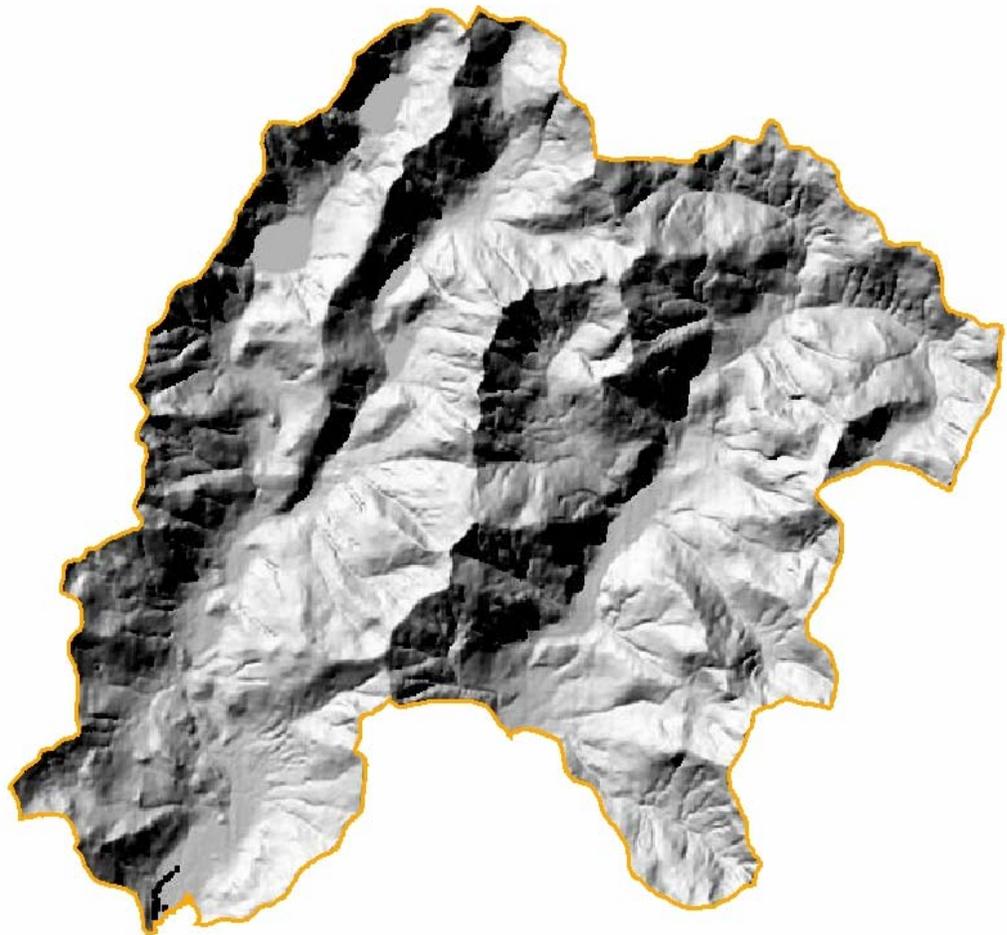


WATERSHED PLANNING IN CLAYOQUOT SOUND

VOLUME 2:

TOFINO - TRANQUIL (ONADSILTH - EELSEUKLIS)

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'.

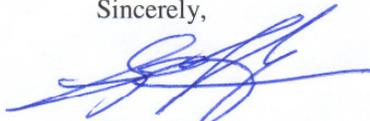
The Board made one other significant recommendation in its two letters: that the Parties identify the resources to develop and implement a comprehensive monitoring program. Now that the watershed planning process is drawing to a close, the Parties are pleased to announce we have begun discussions regarding 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.

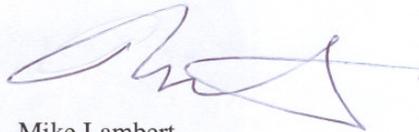
Further, we would like to thank the CRB, the Central Region First Nations, various stakeholders and interest groups, local governments, and members of the public for their contributions to the development of these plans - and, for their thoughtful comments during each review process.

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 Tofino-Tranquil 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 Tofino Creek and Tranquil Creek watersheds, in accordance with the Scientific Panel recommendations for sustainable ecosystem management in Clayoquot Sound.

The effective date of this plan will be July 31, 2006. The 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.

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Executive Summary

This watershed plan encompasses the entire Tofino - Tranquil watershed planning unit. This planning unit, 11,630 ha in size, is bounded to the west by the Bulson Valley, to the north by the Upper Kennedy River headwaters, to the east by the Clayoquot River valley, and to the south by Tofino and Tranquil Inlets (see map 2).

This watershed plan was developed in accordance with the principles and recommendations set out by the Clayoquot Sound Scientific Panel to guide planning for sustainable ecosystem management in Clayoquot Sound. It 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 which require that certain conditions and limitations be 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 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 reserve plan for the Tofino-Tranquil 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 Tofino-Tranquil Watershed Reserve Network

The Scientific Panel proposed 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 1,869 ha have been designated as hydroriparian reserves. This represents approximately 16 percent of the total land base of the Tofino-Tranquil watershed planning unit (see map 7).

Reserves to protect sensitive soils and unstable terrain

Unstable terrain reserves (areas of Class V terrain) cover approximately 1,580 ha, or 14 percent of the unit. Reserves for sensitive soils cover 2,153 ha or 19 percent of the land base. These layers overlap each other and other reserves at several locations. Together unstable terrain reserves and sensitive soils reserves make up 3,398 ha or 29 percent of the total land base of the Tofino-Tranquil watershed planning unit (see maps 8 and 9).

Biological Diversity

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

Approximately 818 ha have been set aside into four separate Marbled Murrelet reserves within the Tofino-Tranquil watershed planning unit. 38 percent of this area (317 ha) was already reserved for other purposes. These four reserves, in combination with other reserves and protected areas, protect approximately 2,108 ha of class 1 and 2 Marbled Murrelet nesting habitat in this planning unit. This amounts to 54 percent of the class 1 and 2 habitat, or 18.1 percent of the land base (see map 11).

Approximately 91 ha, 0.8 percent of the land base of the Tofino-Tranquil 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 7,241 ha of old forest within the Tofino-Tranquil watershed planning unit. This represents 69 percent of the total forested land base. Of this, the reserve network encompasses approximately 3,299 ha, or 32 percent of the forested land base. To satisfy the Scientific Panel recommendation for minimum old growth retention of 40 percent, an additional 880 ha will have to be retained. Since there are 3,941 ha of old growth outside the reserve network, there is sufficient area remaining to meet the management objective.

2,353 ha are classed as forest-interior condition. This fully meets the old-interior forest recommendations of the Science Panel (see maps 12 and 13).

Reserves to represent all ecosystems

After the reserve network had been completed, the Committee found that 381 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 5,434 ha, or 47 percent of the Tofino-Tranquil watershed planning unit, has been identified by the Tla-o-qui-aht First Nations (TFN) to be of high or moderate cultural significance. For reasons of

confidentiality, the cultural values map included in this report shows only the general locations of sites of cultural importance. The TFN have also identified areas that offer economic opportunity to their communities (see map 15).

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, 4,101 ha, or 35 percent, of the lands within the Tofino-Tranquil watershed planning unit have been assigned scenic class objectives: 1,406 ha to the natural-appearing scenic class objective, 1,554 ha within the minimal alteration class and 1,141 ha within the small-scale alteration class. The remaining landscape is not classified because it is largely not visible from communities, recreation sites, and travel corridors. Of the scenic class areas, approximately 2,175 ha (53 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 82 ha containing features of high to very high recreation and tourism significance have been reserved, primarily around large lakes. This represents 0.7 percent of the land base of this planning unit. Areas surrounding recreation/tourism reserves have been identified as special management zones (see map 17).

Summary

A total of 5,768 ha, representing 50 percent of the land base of the Tofino-Tranquil watershed planning unit, have been reserved from harvesting in accordance with the recommendations of the Scientific Panel (see map 18).

The Tofino-Tranquil Harvestable Area

Once all the watershed reserve areas are mapped, the remaining area outside reserves is designated as the harvestable area. Forest harvesting and other resource 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 Tofino-Tranquil watersheds encompasses 5,521 ha of productive forest, representing 48 percent of the planning unit. Special management zones comprise 2,792 ha (51 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 provided 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 Tofino - Tranquil (Onadsilth - Eelseuklis) Planning Unit

1.1 The Physical Landscape

The Tofino-Tranquil watershed planning unit is located northeast of Tofino, bounded by the Upper Kennedy River headwaters to the north, Clayoquot River to the west, the Bulson Valley to the east and Tofino and Tranquil Inlets to the south. The planning unit encompasses Tofino Creek and Tranquil Creek and their tributary watersheds, as well as the Marble Creek / Onad Creek watershed, which drains into Deer Bay at the end of Tofino Inlet. The total area of the planning unit is 11,630 ha. Map 2 shows the location of the Tofino-Tranquil watershed planning unit within the Clayoquot Sound Land Use Decision area.

The climate in the Tofino-Tranquil unit - as throughout the west coast of Vancouver Island - is temperate and very wet. Annual precipitation exceeds 3,000 mm, but may be substantially greater at higher elevations further inland. Mean daily temperatures range from 5° C in January to 15° C in August.

Most of Vancouver Island was covered by glaciers during the Pleistocene period, and a number of features and landmarks in the planning unit bear witness to this. Both Tofino Creek and Tranquil Creek flow through U-shaped valleys, a characteristic glacial landform. Virgin Falls, approximately half way up Tofino Creek, marks another classic glacial landform, a hanging valley.

Tofino Creek is a low gradient, boulder-cobble, alluvial stream which follows a wide valley with many tributaries. The Tranquil watershed is steep and rugged throughout, apart from the valley bottom of the main tributary and Tranquil Creek itself, which is a wide, alluvial sandy-gravel channel. Four lakes along the upper channels of Tranquil and its main tributary are likely remnants of the valley's glaciation.

The surficial geology of the Tofino-Tranquil unit is dominated by steep, rocky slopes with a discontinuous veneer of colluvium on mid and upper slopes, and a mantle of till mostly on the gentler mid and lower slopes. Fluvial sediments are restricted to the valley bottom and occur as floodplains and fluvial fans. Marine and glaciomarine sediments are limited to the west side of Tranquil Inlet. Gully erosion, rock falls, debris slides, debris flows and avalanches are among the most common geomorphological processes in the area.

Elevations within the planning unit range from sea level, at the estuaries of Tofino Creek and Tranquil Creek, to over 1500 meters, at the north end of Tranquil Creek. Map 3 illustrates the topographic relief of this unit.

1.2 The Ecological Landscape

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

Two biogeoclimatic ecosystem classification (BEC) zones occur in the Tofino-Tranquil watershed planning unit: the Coastal Western Hemlock (CWH) and the Mountain Hemlock (MH). The CWH zone occupies almost 70 percent of the planning unit and is represented by three variants. The CWHvh1 variant (the Southern Very Wet Hypermaritime variant) extends a very short distance into this planning unit at the mouth of Tofino Creek. The area covered is less than 20.0 ha. The CWHvm1 variant (Submontane Very Wet Maritime) occurs below 600 m elevation, and covers approximately half the planning unit. The CWHvm2 variant (Montane Very Wet Maritime) is located along the upper slopes at elevations between 600 and 800 m.

The MH biogeoclimatic zone is found at higher elevations. The MHmm1 variant (Windward Moist Maritime) and the MHmmp1 variant (Windward Moist Maritime Parkland) occur at elevations of over 900 m and over 1200 m, respectively. The latter variant is not forested. Refer to Map 4 for BEC variant locations.

Over 40 different vegetated ecosystem types are represented within the Tofino-Tranquil watershed planning unit. The most common are Western Hemlock/Amabilis Fir - Blueberry (AB), Mountain Hemlock/Amabilis Fir - Blueberry (MB), Western Hemlock/Amabilis Fir - Deer fern (HD), and Western Hemlock/Western Redcedar - Salal (HS).

Approximately 69 percent of the Tofino - Tranquil forested land base supports ecosystems that are over 140 years old. Less than 20 percent of the planning unit has been harvested. Most of this harvesting occurred over the past 30 years, although a small amount took place 60 to 70 years ago. Harvested areas now support second growth forests of various ages. 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.

Over 40 different ecosystems are represented in the Tofino-Tranquil Watershed Planning Unit.

Nesting habitat has been reduced in the portions of this planning unit that have been harvested, mainly along the lower reaches of Tofino and Tranquil Creeks.

The Tofino Creek watershed supports Rainbow Trout, Dolly Varden, Chum, Coho, winter- and summer-run Steelhead, Prickly Sculpin, and other coastal sculpin species. An historical Chinook run is considered extirpated from this creek. There are several opportunities for stream restoration in this watershed. The Tranquil Creek watershed supports Rainbow Trout, Dolly Varden, Chum, Chinook, Coho, winter-run Steelhead, Prickly Sculpin, and coastal sculpin species. Paradise Lake has been stocked with Rainbow Trout. See Appendix 2 for more information.

Black Bears are common throughout Clayoquot Sound. In this planning unit, forest harvesting may have contributed to an increase in bear numbers, due to the creation of early seral communities which provided an abundant supply of fruit-bearing shrubs, grasses and forbs. Moderately high- and high-ranking bear habitat is most limited during the early spring, but dramatically increases by late spring. By fall, most of the area covered by this plan provides moderate, moderately-high, or high value habitat. Denning opportunities remain fairly good for this planning unit overall.

Forest harvesting likely increased spring and summer forage for Black-tailed Deer in these watersheds, but it is not known if this led to an actual increase in deer numbers. Wilcon (1997) noted heavy deer use in the lower Tranquil watershed. This planning unit does not contain high winter habitat values, but large areas offer moderate or moderately-high values and therefore provide sufficient habitat during this critical period. At the stand level, high retention levels, rate-of-cut restrictions, and minimum old growth requirements are expected to ensure critical winter habitat and security cover remain, and also to contribute to increased forage production.

Studies indicate that Roosevelt Elk are occasional visitors to the Tofino and Tranquil watersheds (Wilcon, 1997). Historically, two adjacent watersheds – the Kennedy and the Clayoquot – reported regular sightings of small numbers of this blue-listed species. Although the need appears to be low, there is sufficient habitat available in this WPU to provide for a small population. Forest regrowth in formerly-logged hydrosiparian areas will augment the available winter habitat.

1.3 Human Values

Tofino-Tranquil is within the traditional territory of the Tla-o-qui-aht First Nations. Two First Nations Reserves are located within the planning unit: Onadsilth (I.R. 9) is located at the mouth of Tofino Creek at Deer Bay, and Eelseuklis (I.R. 10) is located on the west side of Tranquil Inlet near the mouth of Tranquil Creek. Refer to Map 6 for their locations.

The natural resources of the Tofino-Tranquil Planning Unit provide for the traditional economic, cultural and spiritual activities of the Tla-o-qui-aht First Nations.

Today, as in the past, the harvesting of forest and aquatic resources provides for sustenance, ceremonial and societal needs of the Tla-o-qui-aht First Nations, and helps provide an economic base for the community. First Nations' values are discussed more fully in the 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 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.²

A few archaeological sites have been recorded along the shoreline near the head of Tofino and Tranquil Inlets. All of these sites are of First Nations origin. This information along with other previously recorded

² *Report 5*, p.38

data fills a substantial gap in the archaeological site database for Nuuchah-nulth traditional territory

The Tofino-Tranquil watershed planning unit contains important marine and land-based recreational and tourism features.

The planning unit also contains important recreation and tourism features. Tranquil Creek Provincial Park was identified for protection in the 1993 Clayoquot Sound Land Use Decision. The Park is located at the headwaters of Tranquil Creek and includes steep forested slopes, alpine meadows, and a pristine mountain lake known as Paradise Lake. The total area of the park is approximately 299 ha. Recreation opportunities include hiking, camping and nature appreciation. Access to the Park is by foot from the end of west Tranquil logging road. The Park is not regularly serviced or patrolled. Refer to Map 6 for the location of the Park.

There are other important recreation and tourism features within the planning unit: Virgin Falls (an impressive waterfall about 30 meters high on a tributary to Tofino Creek); smaller waterfalls along Tranquil Creek; and estuaries at the mouth of Tofino Creek and Tranquil Creek. Recreation activities include nature study, sport fishing, scenic and wildlife viewing, hunting, and hiking/backpacking.

This planning unit contains scenic areas visible from the ocean along Tofino Inlet and Tranquil Inlet. Other scenic areas include the lakeshore of Paradise and Synka Lakes as seen from the lakes themselves and the area visible from viewpoints at Virgin Falls.

The land outside the Tranquil Creek Provincial Park and two of the First Nations' reserves falls within Tree Farm Licence 57, which is held by Iisaak Forest Resources. Iisaak Forest Resources is owned by the Central Region First Nations. Refer to Map 6 for the location of TFL 57.

There are eight mineral tenures in the Tranquil Creek watershed.

2.0 The Tofino-Tranquil 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: Principles and Process*.

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 fundamentally critical to the protection of watershed integrity.

The mainstem of Tofino Creek follows a wide, U-shaped valley with many tributaries feeding into it. Tofino Creek itself is a low gradient, boulder-cobble, alluvial stream (A1), which is fed by numerous high gradient, bedrock incised channels (B3b). It is active along many reaches and there is evidence of over-bank flooding along the main stream channel.

The Tranquil River watershed adjoins the Tofino watershed to the west and, like Tofino, follows a wide, U-shaped glaciated valley with a NE-SW trend. It is slightly larger than Tofino, but has the same stream density (2.9 km/km²). Two features set Tranquil apart from most other major watersheds in Clayoquot. One is the wide, alluvial, sandy gravel channel which forms the main stem. Most of the other creeks have a gravel-cobble bed. The second feature, the large lakes found at the headwaters, are likely remnant of valley glaciation and are perched in

stepwise fashion, 300 to 600 m above the main Tranquil stream channel³.

Table 2.1 shows the percent breakdown of streams inventoried within the watershed planning unit by hydroriparian class. By far, the most commonly occurring stream class in both watershed study areas is B3, or non-alluvial channels with steep gradients (greater than 20 percent).

Table 2.1 Percent breakdown of streams in the Tofino - Tranquil Planning Unit by Hydroriparian class.

Watershed Study Area	Alluvial <8% (A1)	Alluvial >8% (A2)	Non-alluvial <8% (B1)	Non-alluvial 8-20% (B2)	Non-alluvial >20% (B3)
Tofino	11.6%	0	1.2%	15.2%	71.9%
Tranquil	12.8%	0	6.4%	9.9%	70.8%

For a detailed description of the hydroriparian inventory assembled in accordance with the Scientific Panel’s classification system, please refer to Volume 1.

Approximately 1,869 ha have been designated as hydroriparian reserves for the Tofino-Tranquil planning unit. This represents approximately 16 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.”⁴ 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.

Madrone Consultants conducted new terrain inventory mapping for the Tranquil area in 1996/97. The firm also updated existing terrain mapping (Terry Rollerson, M.Sc., P.Geo., 1983) to RIC standards for the

³ *Hydroriparian Inventory Year One Final Report*, March 1998, Madrone Consultants Ltd., pg. 26.

⁴ *Report 5*, p.169.

Tofino area in 1996/97 and for the Marble area in 1997/98. All three areas make up the Tofino-Tranquil watershed planning unit.

The terrain in this planning unit is dominated by steep, rocky slopes, many bedrock ridges and bluffs, and numerous gullies. While the steep upper and mid slopes are covered by a discontinuous veneer of colluvium, a mantle of till is found on the moderately steep mid and gentler lower slopes. Fluvial deposits are found within valley bottoms, including well-developed floodplains of the main creeks, and discontinuous floodplains of their tributaries. Glaciofluvial deposits are found as remnants of two former deltas near the mouth of Tofino Creek, and as well sorted deposits in the Tranquil Creek valley. Organic sediments are not common and confined to small, shallow bogs, as well as some occurrences of folisols, which are organic soils consisting of accumulations of leaf litter, twigs and branches over bedrock or thin veneer.

The most common geomorphological processes resulting in transportation and translocation of materials are gully erosion, rock fall and rock slides, debris slides and flows, snow avalanches, as well as sediment movement within irregularly sinuous stream channels.

With respect to road building, potentially unstable (class IV) and unstable terrain (V) is common and occurs throughout the planning unit. Careful planning of road location in order to avoid sensitive slopes, unstable sections of gullies, and vulnerable stream reaches is therefore essential. The area is also considered to have high potential for stream sedimentation. Table 2.2 shows the distribution of potentially unstable terrain classes within the planning unit.

Table 2.2 Percent distribution of potentially unstable terrain classes within the Tofino-Tranquil Watershed Planning Unit⁵

Application	Classification	Tofino Study Area Percent of Polygons	Tranquil Study Area Percent of Polygons	Marble Study Area Percent of Polygons
Cutblocks	III*c	9%	14%	0
	IVc	6%	5%	6%
	Vc	4%	<1%	13%
Roads	IVr	0%	37%	19%
	Vr	3%	10%	30%

Unstable terrain reserves (areas of Class V terrain) cover approximately 1,580 ha. 2,153 ha of the land base are also set aside in sensitive soils

⁵ *Terrain Inventory for the Clayoquot Sound Area, Year Two*, Madrone Consultants Ltd. for BC Ministry of Forests, September 1998. Pg. 221.

reserves. These layers overlap at several locations so, together, unstable terrain reserves and sensitive soils reserves cover 3,398 ha (29 percent) of the total land base of 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.”⁶ 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 Tofino-Tranquil planning unit, one community is red-listed, and one is blue-listed. See Appendix 3 for the Conservation Data Centre’s (CDC) list of red and blue-listed plant communities in Clayoquot Sound.

The red-listed community is Sitka Spruce/Salmonberry Very Wet Maritime (CWHvm1/SS), which covers a total area of 131 ha. Of this, 59 ha (45 percent of that ecosystem) occur in structural stages 6 and 7 (mature and old forest). The remaining CWHvm1/SS in this planning unit is characterized by young Sitka spruce stands (up to 40 years old), which do not exhibit the ecological attributes that warrant protection at this time. Following advice from the CDC the TPC reserves all red-listed communities in structural stages 6 and 7. As a result, the TPC confirmed that 59 ha were captured in the reserve network.

The one blue-listed plant community found in the Tofino-Tranquil planning unit is the Western Red Cedar-Sitka Spruce/Skunk Cabbage (CWHvm1/RC). The TPC was advised to reserve 50 percent of blue-listed plant communities occurring in structural stages 6 and 7. Approximately 32 ha of CWHvm2/RC occur in structural stages 6 or 7, and have been captured by the reserve network.

⁶ Report 5, p.200

The list of rare natural plant communities provided by the CDC includes two yellow-listed communities, Mountain Hemlock-Amabilis Fir/Blueberry (MHmm1/MB) and Western Redcedar-Yellow-Cedar/Skunk Cabbage (CWHvm2/RC), which were given an “apparently secure/vulnerable” ranking. In the Tofino/ Tranquil planning unit, MHmm1/MB is the single most common ecological unit, encompassing 1,961 ha, or just under 17 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. Analysis indicates approximately 51 percent of the MHmm1/MB overlaps with other reserves.

In total, approximately 91 ha (0.8 percent of the land base of the Tofino-Tranquil planning unit) of site series which support red- or blue-listed plant communities have been identified within the reserve network. The locations of the various protected plant communities are shown on Map 10.

Individual rare plants will be reserved at the site level when they are discovered.

Animal Species

The Tofino-Tranquil planning unit contains known nesting habitat for the Marbled Murrelet, a provincially red-listed bird. Maximum dawn Murrelet counts recorded at the mouths of Tofino and Tranquil Creeks range from 116 to 390, and 188 to 347, respectively.

In this planning unit, four murrelet reserves were identified totalling 818 ha or 7 percent of the Tofino-Tranquil watershed planning unit. The location of these reserves is shown on Map 11. These reserves encompass 21 percent of the important murrelet nesting habitat in the planning unit. Additional important habitat is included in reserves for other purposes and in protected areas. In total, approximately 54 percent of all class 1 and 2 Marbled Murrelet nesting habitat has been protected in murrelet reserves, other reserves and protected areas.

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

Other animals that are vulnerable or of particular management concern in Clayoquot Sound include Roosevelt Elk, a blue-listed species. For elk, a blue-listed species, the reserve network captures 2,217 ha (approximately 21.2 percent of the forested area) of moderate, moderately-high and high value winter habitat. This would provide sufficient protection for a small population of over-wintering animals. Suitable habitat for Black Bear and Black-tailed Deer is represented in other reserves and protected areas within the Tofino-Tranquil planning

unit, and 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.

Currently, approximately 7,241 ha or 69 percent of the forested land base of the Tofino-Tranquil planning unit is covered by old growth forests over 141 years old. 5,293 ha or 73 percent of the old growth forest in Tofino-Tranquil is currently in forest-interior condition. The amount of old growth forest, and the amount of old interior forest are currently well above the minimum amount recommended by the Scientific Panel. Please refer to Map 12 showing the current locations of old growth and interior old growth forests in the Tofino-Tranquil planning unit.

3,299 ha of old forest (31.6 percent of the total forested area) is located within provincial parks and within reserves proposed for other values (e.g. hydorrarian, terrain, soils, murrelets, etc.). As a result, in order to satisfy the Scientific Panel recommendation for retention of 40 percent of the forested area as old growth, another 8.4 percent, or 880 ha will have to be retained during harvesting operations.

Recommendation 7.16 of the Scientific Panel 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 10,450 ha. Applying Scientific Panel recommendations, 4,180 ha (40 percent) must therefore be retained as old growth, and a minimum of 836 ha (20 percent) must be forest interior. At this time, 2,352 ha, or 22.5 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 Tofino-Tranquil planning unit.

Approximately 22.5 percent of the forested land base is encompassed in reserves 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.”⁷ Representation of all ecosystems is an essential component of biological diversity.

As shown in Table 2.3, there are two biogeoclimatic zones represented within the Tofino-Tranquil planning unit: the Coastal Western Hemlock zone (CWH) and the Mountain Hemlock zone (MH). The CWH is represented by two subzones, which include three variants: the CWHvh1 - Southern Very Wet Hypermaritime; the CWHvm1 - Submontane Very Wet Maritime; and, the CWHvm2 - Montane Very Wet Maritime. These variants occur below 800 metres. The Mountain Hemlock zone includes two variants: MHmm1 - Moist Maritime Subzone, Windward Variant and MHmmp1, Moist Maritime Parkland. These occur above 800 metres. Refer to map 4 for the biogeoclimatic classification of different areas in this planning unit.

Table 2.3 Biogeoclimatic zones, subzones and variants occurring in the Tofino-Tranquil planning unit

Biogeoclimatic Zone	Subzone	Variant	Location	Total Area
Coastal Western Hemlock (CWH)	Very Wet Hypermaritime (CWHvh)	Southern (CWHvh1)	Coastal	Up to 20 ha
	Very Wet Maritime (CWHvm)	Submontane (CWHvm1)	Below 600 metres.	5,638 ha
		Montane (CWHvm2)	Between 600 metres & 800 metres.	2,359 ha
Mountain Hemlock (MH)	Moist Maritime (MHmm)	Windward (MHmm1)	Above 800 metres near the outer coast	3,228 ha
	Moist Maritime Parkland (MHmmp)	Windward (MHmmp1)		382 ha
Total				approx. 11,629 ha.

There is a TEM data error for one polygon at the mouth of Tofino Creek, which covers approximately 20 ha. This polygon appears to be a brief extension of the CWHvh1 from the adjacent planning unit. As a result of this error, the TPC lacks definitive TEM data for the only CWHvh1 ecosystem in this planning unit.

40 different ecosystem types (site series) are found in the Tofino-Tranquil unit.

There are 40 different naturally-vegetated ecosystem types (site series) occurring in the Tofino-Tranquil planning unit: 17 different site series in the CWHvm1; 14 in the CHWvm2; 5 in MHmm1; and 4 in the MHmmp1. The most commonly occurring forested ecosystems are

⁷ Report 5, p. 171.

Western Hemlock/Amabilis Fir - Blueberry (AB), Mountain Hemlock /Amabilis Fir - Blueberry (MB), Western Hemlock/ Amabilis Fir - Deer fern (HD) and Western Hemlock/Western Redcedar - Salal (HS).

Many of the site series occurring in the Tofino-Tranquil 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 2.4 presents an overview of the occurrence and extent of rare site series within the different variants.

Table 2.4: Rare site series in the Tofino-Tranquil Planning Unit

Variant	Rare Natural Vegetated Site Series			
	#	Area (ha)	% of variant	% of PU
CWHvh1	?	> 20	100	0.16
CWHvm1	12	448.4	7.95	3.86
CWHvm2	11	492.6	20.9	4.23
MHmm1	3	126.2	3.9	1.08
Mhmmp1	4	167.8	44	1.44
All	30	approx 1,250	n/a	10.75

In total, rare site series cover approximately 1,250 ha, or 10.75 percent, of the planning unit.

Once the reserves for all other values were mapped, the TPC determined the degree to which the existing reserve network achieved the recommended ecosystem representation targets. In the Tofino-Tranquil planning unit, 10 ecosystems were found to be underrepresented in the existing reserve network:

- CWHvm1/HD
- CWHvm1/HS
- CWHvm1/LC
- CWHvm1/LS
- CWHvm2/AS
- CWHvm2/HD
- CWHvm2/HS
- CWHvm2/YG
- MHmm1/MO
- MHmm1p/MH

The following site series-dominant tree species-age class groups were also underrepresented:

- CWHvm1/AB/CW/201-400
- CWHvm1/HD/CW/401-600
- CWHvm1/HD/YC/201-400
- CWHvm1/HS/CW/201-400
- CWHvm1/HS/YC/201-400
- CWHvm2/HS/CW/201-400
- CWHvm2/HS/PLC/201-400.

Ecosystem polygons in underrepresented units were added to the reserve network to satisfy all representation requirements. All other ecosystem units were represented in the reserve network, in many cases well above the minimum thresholds.

Approximately 381 ha were added to the reserve network to ensure complete ecosystem representation. Map 14 shows the location of the ecosystem units that were added to the reserve network to ensure full ecosystem representation.

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.”⁸ 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

⁸ Report 5, p. 171

and tourism use.”⁹ 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 recommends that these areas be identified by the Nuu-chah-nulth First Nations and that they be protected in ways that are consistent with traditional knowledge.

Tla-o-qui-aht First Nations Culturally Significant Areas - Mapping and Inventory

The material in this section, including the text and Map 15, was prepared by the Tla-o-qui-aht First Nations.

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

The entire area encompassed by the Onadsilth-Eelseuklis (Tofino-Tranquil) Watershed Planning Unit lies within the traditional territories of the Tla-o-qui-aht First Nations (TFN).

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 Tla-o-qui-aht 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.

Report 3, Recommendation 10:

“Before the completion of any ecosystem planning process in Clayoquot Sound, the Nuu-Chah-Nulth of the area within which the planning is undertaken must be given the opportunity to identify, locate, and evaluate culturally important sites and areas.”

⁹ Report 5, p. 37

Report 3, Recommendation 15:

“Planning inventories undertaken in Clayoquot Sound for ecosystem management must be done in full consultation with and full participation of the Nuu-Chah-Nulth of Clayoquot Sound. Nuu-Chah-Nulth cultural resources and culturally important areas must be incorporated in planning inventories before completion of the planning process.”

Report 5, Recommendation 7.16:

“At the watershed level, map and designate reserves in which no harvesting will occur to protect key hydrosiparian 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 important 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 hydroriparian reserve width plus an additional 30%. It is extremely important to provide protection for water resources because the TFN 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 5,434 ha, or 47 percent of the planning unit, have been identified by the Tla-o-qui-aht First Nations to be of high or moderate cultural significance. These areas include the entire hydroriparian reserve width and a 30 percent buffer. Any area located outside an area of high or moderate classification is considered to be of low significance. 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.”¹⁰ Accordingly, the Panel identified the protection of scenic values as one component of the ecosystem management theme of maintaining human values.

In the Tofino-Tranquil 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 values have been preserved within existing parks and reserves for other values. Scenic values located within the harvestable areas in the Tofino-Tranquil planning unit are maintained through management criteria designed to achieve scenic class objectives and standards (see Volume 1 for these management criteria).

Table 2.5 presents the breakdown of area within each scenic class in the visible portion of the Tofino-Tranquil planning unit, both within reserves and within the harvestable area.

¹⁰ Report 5, p. 40

Table 2.5 Tofino-Tranquil - scenic classes by area

Scenic Class	Reserves	Harvestable Area	Total Ha*
Natural - Appearing	799	609	1,406
Minimal Alteration	769	773	1,542
Small-Scale Alteration	607	509	1,141
TOTAL	2,175	1,891	4,101*

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

Areas comprising 35 percent of the Tofino-Tranquil unit have been assigned scenic class objectives.

In total, 4,101 ha or 35 percent of the planning unit have been assigned scenic class objectives. Of these, 2,175 ha (almost 53 percent) are located within parks and reserves.

The portion of scenic area in Tofino-Tranquil 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, and 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 in the Tofino-Tranquil planning unit.

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.

Tranquil Creek Provincial Park occupies 299 ha of alpine meadow and steep forested slopes around Paradise Lake, at the top end of the main tributary to Tranquil Creek. This park, which was identified for protection in the 1993 Clayoquot Sound Land Use Decision, surrounds a scenic, pristine lake and offers remote wilderness recreational opportunities

Important recreation and tourism features in this planning unit outside the provincial park include scenic Virgin Falls in the Tofino Creek watershed; numerous small lakes in both watersheds; and – as a result

of logging road access – numerous opportunities for mountain biking, backcountry tourism and wildlife viewing.

In addition to the areas that fall within the scenic classes and within reserves for other purposes, such as hydroriparian reserves, approximately 82 ha containing features of high to very high recreation significance have been reserved. These areas are located primarily around lakes, marine shores and Virgin Falls. This represents 0.7 percent of the total land base of the Tofino-Tranquil planning unit. This reserve layer overlaps almost entirely with the hydroriparian reserve layer. Please refer to map 17 for locations of recreation and tourism reserves

2.4 Summary: The Tofino-Tranquil Watershed Reserve Network

The watershed reserves identified for the Tofino-Tranquil 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 Tofino-Tranquil planning unit are reserves in a strict sense; that is, forest harvesting is prohibited under normal circumstances (exceptions to this prohibition are described in Section 2.5 of Volume 1). These include:

- 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.

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, Chapter 3 describes management criteria for special management zones.

A total of 50 percent of the Tofino-Tranquil planning unit has been reserved.

Map 18 shows all the reserves in the Tofino-Tranquil planning unit. A total of 5,768 ha or 50 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 Tofino-Tranquil Watershed Planning Unit

3.1 Management Criteria for Special Management Zones

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

The areas in the Tofino-Tranquil 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 hydroriparian 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

Special conditions, considerations and procedures apply in special management zones to ensure that sensitive values are maintained.

Approximately 47 percent of the area of the Tofino-Tranquil planning unit, plus some hydroriparian areas and buffers, have been identified by the Tla-o-qui-aht First Nations as areas bearing high or moderately-high cultural significance. Consistent with traditional knowledge, culturally important areas are not designated as “reserves”. Rather, the designation “culturally significant” indicates that the Tla-o-qui-aht consultation process must be engaged in order to initiate any development proposals (please refer to Section 3.3.1 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 the special conditions, considerations and procedures to be met and followed should the development proceed.

Scenic Areas

Lands representing approximately 35 percent of the planning unit have been classed as scenic areas. 53 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

Marine and 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 reserves. In the Tofino-Tranquil planning unit, the management zones for recreation and tourism amount to 617 ha. Of this, 496 ha overlaps with the reserve layer, 112 ha occurs within the harvestable areas, and a small area occurs outside these layers. Map 17 shows the locations of these management zones. 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 recommends 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 protection for many species 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 such species 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 reserve 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 Tofino-Tranquil 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.

Volume 1 describes the methodology used to assign rate-of-cut limits in Clayoquot Sound. Map 21 shows the individual watersheds for this planning unit.

Table 3.1: Rate-of-Cut Limits for Watersheds in the Tofino-Tranquil Planning Unit

Watershed or Map Unit	WS ID	Watershed Type	Area (ha)	Does rate-of-cut Rule Apply?	5 Year Cut (ha)	10 Year Cut (ha)
10	1118	Primary Watershed, <200 ha	198	No	No limit	No limit
11 Total		Primary Watershed, >500 ha	5,870	Yes	293.5	-
11	1090	Primary - residual area	2,125	No	-	-
11.1	913	Secondary Watershed, >500 ha	1,451	Yes	72.5	-
11.2	911	Secondary Watershed, >500 ha	2,295	Yes	114.7	-
200	1139	Not a watershed - face unit	24	No	-	-
200	1468	Not a watershed - face unit	130	No	-	-
8	1188	Primary Watershed, >500 ha	729	Yes	36.4	-
9 Total		Primary Watershed, >500 ha	4,503	Yes	225.1	-
9	991	Primary - residual area	2,107	No	-	-
9.1	1011	Secondary Watershed, >500 ha	735	Yes	36.7	-
9.2	1101	Secondary Watershed, <=500 ha	379	No	-	-
9.3	995	Secondary Watershed, >500 ha	683	Yes	34.2	-
9.4	944	Secondary Watershed, >500 ha	598	Yes	29.9	-

The Ministry of Forests and Range will verify that forest development is 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.

The following restoration activities were reported as complete at the end of 2004: 49.9 km of permanent and 8.3 km of semi-permanent road deactivation and 200 ha of riparian restoration.

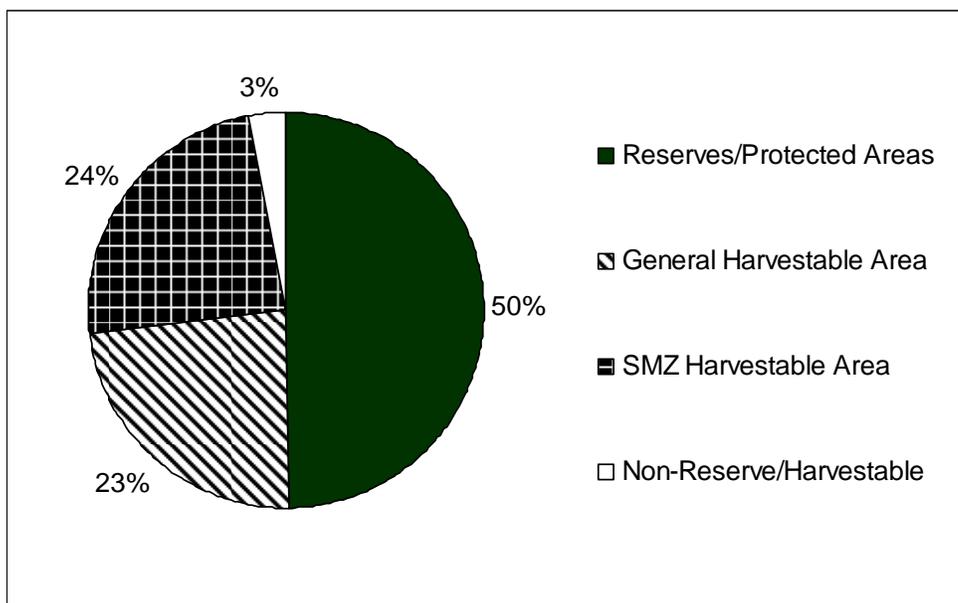
3.6 Summary: Harvestable Area in the Tofino-Tranquil Watershed Planning Unit

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 5,521 ha, or 46 percent of the Tofino-Tranquil watershed planning unit has been designated as harvestable area. The remainder is in reserves.

Special Management Zones comprise approximately 2,792 ha or 51 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 3.2 shows the proportion of designated reserves, Special Management Zones and general harvestable area (i.e., without special management zone designation) in the Tofino-Tranquil planning unit.

Figure 3.2 Reserves and Harvestable Area in the Tofino-Tranquil 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, Nuu-Chah-Nulth Tribal Council
Central Region Chiefs

Rudi Maysner, 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

Doug Fetherston, GIS Analyst, ILMB, MAL

Anette Thingsted, Planning Officer, ILMB, MAL

Lindsay Jones, Manager Representative, ILMB, MAL

Appendix 2: Tofino - Tranquil Fish and Fish Habitat Inventory

The information in this Appendix was derived from a 1999 report prepared for the Ministry of Environment, Lands and Parks by the Nuu-chah-nulth Tribal Council.¹¹

Tofino Creek

Tofino Creek fish stocks are wild; that is, they have not been modified by hatchery introductions. Not all reaches within this watershed have been surveyed but, generally, several factors contribute to low fisheries productivity: cool water temperatures, low alkalinity values, and low invertebrate productivity.

Fish Species

Resident game species: Rainbow Trout, Dolly Varden Char.

Anadromous game species: Chum, Coho, winter-run Steelhead, summer-run Steelhead, possibly Dolly Varden Char.

Anadromous game species extirpated: Chinook.

Other species: Prickly Sculpins, other coastal sculpins.

Habitat Values

Mainstem Reach 1: important estuary habitat for juvenile salmonids.

Mainstem Reaches 2 to 3: limited salmonid spawning habitat and very little off-channel habitat; cascade restricts upstream access to salmonids except Dolly Varden Char and Steelhead; excellent Rainbow Trout rearing habitat.

Mainstem Reaches 4 to 8: accessible to anadromous Dolly Varden Char and Steelhead; lower reaches have moderate rearing habitat for Rainbow; upper reaches have excellent spawning and rearing habitat for DV Char and Rainbow Trout.

¹¹ Lewis, Bronwen. Interpretive Maps of Fish Habitat and Distribution in the Tofino-Tranquil Watershed Group. Unpublished report prepared for the Ministry of Environment, Lands and Parks by the Nuu-chah-nulth Tribal Council. Port Alberni. October 1999.

Mainstem Reaches 9 to headwaters: excellent spawning and rearing habitat for resident species; however, no fish were observed.

Lower Tributaries: Rainbow Trout and Coho fry present; at least one tributary has good rearing habitat for salmonids; due to logging, sections have lost riparian habitat including sources for large woody debris recruitment.

Upper Tributaries: most lack suitable fisheries habitat; many require rehabilitation work to reduce sediment loading; Rainbow Trout recorded from a single tributary.

Biodiversity Values

The summer-run Steelhead population is one of the few verified for Clayoquot Sound. The summer-run Steelhead, the winter-run Steelhead and the Dolly Varden populations are of regional significance because of declining numbers throughout their ranges, and their sensitivity to disturbance. Dolly Varden Char are a blue-listed species.

Restoration Opportunities

Some restoration (including culvert removal and replacement, riffle area construction and LWD placement) undertaken by MacMillan Bloedel, the Nuu-chah-nulth Tribal Council and Fisheries Renewal BC in 1998 and 1999 in the lower portions of watershed. Riparian and gully restoration required to limit sediment sources on tributaries which experience torrent conditions. Riparian rehabilitation and LWD placement required throughout lower reaches of mainstem.

Tranquil Creek

Previous logging in the lower half of this watershed has impacted fish habitat. The Tofino Salmon Enhancement Society supplements native populations with hatchery-reared Coho and Chinook fry. Rainbow Trout introduced at least once, into Paradise Lake. Fish habitat varies widely, ranging from low gradient gravel-bedded streams to high gradient boulder/cobble streams.

Fish Species

Resident wild species: Dolly Varden Char.

Anadromous wild species: Chinook, Chum, Coho, winter-run Steelhead.

Other species: Prickly Sculpins, other coastal sculpins.

Introduced species: Rainbow Trout, Chinook, Coho.

Habitat Values

Mainstem Reach 1: important estuary habitat for juvenile salmonids.

Mainstem Reaches 2 to 8: very little off-channel habitat, salmonid spawning habitat available; access to upper reaches restricted by two large falls.

Mainstem Reaches 10 to 16: loss of riparian habitat contributing to bank instability and lack of LWD; DV Char present; excellent rearing habitat for DV.

Mainstem Reaches 17 to headwaters: steep terrain; adult fish recorded from inlet of highest lake (Pitka Lake); excellent spawning and rearing habitat for resident salmonids; cool temperatures and limited food availability may limit fish distribution.

Main Tributary, Reach 1: low gradient; excellent fish habitat; accessible to fish; DV Char rearing habitat.

Main Tributary, Reach 2: high gradient canyon.

Main Tributary, Reaches 3 to headwaters: loss of riparian habitat in many areas; potential DV Char habitat; Paradise Lake stocked with trout.

Other Tributaries: loss of riparian habitat in many areas; general lack of suitable fish habitat.

Biodiversity Values

The winter-run Steelhead and the Dolly Varden populations are of regional significance because of declining numbers throughout their ranges, and their sensitivity to disturbance. Dolly Varden Char are a blue-listed species.

Restoration Opportunities

Restoration activities unknown in 1998 and 1999.

Riparian rehabilitation and LWD placement required at several locations.

Appendix 3: Red- and Blue-listed Plant Communities in Clayoquot Sound*

Rare Plant Communities	Rank	Associated Ecosystem Units		
		BEC unit	Site Series	
			Number	Symbol
Red-Listed				
<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]
Blue-Listed				
<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 oregonum</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]
Yellow-Listed				
<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 Tofino - Tranquil 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

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