserves is designated as the harvestable area. Forest harvesting and related development such as road-building can take place within the harvestable area as long as this development is consistent with the Scientific Panel recommendations relating to operations, the *Forest*

Practices Code Act, the *Forest and Range Practices Act*, and the watershed plan. All forest harvesting will take place in accordance with the Variable Retention Silvicultural System designed to preserve the characteristics of natural forests.

Within the harvestable area, special management zones have been identified where additional conditions and limits are imposed on forest harvesting and other operational activities. These conditions and limits ensure that the special and sensitive values in these areas – including scenic, recreation, tourism and ecosystem values -- are maintained. Map 20 shows the location of the harvestable area, including Special Management Zones, as well as the reserve network.

The harvestable area within the Clayoquot River planning unit encompasses 2,580 ha of the productive forest, representing 33 percent of the planning unit, or 37 percent of the forested land base. Special management zones comprise 1,233 ha (48 percent) of the harvestable area.

Forest management within harvestable areas is also subject to hydrological rate-of-cut limits, in accordance with Scientific Panel recommendation R3.1. Rate-of-cut limits applicable to watersheds within this planning unit are set out in Chapter 3. Map 21 shows the locations of these watersheds.

Harvesting systems will be determined at the site level in accordance with watershed-level objectives. The selection of systems and their application will be consistent with the recommendations set out by the Scientific Panel with respect to harvesting methods and equipment.

Amendments, Implementation and Monitoring

The plan will be subject to minor updates, as well as major scheduled and unscheduled amendments, as outlined in Volume 1, Chapter 4. Implementation and monitoring of the plan will be the joint responsibility of provincial resource agencies, First Nations, forest tenure holders and partners who share the common goal of sustainable ecosystem management in Clayoquot Sound, as discussed in Volume 1, Chapter 5.

1.0 The Clayoquot River Planning Unit

1.1 The Physical Landscape

The Clayoquot River watershed planning unit is located in the south-eastern section of the Clayoquot Sound Land Use Decision area. The planning unit is bounded to the west by the Tofino Creek drainage basin within the Tofino - Tranquil Watershed Planning Unit, to the east and north by the upper Kennedy River and its headwaters, and to the south by the Kennedy Lake Planning Unit.

The Clayoquot River planning unit boundaries coincide with the entire area covered by the Clayoquot River drainage basin (7,738 hectares), extending from the mouth of the river to the top of all headwater tributaries and surrounding heights of land. Map 2 shows the location of the planning unit within the Land Use Decision area.

The Clayoquot River is the only watershed in this planning unit. It flows in a general south and southwest direction, draining into Kennedy Lake at the north end of Clayoquot Arm. There are five lakes on the mainstem: Clayoquot Lake, 1.5 kilometres from the mouth, covers 45 hectares; Norgar Lake, 7.7 kms upstream from Clayoquot Lake, covers 19 hectares; and, above 550m elevation, there is a series of three unnamed lakes (sometimes referred to as Murrelet Lakes) ranging in size from 2.5 to 4.1 ha. There are two unnamed lakes near Steamboat Mountain, at the headwater of the largest tributary to the Clayoquot River (Tributary 500): one covers 5.9 ha, the larger 13 ha.

Most of the Clayoquot Sound landscape was modified by glaciers during the Pleistocene period, and features and landmarks in the planning unit, such as U-shaped valleys, bear witness to this. One of the provincial parks in this planning unit, Clayoquot Plateau, protects an extensive area of high elevation karst, cave and sinkhole features.

Elevations within the planning unit range from approximately 6.0 metres above sea level, at the Clayoquot River mouth, to about 1,480 metres, at Steamboat Mountain on the planning unit's eastern boundary. Map 3 illustrates the topographic relief for this unit.

The climate in this area, as throughout the west coast of Vancouver Island, is temperate and very wet. Annual precipitation near sea level exceeds 3,000 mm, and is much greater at higher elevations inland. As a result of high amounts of winter precipitation, snow cover lingers very late into the season at higher elevations. This is one of the few Clayoquot Sound planning units not directly influenced by the marine

environment. As a result, mean daily temperatures are generally lower than in other planning units during winter, and higher during summer.

1.2 The Ecological Landscape

Approximately 90 percent of the Clayoquot River watershed planning unit supports forests dominated by western redcedar, western hemlock, mountain hemlock, yellow-cedar, Sitka spruce and amabilis fir.

Two biogeoclimatic ecosystem classification (BEC) zones occur in the Clayoquot River watershed planning unit: the Coastal Western Hemlock (CWH) and the Mountain Hemlock (MH). The CWH zone occupies over 70 percent of the planning unit and is represented by two variants. The CWHvm1 variant (Submontane Very Wet Maritime) occurs below 600 meters elevation, and covers approximately 48 percent of the planning unit. The CWHvm2 variant (Montane Very Wet Maritime), located on upper slopes at elevations between 600 and 800 m., covers approximately 22 percent. The MH biogeoclimatic zone is characterized by one variant and one sub-variant. The MHmm1 variant (Windward Moist Maritime) occupies 27 percent of the planning unit, at elevations of 900 meters and above. The MHmmp1 (Moist Maritime Parkland MH) sub-variant occurs above 1,200m, and occupies 3 percent of the planning unit. Refer to Map 4 for BEC variant locations.

50 different ecosystems are represented in the Clayoquot River watershed planning unit.

50 different vegetated ecosystem types are represented within the Clayoquot River planning unit. The most common ecosystems are Western Hemlock/ Amabilis Fir - Blueberry (AB), which occupies over 43 percent of the planning unit, and Mountain Hemlock/ Amabilis Fir - Blueberry (MB), at 14 percent.

Approximately 87 percent of the Clayoquot River forested land base supports ecosystems that are over 140 years old. There has been no harvesting except for 45.5 ha (0.6 % of the planning unit) logged in 1972.² Map 5 shows the location and age distribution of forest stands.

This planning unit contains nesting habitat for the Marbled Murrelet, a red-listed bird species. Studies indicate a direct correlation between Marbled Murrelet nesting habitat suitability and old growth forests. Since there has been limited development within this planning unit, impact on nesting habitat is expected to be minimal.

The Clayoquot River system supports Rainbow Trout, resident Cutthroat Trout, anadromous Cutthroat Trout, Chum, Chinook, Coho, Sockeye, Steelhead, Dolly Varden Char, Peamouth Chub, Prickly

² Johannes, M and J. Cleland. 1999. *Kennedy Watershed Atlas series – Volume II: Clayoquot Valley Natural History*. Northwest Ecosystem Institute, Lantzville, BC.

Sculpin, River Lamprey, Threespine Stickleback and coastal sculpin species.³ Johannes *et al.* (1999) confirm Chum spawning in the lower end of the mainstem and Sockeye, Coho, Chinook, Steelhead, Cutthroat and Dolly Varden spawning below and above Clayoquot Lake. This watershed also provides rearing and overwintering habitat for these species. Both Coho and Steelhead have been recorded above cascades 3.5kms from the Clayoquot River mouth.⁴ The presence of several species of concern (cutthroat, Dolly Varden, Sockeye, Peamouth Chub) indicates that this watershed has high biodiversity values.

Black Bears are common throughout Clayoquot Sound. Since there has been very little development in this planning unit, bear foraging and denning opportunities have not been altered.

Similarly, forage and winter habitat for ungulates, including Black-tailed Deer and Roosevelt Elk, remain unaltered within this planning unit. Population numbers for both species are unavailable but are expected to be low. Wilcon (1997) did not find any sign for either species, but noted two historical records for elk. At the watershed level, the hydriparian reserve network plus the large area covered by the provincial parks offer valuable valley bottom and south-facing winter habitat for elk and deer, respectively. At the stand level, high retention levels, rate-of-cut restrictions, and minimum old growth requirements are expected to ensure maintenance of critical winter habitat and security cover, while contributing to increased forage production.

1.3 Human Values

The Clayoquot River planning unit lies entirely within the traditional territory of the Tla-o-qui-aht First Nations. There is one First Nation Reserve partially located in the planning unit: Clayoqua (No. 6), covering 44.5 hectares on the east side of the Clayoquot River mouth. Refer to Map 6 for location.

First Nations' values are discussed in the Scientific Panel's *Report 3: First Nations' Perspectives Relating to Forest Practices Standards in Clayoquot Sound*. In the following passages in *Report 5*, the Scientific Panel highlights the close connection between Nuu-chah-nulth culture and the natural resources of the region:

Nuu-chah-nulth people view the forest and its resources as gifts of the Creator, to be used with respect and to be maintained by careful

³ Department of Fisheries and Oceans. 2005. Fish Wizard Stream Report for Clayoquot River (930-306400-13900).

⁴ Johannes, M., C Robinson & K. Hyatt. 1999. *Kennedy Watershed Atlas Series – Volume I: Watershed Overview, A Working Atlas*. Northwest Ecosystem Institute, Lantzville, BC.

stewardship through the legislative power of tribal government found within "hahuulhi." Traditional practices of resource management include harvesting of selected trees and other forest products; highly selective controlled burning to promote production of berries, to provide grazing areas for deer, and to produce firewood; and monitoring and controlled use of all lands and waters and their resources through stewardship of hereditary chiefs.

Within each community, chiefs' territories - rivers and fisheries, hunting and gathering areas, and portions of the ocean - are delimited by boundary markers such as easily recognizable topographic features. While permanent Nuu-chah-nulth villages are situated along the coast of Clayoquot Sound, economic and cultural activities (e.g., hunting, fishing, plant gathering, and spiritual practices) occur throughout the region, from the ocean and offshore islands to remote places in the mountains. For example, culturally modified trees, places of spiritual significance (especially caves, streams, pools, waterfalls, and offshore islands) which are often personal to individuals and families, and areas used for traditional activities are scattered widely across the landscape. These places and the area's forests and water resources are essential for Nuu-chah-nulth economic, cultural, and spiritual well-being, yet both have been threatened, depleted, or damaged by the activities of non-indigenous peoples.⁵

The Clayoquot River watershed planning unit contains outstanding high elevation karst, sinkhole and cave features.

The planning unit also contains important conservation, research, recreation and tourism features. Two large provincial parks extend into the Clayoquot River plan area from adjacent planning units, and together occupy 32% of this planning unit. Clayoquot Plateau Provincial Park was established to protect several rare plant species; outstanding and fragile high elevation karst, sinkhole and cave features; and a number of small, high elevation lakes. The total area of the park is 3,156 ha, with about 37 percent occurring in this planning unit

Similarly, about 37 percent of Clayoquot Arm Provincial Park lies inside the Clayoquot River plan area. The entire park covers 3,491 hectares; the portion within this planning unit includes Clayoquot Lake and much of the lower Clayoquot River. It was established to protect temperate rainforest and high value salmon habitat, and to provide wilderness recreation opportunities. Refer to Map 6 for park locations.

The land outside the provincial parks and First Nations reserve falls within Tree Farm Licence 57, which is held by Iisaak Forest Resources Limited (Iisaak). There are no privately-held lands or other timber licence areas in the plan area. Refer to Map 6 for location of TFL areas.

There are no mineral tenures in the planning unit, although documented mineral occurrences indicate there is potential for development.

⁵ Report 5, p.38

2.0 The Clayoquot River Watershed Reserve Network

The network of reserves set out in this watershed plan represents the cornerstone of the Scientific Panel's ecosystem management strategy for Clayoquot Sound. For a summary of the reserve types and how they address ecosystem management objectives, as well as details of the inventories and technical analyses involved in the designation of the various reserves, see Volume 1.

2.1 Reserves to Protect Watershed Integrity

Watershed integrity is one of the three primary themes of sustainable ecosystem management identified by the Scientific Panel. The strategy for achieving this goal is the designation of reserves to protect the integrity of the hydroriparian system and the integrity of forest soils.

2.1.1 Hydroriparian reserves

Hydroriparian zones distribute water through the ecosystem and provide important habitat.

The Scientific Panel recognizes the paramount importance of water bodies and their immediate vicinity, describing these zones as the "skeleton and circulation system of the ecological landscape." Hydroriparian ecosystems distribute water through the environment, and also contain the richest and most diverse habitats. These systems are therefore crucial to the protection of watershed integrity.

For a description of the hydroriparian inventory assembled in accordance with the Scientific Panel's classification system, please refer to Volume 1. Due to the lack of detailed hydroriparian inventories for this planning unit, a 50 metre default reserve was applied uniformly along all lakeshores and stream banks.

Approximately 1,890 ha have been designated as hydroriparian reserves for the Clayoquot River planning unit. This represents approximately 24 percent of the total land base of the unit. The hydroriparian reserves are shown on Map 7.

2.1.2 Sensitive soils and unstable terrain reserves

Only stable terrain and resilient soils will be available for forest harvesting.

To reduce the risk of erosion, the Scientific Panel recommends that "only stable terrain and resilient soils should be available for forest

harvesting operations.”⁶ Watershed plans therefore must include reserves to protect sensitive soils and unstable terrain.

The single criterion established for the designation of reserves to protect unstable slopes is that all Class V terrain – that is, the terrain most at risk of slides due to forest harvesting – must be reserved. Sensitive soils requiring reserves at the watershed level are grouped into six categories: bedrock terrain; shallow organic matter; organic soils; blocky and bouldery colluvial material; active colluvial cones or fans and alluvial fans; and poor growing sites.

In this planning unit, unstable terrain reserves (areas of Class V terrain) cover approximately 361 ha; an additional 1,193 ha of the land base are set aside as sensitive soils reserves. These layers overlap at some locations. Together, unstable terrain reserves and sensitive soils reserves cover 1,536 ha (20 percent) of the total land base for the unit. The locations of these reserves are shown on Map 8 and 9.

2.2 Reserves to Protect Biological Diversity

The Scientific Panel acknowledges that “maintenance of biological diversity is inextricably related to the long-term maintenance of healthy, productive ecosystems.”⁷ A series of reserves provide strategies to advance this management objective.

2.2.1 Reserves to protect red- and blue-listed species

The protection of rare species is a key strategy for maintaining biological diversity.

A key strategy for maintaining biological diversity is the protection of rare or threatened species. The Scientific Panel recommends that reserves be established at the watershed level to protect red-listed and blue-listed plant and animal species. At the same time, the Panel notes that some species require protection measures at the site level, and that planning for species protection may also occur at the sub-regional level.

Plant Species

Among the plant communities occurring in the Clayoquot River planning unit, one is red-listed and three are blue-listed. See Appendix 2 for the Conservation Data Centre’s list of red and blue-listed plant communities in Clayoquot Sound.

The red-listed community is Sitka spruce/ salmonberry Very Wet Maritime (CWHvm1/SS). Following advice from the Conservation Data Centre (CDC) the TPC reserves all red-listed communities

⁶ Report 5, p.169.

⁷ Report 5, p.200

occurring in structural stages 6 and 7 (mature and old forest). As a result, the TPC confirmed that over 145 ha (that is, 96 percent of the area supporting this ecosystem) was captured by the reserve network.

The three blue-listed plant communities found in the Clayoquot River planning unit are:

- Amabilis fir - Sitka spruce / devil's club (CWHvm1/AD),
- Amabilis fir - Sitka spruce / devil's club (CWHvm2/AD), and
- Western redcedar - western hemlock/sword fern (CWHvm2/RS).

The TPC was advised to reserve 50 percent of blue-listed plant communities occurring in structural stages 6 and 7. The TPC confirmed this has been reserved.

The list of natural plant communities provided by the CDC includes two yellow-listed ecosystems - with a "vulnerable/apparently secure" ranking, which are found in the Clayoquot River planning unit: Mountain Hemlock-Amabilis Fir/Blueberry (MHmm1/MB), and Amabilis Fir - Western Redcedar / Foamflower (CWHvm2/AF). MHmm1/MB is one of the most common ecological designations in this planning unit, encompassing 1,093 ha, or just over 14 percent of the total planning unit area. For this reason, the TPC decided it was not necessary to set aside more of this site series than was already reserved by other reserve layers - which amounts to about 60 percent of the MHmm1/MB. Similarly, the TPC decided that sufficient CWHvm2/AF (63 per cent) was already captured by other reserve layers

In total, approximately 145 ha (2 percent of the land base of the Clayoquot River planning unit) that support red- or blue-listed plant communities have been identified within the reserve network. The locations of protected plant communities are shown on Map 10.

Generally, individual rare plants will receive protection by site level measures when discovered during stand-level reconnaissance work. In the *Clayoquot Plateau Provincial Park Purpose Statement and Zoning Plan*, the Environmental Stewardship Division states that 29 rare and uncommon plant species are protected within that park.⁸

Animal Species

The Clayoquot River planning unit contains known nesting habitat for the Marbled Murrelet, a provincially red-listed bird. Maximum dawn murrelet counts recorded near the mouth of the Clayoquot River range

⁸ (Ministry of Water, Land and Air Protection, September 2003)

from 329 birds in 1998 to 659 in 1997. These numbers are among the highest for the 19 survey stations monitored.

60 percent of all Class 1 and 2 Marbled Murrelet habitat has been reserved.

In this planning unit, Water, Land and Air Protection biologists (Leigh-Spencer, 2005) identified seven murrelet reserves, totalling 1,060 ha or 14 percent of the Clayoquot River Watershed Planning Unit. More than 568 ha (52% of the murrelet reserve areas) overlap with areas previously reserved for other reasons. Murrelet reserves were established to capture concentrations of important nesting habitat in this planning unit. Additional important habitat is included in reserves for other purposes and in protected areas. In total, approximately 60 percent of all class 1 and 2 Marbled Murrelet nesting habitat has been protected in the various reserve layers and protected areas. Murrelet reserves are shown on Map 11.

Other animals that are vulnerable or of particular management concern in Clayoquot Sound include Roosevelt Elk, Black Bear and Black-tailed Deer. For elk, a blue-listed species, the reserve network captures large areas in valley bottoms - which offer high value winter habitat. Considering that elk appear to be casual visitors, the large amount of reserved areas, plus the suite of management strategies recommended by the Science Panel, are expected to provide more than sufficient year round habitat for a small number of animals. Suitable habitat for Black Bear and Black-tailed Deer is represented in the various reserve layers and protected areas within the Clayoquot River planning unit. Also, stand level management strategies are expected to provide critical habitat for both species - therefore, specific reserves for these species have not been identified as part of this watershed plan.

2.2.2 Reserves to protect forest-interior conditions in mature forests

The Scientific Panel recognizes the importance of maintaining sections of older forests, and of ensuring that these are large enough to maintain conditions similar to those in the interior of historic forests.

Approximately 6,043 ha or 87.2 percent of the forested land base of the Clayoquot River planning unit is currently covered by old growth forests over 141 years old. Sixty-seven percent (4,049 ha) of this old growth is now in forest-interior condition. Both the amount of old growth forest and the amount of old interior forest are well above the minimum amounts recommended by the Scientific Panel. Please refer to Map 12 showing the current locations of old growth and interior old growth forests in the Clayoquot River planning unit.

3,600 ha of old forest (52 percent of the total forested area) are located within provincial parks and within reserves proposed for other values (e.g. hydric riparian, terrain, soils, murrelets, etc.). This amount exceeds

the Scientific Panel recommendation for retention of 40 percent of the forested area as old growth.

Recommendation 7.16 of *Report 5* recommends that a minimum of 20 percent of the retained old forest should be reserved in forest-interior condition. The total forested land base for this planning unit is 6,934 hectares. Applying Scientific Panel recommendations, 2,774 ha (40 percent) must therefore be retained as old growth, and a minimum of 555 ha (20 percent) must be forest interior. At this time, 1,856 ha, or 27 percent of the forested land base, is encompassed within the reserve network as forest-interior condition. Map 13 shows the location of the old and old-interior forest within the reserve network in the Clayoquot River planning unit.

Approximately 27 percent of the old growth in reserves is in forest-interior condition.

2.2.3 Reserves to represent all ecosystems

The Panel recommends that reserves to represent all ecosystems be added to the reserve network “as necessary, to ensure that the entire variety of ecosystems is represented in the reserve system to maintain plants, animals, and other organisms that have specific habitat requirements.”⁹ Representation of all ecosystems is an essential component of biological diversity.

As shown in Table 2.1, there are two biogeoclimatic zones represented within the Clayoquot River planning unit: the Coastal Western Hemlock zone (CWH) and the Mountain Hemlock zone (MH). The CWH is represented by one subzone, which has two variants: the CWHvm1 - Submontane Very Wet Maritime, and the CWHvm2 - Montane Very Wet Maritime. These variants occur below 800 metres. The Mountain Hemlock zone includes one variant, the MHmm1 (Moist Maritime Subzone, Windward Variant) and one sub-variant, the MHmmp1 (Moist Maritime, Parkland). These occur above 800 metres. Refer to Map 4 for the biogeoclimatic classification of this planning unit.

⁹ *Report 5*, p. 171.

Table 2.1 Biogeoclimatic zones, subzones and variants occurring in the Clayoquot River planning unit

Biogeoclimatic Zone	Subzone	Variant	Location	Total Area
Coastal Western Hemlock (CWH)	Very Wet Maritime (CWHvm)	Submontane (CWHvm1)	Below 600 metres.	3,756.4 ha
	Very Wet Maritime (CWHvm)	Montane (CWHvm2)	Between 600 metres & 800 metres.	1,680.0 ha
Mountain Hemlock (MH)	Moist Maritime (MHmm)	Windward (MHmm1)	Above 800 metres near the outer coast	2,062.3 ha
	Moist Maritime (MHmm)	Parkland (MHmmp1)	Depending on location, begins between 1200 and 1250 metres	235.2 ha
Total				7,734 ha

50 different ecosystem types (site series) are found in the Clayoquot River unit.

There are 50 different naturally-vegetated ecosystem types (site series) occurring in the Clayoquot River planning unit: 17 in the CWHvm1; 17 in the CWHvm2; 10 in MHmm1; and 6 in MHmmp1. The most common forested ecosystems are Western Hemlock/Amabilis Fir - Blueberry (AB) and Mountain Hemlock/Amabilis Fir - Blueberry (MB).

Many of the site series occurring in the Clayoquot River planning unit are defined as rare; that is, they cover less than 2 percent of the planning unit or exhibit less than 6 occurrences. Table 2.2 presents an overview of the occurrence and extent of rare site series within the different variants.

Table 2.2: Rare site series in the Clayoquot River Planning Unit

Variant	Rare Natural Vegetated Site Series			
	#	area (ha)	% of variant	% of PU
CWHvm1	13	474.8	12.8	6.1
CWHvm2	16	471.4	28.1	6.1
MHmm1	8	262.7	12.7	3.4
MHmmp1	4	68.8	29.2	0.9
All	41	1,277.7	n/a	16.5

In total, rare site series cover approximately 1,278 ha, or 16.5 percent of the planning unit.

Once the reserves for all other values were mapped, the planning committee determined the degree to which the existing reserve network

achieved the recommended ecosystem representation targets. In the Clayoquot River planning unit, only one ecosystem was found to be underrepresented in the existing reserve network: CWHvm1/YG. All other ecosystem units were represented in the reserve network, in many cases well above the minimum thresholds.

The TPC selected polygons to capture the underrepresented ecosystem unit and added approximately 13.5 ha to the reserve network to ensure complete ecosystem representation. Map 14 shows the location of the polygons added to the reserve network.

2.2.4 Reserves to ensure linkages between watershed planning areas

The Scientific Panel recommends that watershed planning areas be linked in order “to allow migrations of animals, to provide connectivity among plant and animal populations, or to accommodate recreational opportunities.”¹⁰ While such linkages are primarily an objective of sub-regional plans, the Panel also acknowledges that this objective can only be realized after some watershed-level planning has taken place.

Reserves to ensure linkages among watersheds will be established once watershed-level plans are completed for adjacent watersheds.

Once watershed-level plans are completed for a number of adjacent watershed planning units in Clayoquot Sound, opportunities for linkage corridors will be evaluated. Where necessary, reserves that create linkages needed to support biodiversity or recreation objectives will be added to the reserve network.

2.3 Reserves to Protect Human Values

The Scientific Panel recognizes that “many aspects of the Clayoquot Sound environment are important to people – both First Nations and others – for cultural, spiritual, and scenic values, and for recreational and tourism use.”¹¹ Accordingly, reserves to protect these values at the watershed planning level form part of the Panel’s overall framework for sustainable ecosystem management in Clayoquot Sound.

2.3.1 Culturally Important Areas to protect First Nations’ Values

Culturally important areas include sacred sites, historic areas and areas in current use.

The Scientific Panel stresses the importance of maintaining First Nations’ cultural values, dedicating an entire report to an account of First Nations’ perspectives and recommendations on how to incorporate these perspectives in planning and management of land, water and resources in Clayoquot Sound. Culturally important areas include sacred sites, historic areas, and areas in current use. The Panel

¹⁰ Report 5, p. 171

¹¹ Report 5, p. 37

recommends that these areas be identified by the Nuuchahnulth First Nations and that they must be protected in ways that are consistent with traditional knowledge.

Culturally Significant Areas of Tla-o-qui-aht: Mapping and Inventory

Note: The material in this section and on the accompanying map was prepared by the Tla-o-qui-aht First Nations.

Watershed Planning for Tla-o-qui-aht First Nations Cultural Values

The Tla-o-qui-aht First Nations (TFN) are the only First Nations with territory in the Tla-o-qui-aht (Clayoquot River) Watershed Planning Unit. The entire area encompassed by this planning unit lies within their traditional territories.

The TFN are members of the Clayoquot Sound Technical Planning Committee (TPC), which is responsible for watershed level planning in Clayoquot Sound. The TFN are solely responsible for First Nations cultural input with regard to watershed plan areas overlapping with TFN territory. The following Scientific Panel recommendations guide the Tla-o-qui-aht First Nations and the Technical Planning Committee with respect to First Nations cultural input into the watershed plans.

In Report 3 (Scientific Panel, 1995), Recommendation 10 states:

Before the completion of any ecosystem planning process in Clayoquot Sound, the Nuuchahnulth of the area within which the planning is undertaken must be given the opportunity to identify, locate, and evaluate culturally important sites and areas."

Recommendation 15 states:

"Planning inventories undertaken in Clayoquot Sound for ecosystem management must be done in full consultation with and full participation of the Nuuchahnulth of Clayoquot Sound. Nuuchahnulth cultural resources and culturally important areas must be incorporated in planning inventories before completion of the planning process.

In Report 5 (Scientific Panel, 1995), Recommendation 7.16 states:

At the watershed level, map and designate reserves in which no harvesting will occur to protect key hydrospheric ecosystems, unstable slopes and sensitive soils, red- and blue-listed species, late successional forest with forest-interior conditions, important cultural values, and areas with high scenic and recreational resources.

Under direction from Chief and Council, TFN staff initiated a consultative process within their communities to identify, inventory and evaluate areas of cultural importance within their territories. Before beginning, it was necessary for the TFN to develop interview and consultation methodologies and protocol to allow for the collection of

cultural information while respecting that some of this information was confidential or sensitive. Once acceptable protocol was endorsed by the TFN Chief and Council, staff proceeded to collect information from community members through a series of interviews, meetings, and workshops.

After TFN staff identified and inventoried areas of cultural importance for each planning unit, it became necessary to determine how to inform the watershed planning process while respecting the sensitivity of cultural values. Chief and Council provided this guidance. They decided the TFN could provide consultation advice to individual watershed plans without releasing sensitive information - by showing areas of cultural importance on watershed maps, accompanied by explanatory text.

Cultural information has been passed on by TFN Elders to the present *Hawiih* (Hereditary Chiefs) and other community members. The Elders share their knowledge and, through their teachings, confirm *Hahouthlee*, the hereditary chief's responsibility for community, land and resources within their territories.

All information compiled during this project is considered to be confidential, and is stored in the TFN community. It is available to Chief and Council and, at their discretion, to TFN members involved in review of resource management proposals. It is anticipated that this information will facilitate TFN response during future consultations and reviews.

The TFN determined it was not necessary to locate areas of cultural importance within no-harvest reserves, as had been envisioned by the Scientific Panel. Instead, the TFN chose to identify areas according to their significance, and then develop consultation protocol according to the cultural values associated with different classifications.

Map 15 shows the TFN culturally sensitive areas in this watershed planning unit. Also, if not otherwise indicated, all creeks and streams shown on this map are considered to have high cultural significance - and require a buffer equivalent to the Scientific Panel hydriparian reserve width plus an additional 30 percent. It is extremely important to provide protection for water resources within TFN territory because the Tla-o-qui-aht recognize water is critical to life.

Some road corridors are recognized by the TFN as important routes providing access to areas of cultural importance.

All activities proposed within Tla-o-qui-aht territory require consultation to ensure that TFN values and interests are not impacted. The level of consultation and the outcome will differ depending on the cultural significance of the area. For activities proposed in areas not shown to be culturally significant, the TFN expect the review period would be shorter and the TFN response would not request many changes or modifications. However, if a proposed activity is located in a culturally-significant area, depending on the location of the proposed activity, the TFN response would take more time and would likely request modifications or restrictions.

To achieve effective consultation for activities proposed within their territories, the TFN recommend that interested parties or proponents provide Chief and Council with as much information as possible, and as early as possible in the process. Submissions should include descriptions of the activity proposed, maps showing accurate locations of areas involved, and other pertinent details, including but not limited to: timing, access considerations, species affected. The length of time allotted for review must be sufficient to allow the TFN to learn about the proposed activity, consult with Elders and other community members, and consider outstanding information needs. The TFN may request assistance if they anticipate their participation requires extra resources.

The Tla-o-qui-aht First Nations consider all the information provided by the accompanying map and the above text to be part of a dynamic planning process; that is, this information is expected to be adaptive and to change and evolve in response to new knowledge and experiences.

Approximately 4,208 ha, or 54 percent of the planning unit, have been identified by the Tla-o-qui-aht First Nations to be of cultural significance. Seventy-eight percent of this area overlaps with the watershed reserve network. Map 15 shows the locations of TFN culturally-significant areas.

2.3.2 Protection of scenic values

Landscape appearance is important both for aesthetic reasons and as an indicator of the health of the forest.

The Scientific Panel acknowledges that “landscape appearance is important to Nuu-chah-nulth, other residents, and visitors to Clayoquot Sound, both for aesthetic reasons and as a potential indicator of the health of the forest resource.”¹² Accordingly, the Panel identified the protection of scenic values as one component of the ecosystem management theme of maintaining human values.

¹² Report 5, p. 40

In the Clayoquot River planning unit, the scenic class objectives that have been assigned include scenic class 1 (small-scale alteration); scenic class 2 (minimal alteration); and scenic class 3 (natural-appearing). These scenic classes have been applied to ensure that areas of especially high scenic value receive the greatest level of protection. In addition to assigning visually sensitive areas to the above scenic class objectives, many unaltered areas with the highest visual values are located within provincial parks or placed within reserves identified for other resource values, and are thus provided the highest level of protection.

Scenic values are protected by management standards rather than through reserves.

As noted above, while reserves have not been established specifically for scenic values, many areas with identified scenic areas have been preserved within existing parks and reserves for other values. Scenic values located within the harvestable areas in the Clayoquot River planning unit are maintained through management criteria designed to achieve scenic class objectives and standards (see Volume 1 for these management criteria).

Table 2.3 presents the breakdown of area within each scenic class in the visible portion of the Clayoquot River planning unit, both within reserves and within the harvestable area.

Table 2.3 Clayoquot River - scenic classes by area

Scenic Class	Reserves	Harvestable Area	Total* Ha
Natural - Appearing	14	0	14
Minimal Alteration	1,061	464	1,548
Small-Scale Alteration	30	69	99
TOTAL	1,105	533	1,661

* Total Ha may include scenic class areas that are not located in reserves or harvestable areas

Areas comprising 21 percent of the Clayoquot River unit have been assigned scenic class objectives.

In total, 1,661 ha or 22 percent of the planning unit have been assigned scenic class objectives. Of these, 1,105 ha (almost 67 percent) are located within parks and reserves.

The portion of scenic area in Clayoquot River that is located within the harvestable area will be managed in accordance with the assigned scenic class objective. Timber harvesting and road building operations within these scenic areas will be guided by the management criteria presented in Volume 1.

The remaining landscape is not classified because it is largely not visible from communities, recreation sites, or travel corridors. Any future development in these non-visible areas will take place according to Scientific Panel recommendations. In the case of future timber

harvesting, variable retention silvicultural systems will be employed in all areas, visible and non-visible.

Map 16 shows the location of the various scenic class objectives.

2.3.3 Reserves to protect recreation and tourism values

Protection of areas with significant recreation and tourism values at the watershed level forms part of the Scientific Panel's strategy to maintain the human values associated with the Clayoquot Sound ecosystem.

Clayoquot Plateau Provincial Park, at 3,156 ha, was established to protect one of the best examples of a "self-contained coastal karst ecosystem in a completely undisturbed condition."¹³ MWLAP notes this "area is superior to other karst areas for its diversity of landforms, geological and vegetation features." The park also protects First Nations prehistoric use sites and provides wilderness recreation opportunities. Much of this park lies beyond the planning unit boundaries; however, the portion within the Clayoquot River planning unit contains many significant features.

Similarly, a sizable proportion of Clayoquot River Provincial Park lies outside the Clayoquot River planning unit, but the area that is included contains many of this park's important attributes. These include Clayoquot Lake, the lower portion of the Clayoquot River, and a section of the river's upper portion and several tributaries. These areas support a significant fishery and provide wildlife habitat, and thereby offer wilderness sport fishing and ecotourism opportunities.

Another important feature in this planning unit is the Clayoquot Valley Witness Trail. This trail, constructed in 1993, enters the planning unit near "Upper Solstice Lake" from the upper Kennedy River valley southwest of Snag Lake. The trail continues south, following and parallel to the Clayoquot River, as far as Delessio Creek (also known as Tributary A), which it then follows to the height-of-land, re-entering the Kennedy River valley via the Olympic Creek headwaters. Because of its proximity to the river and large creeks, the trail is largely located within hydriparian and other reserves.

In addition to the areas that fall within the scenic classes and within reserves for other purposes, such as hydriparian reserves, approximately 57 ha containing features of high to very high recreation significance have been added to the reserve network. These areas are located primarily around lakes. This represents 0.7 percent of the total

¹³ Ministry of Water, Land and Air Protection (2003) *Clayoquot Plateau Provincial Park Purpose Statement and Zoning Plan*. The Environmental Stewardship Division. September 2003.

land base of the Clayoquot River planning unit. This reserve layer (Map 17) overlaps almost entirely with the hydroriparian reserve layer.

2.4 Summary: The Clayoquot River Watershed Reserve Network

The watershed reserves identified for the Clayoquot River unit are a cornerstone of the Scientific Panel's framework for sustainable ecosystem management. They are designed to maintain watershed integrity, key components of biological diversity, First Nations' cultural values, and scenic and recreational values and opportunities.

As described in Volume 1, six of the nine different reserve types identified for the Clayoquot River planning unit are reserves in a strict sense; that is, forest harvesting is prohibited under normal circumstances. Exceptions are described in Section 2.5 of Volume 1.

Strict reserves include those established to protect watershed integrity and biological diversity:

- hydroriparian reserves
- reserves for unstable terrain and sensitive soils
- reserves for red and blue-listed species
- reserves to protect forest-interior conditions in late successional forest
- reserves to represent all ecosystems
- reserves to ensure linkages among watershed-level planning areas.

Reserves to protect human values are better characterized as special management zones.

In contrast, many of the areas identified to protect human values – culturally important areas, scenic areas and recreational or tourism values – are included within reserves or special management zones. Most areas associated with these values are not excluded from harvesting; however, certain conditions and requirements must be met before harvesting may proceed. Volume 1, Section 3 describes management criteria for special management zones.

A total of 65 percent of the Clayoquot River planning unit has been reserved.

Map 18 shows all the reserves in the Clayoquot River planning unit. A total of 5,025 ha or 65 percent of the planning unit has been reserved. Many of the different reserves overlap and reserve totals and percentages are thus not cumulative. In other words, a given reserve location may be designated for a number of different reasons, and serve a multitude of conservation objectives.

3.0 Sustainable Ecosystem Management in the Clayoquot River Watershed Planning Unit

3.1 Management Criteria for Special Management Zones

The areas in the Clayoquot River planning unit that are identified to protect human values – that is, First Nations’ culturally important areas and areas identified for their scenic, recreational and tourism values - are better characterized as special management zones, rather than strict reserves. These special management zones are generally accessible for forest harvesting, subject to certain limits and conditions designed to preserve the areas’ sensitivities. Only areas of highest significance within these special management zones are excluded from harvesting.

The Scientific Panel also refers to special management zones in the context of hydriparian reserves, specifically in R7.30 and 7.31 relating to lakes.

This section describes the special conditions, considerations and procedures that apply in each special management zone type.

Culturally Important Areas

Approximately 54 percent of the area of the Clayoquot River planning unit has been identified by the Tla-o-qui-aht First Nations as having cultural significance. Consistent with traditional knowledge, culturally important areas are not designated as “reserves.” Rather, the designation “culturally significant” indicates that a more stringent consultation process must be engaged in order to initiate any development proposals (please refer to section 2.3.1 of this volume). Based on the cultural significance and sensitivity of the area in question, the consultation process will determine the compatibility of the development proposal with First Nations rights and interests. The process will also identify whether special conditions, considerations and procedures need to be followed should the development proceed.

Scenic Areas

Lands representing approximately 21 percent of the planning unit have been classed as scenic areas. Sixty-seven percent of these areas are located within parks or reserves for other values, and are therefore excluded from timber harvesting operations. Most of the balance is located within the harvestable area. While this area is available for timber harvesting, management activities will be guided by standards

and criteria designed to ensure that the applicable scenic class objectives are achieved.

Volume 1 describes the management standards that apply for each scenic class objective in this watershed planning unit. As proposed by the Scientific Panel, the standards are descriptive and qualitative in nature, avoiding quantification of levels of alteration and green-up.

To ensure that the applicable scenic class objectives are achieved, visual landscape design principles will be applied in the development of harvesting proposals. In accordance with Scientific Panel recommendation R6.6, visual impact assessments will be conducted prior to commencement of harvesting operations on all of the most important scenic areas (this includes, at a minimum, all areas within the 'natural appearing' scenic class objective).

For a breakdown of scenic class objectives by area for this planning unit, please refer to section 2.3.2. Map 19 shows the location of scenic areas in relation to the reserve network and the harvestable area.

Recreation and Tourism

Lake shores, as well as special features such as significant trails and waterfalls, are protected by reserve buffers of varying widths. Management zones adjacent to these reserves serve to maintain the integrity of the buffers. In the Clayoquot River planning unit, the management zones for recreation and tourism amount to 171 ha (Map 17). Of this, 135 ha (79 percent) overlaps with the reserve layer and 36 ha (21 percent) occurs within the harvestable areas. A buffer has not been identified for the Clayoquot Witness Trail because data for its location are not available. A considerable portion of this trail is known to lie within the zone identified by the Tla-o-qui-aht as hydroriparian cultural areas – therefore, will benefit from protection for hydroriparian and cultural values. Please refer to Volume 1 for a description of reserve and management zones.

Forest practices and the application of the retention system in the management zones need to be designed to ensure the integrity of recreation and tourism values encompassed in the reserves. Many (if not most) recreation and tourism features, settings and opportunities are valued for the visual enjoyment and experience they provide. For this reason, the visual impact of any forest practices must be managed and should remain minor within recreation and tourism management zones. This may be achieved by following the management standards described in Volume 1.

Lakes

The panel recommends that a special management zone be designated around all lakes, adjacent to the hydroriparian reserve zone. This special management zone is to extend 20 m beyond the reserve zone, or up to the edge of the hydroriparian influence, whichever is greater.

The panel states that the special management zone around lakes may be subject to retention systems of harvest provided it is outside the hydroriparian reserve proper. The management zone will function as a buffer to protect the integrity of the reserve zone next to the lakeshore.

3.2 Management Criteria for Sensitive Sites

Over the years, the TPC consulted a number of experts for assistance with watershed level planning. These experts recognized the limitations inherent in the scale and intensity of watershed-level mapping. Accordingly, some provided recommendations regarding site-level measures that should be undertaken to ensure that sensitive sites are afforded adequate protection prior to and during operational management activities. Site level recommendations address a variety of sensitive sites and features, including terrain, soils and wildlife habitat.

Terrain and Soils

A team of soils and terrain specialists provided advice to the TPC on unstable terrain and sensitive soil reserves. This team described instances where terrain or ecosystem mapping does not provide sufficiently detailed information to determine whether a terrain or sensitive soils reserve is needed, or where specifically the reserve should be. The team recommended that, in such instances, the resource management decisions be based on site level assessments. See Table 3.2 in Volume 1 for the terrain types or features that should be field assessed, including any site-level management recommendations referenced in the consultation report.

Plants and Wildlife

The Scientific Panel provided recommendations for the protection of sensitive plant and animal species through the designation of reserves at the watershed level, and this watershed plan describes the area and locations of reserves. The Scientific Panel was mindful, however, that for many species, protection could often be better implemented at the site level. Consequently, the Panel recommended that more refined information be collected at the site level about plant and animal species considered to be at risk by human activity. The Panel described the biodiversity objective at the site level as confirming the presence or

absence of species or habitats that will affect operational management of the site.

In addition to the Scientific Panel recommendations pertaining to site-level information and management requirements for species at risk, further information on accommodating these species and other important vertebrates of concern, at both the watershed and site level, can be found in the 2003 TPC report entitled *Clayoquot Sound Watershed Level Planning - Wildlife Habitat Overview*.

3.3 Silviculture, Harvesting and Transportation Systems

The Scientific Panel sets out guidelines for a new silviculture system known as the Variable Retention Silviculture System (VRSS). This system is used in all forestry activities in Clayoquot Sound. The Scientific Panel recommendations also provide guidance to forestry operators with respect to harvesting and transportation systems. For details of these recommendations and their application to ecosystem management in this watershed planning unit, please see Volume 1, Sections 3.2, 3.3 and 3.4.

3.4 Rate-of-cut

Rate-of-cut limits protect hydrological integrity. The calculation of rate-of-cut will occur at the site level of planning.

For the purposes of this watershed plan, the Panel's recommendations with respect to rate-of-cut are interpreted as limits imposed on forest development operations in order to protect the hydrological integrity of watersheds. Limits to the rate-of-cut apply to individual watersheds within the Clayoquot River planning unit. Table 3.1 identifies the individual watersheds within this planning unit and sets out the rate-of-cut limits assigned in accordance with the Scientific Panel recommendation R3.1. Map 21 shows the individual watersheds for this planning unit. Volume 1 describes the methodology used to assign rate-of-cut limits in Clayoquot Sound.

Table 3.1: Rate-of-Cut Limits for Clayoquot River Planning Unit

Watershed or Map Unit	WS ID	Type	Area (ha)	Does Rate-of-cut Rule Apply?	5 Year Cut (ha)	10 Year Cut (ha)
4.3.6 Total		Tertiary Watershed, >500 ha	7,638	Yes	381.9	-
4.3.6	1131	Tertiary - residual area	1,866	No	-	-
4.3.6.1	1254	Quaternary Watershed, >500 ha	707	Yes	35.4	-
4.3.6.2	1219	Quaternary Watershed, <=500 ha	226	No	-	-
4.3.6.3	1198	Quaternary Watershed, <=500 ha	345	No	-	-
4.3.6.4	1224	Quaternary Watershed, >500 ha	1,003	Yes	50.2	-
4.3.6.5	1143	Quaternary Watershed, >500 ha	645	Yes	32.3	-
4.3.6.6	1164	Quaternary Watershed, >500 ha	1,085	Yes	54.3	-
4.3.6.7	1117	Quaternary Watershed, <=500 ha	354	No	-	-
4.3.6.8	1024	Quaternary Watershed, >500 ha	795	Yes	39.8	-
4.3.6.9	1082	Quaternary Watershed, >500 ha	610	Yes	30.5	-

The Ministry of Forests and Range will verify that forest development plans are consistent with rate-of-cut limits.

It is the forest tenure holder's responsibility to ensure that the amount of development proposed within a given watershed is consistent with the rate-of-cut that applies for that particular watershed. The Ministry of Forests and Range will verify that forest development proposed by licence holders is consistent with applicable rate-of-cut limits.

As described above, rate-of-cut will be determined at the site level in accordance with watershed-level objectives. Rate-of-cut will also be calculated at the management unit level; that is, rate-of-cut limits will be considered along with other factors in the Chief Forester's determination of the AAC for a given tree farm licence or other management unit (or portion thereof) within Clayoquot Sound.

3.5 Restoration

While most Scientific Panel recommendations focus on the implementation of new planning approaches and new forest practices to maintain ecosystem integrity, the Panel also recognizes that past practices have led to some environmental damage and degradation. Recommendation R3.12 calls for the development of restoration plans where forest values have been degraded, with an initial focus on hydriparian areas and large clearcuts.

Restoration work is not needed within this planning unit because natural and human disturbances have been limited, and the scale of

cumulative disturbances has not surpassed the ability for recovery to occur on its own.

3.6 Summary: Harvestable Area in the Clayoquot River Planning Unit

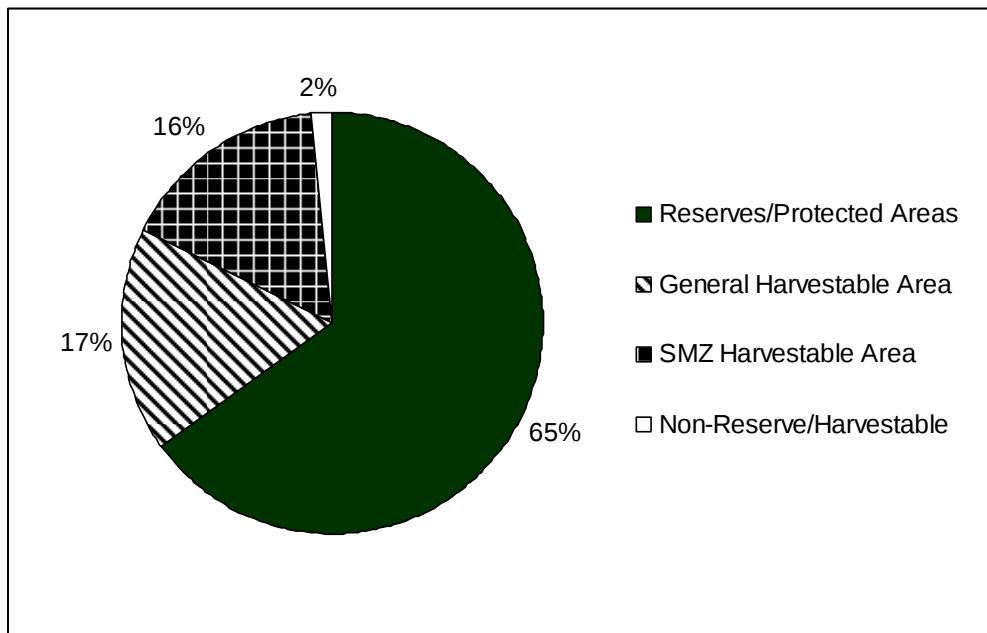
The harvestable area is the area that lies outside designated reserves. Forest harvesting can take place within the harvestable area as long as it is undertaken in a manner consistent with the Scientific Panel recommendations relating to operations, the *Forest Practices Code of British Columbia Act*, the *Forest and Range Practices Act* and the special management considerations described in Volume 1.

Approximately 37 percent of the forested land base of the Clayoquot River planning unit is designated as harvestable area.

Approximately 2,580 ha, or 37 percent of the forested land base in the Clayoquot River watershed planning unit, have been designated as harvestable area. The remainder is in reserves.

Special Management Zones comprise approximately 1,233 ha, or 48 percent of the harvestable area. Map 20 shows the location of the harvestable area, including Special Management Zones, as well as the reserve network. Figure 3.1 shows the proportion of designated reserves, Special Management Zones and general harvestable area (i.e., without special management zone designation) in the Clayoquot River planning unit.

Figure 3.1 Reserves and Harvestable Area in the Clayoquot River Planning Unit



Appendix 1: Clayoquot Sound Technical Planning Committee

Membership on the Technical Planning Committee changed during the period it took to complete *Watershed Planning in Clayoquot Sound, Volumes 1 to 9*. The following list includes membership throughout this period:

Nelson Keitlah, First Nations Co-chair, Nuuchah-Nulth Tribal Council
Central Region Chiefs

Rudi Mayser, Provincial Co-chair, Integrated Land Management
Bureau, Ministry of Agriculture and Lands

Jackie Godfrey, First Nations Co-chair Alternate, Central Region Chiefs
Executive

Matthew Lucas, former Representative for Hesquiaht First Nation

Guy Louie, Representative for Ahousaht First Nation

Thomas Martin, Representative for Tla-o-qui-aht First Nations

Simon Tom, former Representative for Tla-o-qui-aht First Nations

Brian Retzer, Provincial Co-chair Alternate, ILMB, MAL

Mike Amrhein, former Clayoquot Sound Central Region Board Liaison

Dean Fenn, Ministry of Forests Liaison

Peter Verschoor, former Central Region Chiefs Strategic Planning
Forester

Marylin Touchie, Representative for Ucluelet First Nation

Colleen Charleson, Representative for Hesquiaht First Nation

Patricia McKim, Clayoquot Sound Central Region Board Liaison

Associates:

Dan Sirk, Land Information Coordinator, ILMB, MAL

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Anette Thingsted, Planning Officer, ILMB, MAL

Lindsay Jones, Manager Representative, ILMB, MAL

Appendix 2: Red- and Blue-listed Plant Communities in Clayoquot Sound

Rare Plant Communities	Rank	Associated Ecosystem Units		
<u>Red-Listed</u>		BEC unit	Site Series	
			Number	Symbol
<i>Picea sitchensis</i> / <i>Maianthemum dilatatum</i> (Sitka spruce / false lily-of-the valley)	S2	CWHvh1	08	SL
<i>Picea sitchensis</i> / <i>Rubus spectabilis</i> (Sitka spruce / salmonberry)	S2	CWHvm1	09	SS
[<i>Anaphalis margaritacea</i> – <i>Aster foliaceus</i> (pearly everlasting - leafy aster)	S2	MHmm1	00	n/a]
[<i>Carex macrocephala</i> (large headed sedge) herbaceous community	S1S2	CWHvh1	00	n/a]
[<i>Phlox diffusa</i> - <i>Selaginella wallacei</i> (spreading phlox - Wallace's selaginella club moss)	S2	MHmm1	00	n/a]
<i>Picea sitchensis</i> / <i>Trisetum canescens</i> (Sitka spruce / tall trisetum grass)	S2	CWHvh1	09	ST]
<u>Blue-Listed</u>				
<i>Alnus rubra</i> / <i>Maianthemum dilatatum</i> (red alder / false lily-of-the valley)	S3	CWHvh1	10	AL
<i>Picea sitchensis</i> / <i>Eurhynchium oreganum</i> (formerly <i>Kindbergia oregana</i>) (Sitka spruce / Oregon beaked-moss)	S3	CWHvh1	15	SK
<i>Picea sitchensis</i> / <i>Polystichum munitum</i> (Sitka spruce / sword fern)	S3	CWHvh1	17	SW
<i>Thuja plicata</i> / <i>Picea sitchensis</i> - <i>Lysichiton americanus</i> (western redcedar - Sitka spruce / skunk cabbage)	S3	CWHvh1	13	RC
<i>Thuja plicata</i> / <i>Picea sitchensis</i> - <i>Lysichiton americanus</i> (western redcedar - Sitka spruce / skunk cabbage)	S3	CWHvm1	14	RC
<i>Thuja plicata</i> - <i>Picea sitchensis</i> / <i>Polystichum munitum</i> (western redcedar - Sitka spruce / sword fern)	S2S3	CWHvh1	05	RF
<i>Thuja plicata</i> - <i>Tsuga heterophylla</i> / <i>Polystichum munitum</i> (western redcedar - western hemlock / sword fern)	S3?	CWHvm1	04	RS
<i>Thuja plicata</i> - <i>Tsuga heterophylla</i> / <i>Polystichum munitum</i> (western redcedar - western hemlock / sword fern)	S3?	CWHvm2	04	RS
[<i>Abies amabilis</i> - <i>Picea sitchensis</i> / <i>Oplopanax horridus</i> (amabilis (silver) fir - Sitka spruce / devil's club)	S3	CWHvm1	08	AD]
[<i>Abies amabilis</i> - <i>Picea sitchensis</i> / <i>Oplopanax horridus</i> (amabilis (silver) fir - Sitka spruce / devil's club)	S3	CWHvm2	08	AD]
<i>Picea sitchensis</i> / <i>Calamagrostis nutkaensis</i> (Sitka spruce / Nootka reedgrass)	S3	CWHvh1	16	SR]
<i>Picea sitchensis</i> / <i>Carex obnupta</i> (Sitka spruce / slough sedge)	S3	CWHvh1	18	SE]
<i>Picea sitchensis</i> / <i>Malus fusca</i> (Sitka spruce / Pacific crab apple)	S3	CWHvh1	19	SC?]
[<i>Populus balsamifera</i> ssp. <i>trichocarpa</i> / <i>Cornus stolonifera</i> (black cottonwood / red-osier dogwood)	S3	CWHvm1	10	CD]
[<i>Tsuga heterophylla</i> – <i>Picea sitchensis</i> / <i>Rhytidiadelphus loreus</i> (western hemlock - Sitka spruce / lanky moss)	S3	CWHvh1	04	HM]
<u>Yellow-Listed</u>				
<i>Abies amabilis</i> - <i>Thuja plicata</i> / <i>Tiarella trifoliata</i> (amabilis (silver) fir - western redcedar / foamflower)	S3S4	CWHvm2	05	AF
<i>Thuja plicata</i> – <i>Chamaecyparis nootkatensis</i> / <i>Lysichiton americanus</i> (western redcedar - yellow-cedar / skunk cabbage)	S3S4	CWHvm2	11	RC
<i>Tsuga mertensiana</i> – <i>Abies amabilis</i> / <i>Vaccinium alaskaense</i> (mountain hemlock - amabilis (silver) fir / Alaskan blueberry)	S3S4	MHmm1	01	MB

*Source: BC Conservation Data Centre (CDC), November, 2004

Note: Communities found in the Clayoquot River watershed planning unit are shown above in grey shading.

Notes on ranking system:

S1 - Critically Imperiled because of extreme rarity in the province, or because of some factor(s) making it especially vulnerable to extirpation from the province. Typically, there will be 5 or fewer occurrences or very few remaining individuals (<1,000).

S2 - Imperiled because of rarity (typically 6-20 extant occurrences or few remaining individuals) or because of some factor(s) making it vulnerable to extirpation or extinction.

S2S3 is used to indicate uncertainty about the exact status of a taxon; may fall within S2 or S3 rankings.

S3 - Vulnerable provincially either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extinction.

S4 - Apparently Secure is uncommon but not rare, and usually widespread in the nation or province; possible cause of long-term concern; usually more than 100 occurrences and more than 10,000 individuals.

[] - Denotes communities which are not classified as distinct ecosystem units in the TEM data base which supports sub-regional and watershed level planning; these communities may, however, be encountered at the site level of planning.

List of Maps

Map 1	Clayoquot Sound Land Use Decision
Map 2	Clayoquot River Planning Unit – Clayoquot Sound
Map 3	Clayoquot River Planning Unit – Topographic Relief
Map 4	Clayoquot River Planning Unit – Biogeoclimatic Ecosystem Classification (BEC)
Map 5	Clayoquot River Planning Unit – Forest Age Distribution
Map 6	Clayoquot River Planning Unit – Land Status
Map 7	Clayoquot River Planning Unit – Hydroriparian Reserves
Map 8	Clayoquot River Planning Unit – Terrain Stability Reserves
Map 9	Clayoquot River Planning Unit – Sensitive Soils Reserves
Map 10	Clayoquot River Planning Unit – Reserves for Red- and Blue-listed Plant Communities
Map 11	Clayoquot River Planning Unit – Marbled Murrelet Reserves
Map 12	Clayoquot River Planning Unit – Current Old Forest and Forest-interior Old Forest
Map 13	Clayoquot River Planning Unit – Forest-interior Old Forest within Reserve Network
Map 14	Clayoquot River Planning Unit – Reserves added for Ecosystem Representation
Map 15	Clayoquot River Planning Unit – Tla-o-qui-aht First Nations Culturally Significant Areas
Map 16	Clayoquot River Planning Unit – Scenic Management Classes
Map 17	Clayoquot River Planning Unit – Reserves for Recreation/Tourism Values
Map 18	Clayoquot River Planning Unit – Reserve Network
Map 19	Clayoquot River Planning Unit – Scenic Management Classes and Reserve Network
Map 20	Clayoquot River Planning Unit – Reserves and Harvestable Areas
Map 21	Clayoquot River Planning Unit – Watershed Rate of Cut Limits