BIOSPHERE RESERVE NOMINATION

PART I: SUMMARY

1. PROPOSED NAME OF THE BIOSPHERE RESERVE:

CLAYOQUOT SOUND BIOSPHERE RESERVE

2. COUNTRY:

CANADA

3. FULFILMENT OF THE THREE FUNCTIONS OF BIOSPHERE RESERVES:

The Clayoquot Sound Biosphere Reserve, totalling approximately 349,947 hectares, will address the Statutory Framework's three functions of conservation, development and logistic support in the following manner:

3.1 "Conservation - contribute to the conservation of landscapes, ecosystems, species and genetic variation."

Existing parks and protected areas within the core area conserve a wide range of habitats and landscapes, covering approximately 90,412 hectares in the terrestrial component (34% of terrestrial area of 265,705 hectares) and 19,869 hectares in the marine component (24% of marine area of 84,242 hectares). The terrestrial core areas include tracts of some of the last remaining intact coastal temperate rainforest left on the North American continent. Core areas include Pacific Rim National Park Reserve and sixteen provincial parks and ecological reserves. Adjustments to core areas may occur through treaty negotiations and the outcome of community-based land and resource use planning processes. A variety of legislative, regulatory and management mechanisms are in place to ensure the protection and conservation of landscapes, ecosystems and biodiversity within both the marine and terrestrial components of the Reserve. In the core protected areas, these mechanisms include federal legislation (e.g., National Parks Act, Fisheries Act, Oceans Act, and Environmental Protection Act), provincial legislation (e.g., Park Act, Ecological Reserve Act and Wildlife Act) and management plans (see appendices). Buffer and transition zones are also managed to promote biodiversity and conservation under a wide range of statutes and management plans.

3.2 "Development - foster economic and human development which is socio-culturally and ecologically sustainable."

The transition and buffer areas provide diverse opportunities for sustainable economic and human development -- indeed, innovations are now underway as local communities shift from a primary dependence on logging and fishing to a more balanced and diversified regional economy that also includes tourism, aquaculture and value added manufacturing of marine and forest products. All of the current economic planning and resource management processes in the region are being led by, or directly involve, local First Nations and non-aboriginal communities.

The marine component of the Reserve is managed to ensure that development, fisheries and resource uses -- including tourism -- occur within the context of sustainability and conservation through a wide range of statutes and management plans. Current forest development planning in the Reserve is conducted under the recommendations of the *Scientific Panel for Sustainable Forest Practices in Clayoquot Sound* (1995), which are based on principles of conservative and adaptive management, recognizing the precautionary principle; full consideration of ecosystem health is a prerequisite to logging. Implementation of the Panel recommendations is being undertaken by the Clayoquot Sound Central Region Board and the Clayoquot Planning Committee, both of which are community-based bodies, along with government agencies and logging companies. The Nuu-chah-nulth Central Region First Nations are currently seeking a transfer of the largest forest tenure in the region to Iisaak Forest Resources, a forest company in which they are 51% owners; it is anticipated that Iisaak forest operations will be certified under Forest Stewardship Council standards and will also be certified by First Nations. Other community organizations and businesses are also actively seeking access to, or ownership of, forest and other tenures, including a joint proposal from the District of Ucluelet, Ma-Mook Development Corporation (a First Nation body) and the Long Beach Model Forest for a community forest south of the Reserve. (See Appendix K for a list of local agencies, panels and organizations cited in text.)

3.3 "Logistic support - support for demonstration projects, environmental education and training, research and monitoring related to local, regional, national and global issues of conservation and sustainable development."

A locally based foundation -- the *Clayoquot Biosphere Trust* -- is being established to administer the affairs of the Reserve in relation to logistics support, to provide a local point of contact for the World Network of

Biosphere Reserves and for international researchers, and to coordinate and fund community-based research, education and training in the region. Until the Trust is established, the local Clayoquot Sound UNESCO Biosphere Nomination Working Group (the group of First Nations and community government leaders that developed this nomination in cooperation with federal and provincial agencies) will coordinate Biosphere initiatives. In addition, significant research, inventory and monitoring activity is ongoing in the area under the sponsorship of the British Columbia government, the government of Canada, the Long Beach Model Forest, Management for a Living Hesquiaht Harbour, the Clayoquot Biosphere Project (a research organization that is not affiliated with the UNESCO Biosphere initiative or the Clayoquot Sound UNESCO Biosphere Nomination Working Group), Strawberry Isle Research Society, private academic institutions, and a variety of local and external researchers. There is an existing research infrastructure in the region, including field stations, offices, laboratories, classrooms and transportation facilities. New facilities are planned in a number of local communities and in the National Park Reserve.

4. CRITERIA FOR DESIGNATION AS A BIOSPHERE RESERVE:

4.1 "Encompass a mosaic of ecological systems representative of major biogeographic regions, including a gradation of human intervention." (high, med. or low)

High - The Biosphere Reserve is situated in the coastal temperate rainforest on the west coast of North America and in the northeast Pacific Ocean coastal environment. A diverse range of ecosystems exist within the Reserve boundaries; these ecosystems include significant expanses of unlogged temperate rainforest, large and small lakes, many rivers and streams, alpine peaks, open ocean, rocky coastal shores, long sand beaches, estuaries and mud flats. Nine of the Reserve's large forested valleys (each over 1000 hectares) remain untouched by logging or other industrial development; the Megin River valley, a core protected area, alone encompasses 21,300 hectares. Given continued development in temperate rainforests worldwide, these areas are of global ecological significance. Some watersheds in the Reserve have been extensively logged in the past fifty years, and others have been subject to varying types and degrees of human activity. All forest lands and marine areas are now managed under strict guidelines to maintain ecosystem integrity and health. The Reserve includes five small coastal communities; several other small communities are located immediately adjacent to the Reserve.

4.2 "Be of significance for biological diversity conservation." (high, med. or low)

High - The marine and terrestrial components of the Reserve, including protected core areas and other zones, provide habitat for a vast array of species, a significant number of which are endangered or rare. The Reserve provides vital feeding, breeding and staging habitat for resident, migrating and transient populations of birds, marine mammals, fish, terrestrial mammals and other species. Given that development is increasingly resulting in fragmentation of forest and alpine ecosystems and the loss of biological diversity in coastal rainforests, the Reserve will provide a refuge and centre for natural dispersion and re-establishment of species. It will also constitute a significant source of information on biological diversity and processes.

4.3 "Provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale." (high, med. or low)

High - Some of the most exciting developments in sustainable resource use and management found anywhere in North America are taking place within the Reserve. First Nations and local communities are integrally involved in all resource planning and management initiatives in the region. Forest management occurs within the context of the most stringent government-sponsored guidelines in Canada, under the guidance of a joint First Nation-local community and government management board; ongoing ecosystem health is the primary consideration in all development decisions. Research and study opportunities are attracting scientists and students from around the world to conduct work in the Reserve. New vehicles for ownership of local resources and resource tenures to promote sustainability are currently being developed by First Nations and other local communities.

4.4 "Have an appropriate size to serve the three functions of biosphere reserves."

Yes - The Reserve, totalling 349,947 hectares, is of sufficient size to serve conservation, development and logistics support functions; indeed, the combination of rich natural environments, many of which are protected, ongoing and new sustainable development innovations, and existing and planned infrastructure provide opportunities to combine biosphere functions in unique ways and to support a wide array of research initiatives and study programs. The Reserve is of appropriate size to ensure effectiveness and coordination of management and monitoring initiatives.

4.5 "Does the proposed biosphere reserve have:

a) a legally constituted core area or areas devoted to long term protection, according to the conservation objectives of the biosphere reserve, and of sufficient size to meet these objectives?

Yes - One National Park Reserve (pending legislation) and sixteen provincial parks and two ecological reserves are within the Reserve boundaries, providing permanent legal protection as core areas. Core protected areas in both the marine and terrestrial components constitute approximately one third of the Reserve (110,281 hectares).

b) a buffer zone or zones clearly identified and surrounding or contiguous to the core area or areas, where only activities compatible with the conservation objectives can take place?

Yes - Terrestrial buffer zones include all unprotected, unlogged major valleys in the Reserve, totalling approximately 58,316 hectares. These areas are subject to forest planning that may lead to further refinements in the application of the zonation model, including the establishment of further transition areas. The Province's 1993 Land Use Decision included land use categories equivalent to buffer zones ("special management zones"). The Tofino Mudflats Wildlife Management Area, comprising 2100 hectares in marine and upland components, is also designated as a buffer zone; it is managed to ensure that the area remains a productive natural environment for migrating birds and other wildlife while providing for compatible public use (such as transportation and tourism).

c) an outer transition area where sustainable resource management practices are promoted and developed?"

Yes - In over 179,250 hectares of transition area -- private and public land and marine areas -- sustainable resource management practices guide ongoing development activities and initiatives. These areas are also subject to ongoing forest planning that may lead to further refinements in the application of the zonation model, including the establishment of further buffer zones.

4.6 "Organizational arrangements should be provided for the involvement and participation of a suitable range of *inter alia* public authorities, local communities and private interests in the design and carrying out of the functions of a biosphere reserve."

Yes, and planned - First Nations, local communities, private parties, and senior levels of governments all have defined roles and responsibilities in management, planning, research, inventory and monitoring initiatives in the Biosphere Reserve. Regional bodies are assuming greater roles in management of resources, and a number of local organizations such as the Long Beach Model Forest have taken on significant initiatives to promote research, education and monitoring. Formal links between the *Clayoquot Biosphere Trust* and other relevant authorities and organizations will be established as the Trust becomes operational (anticipated in June of 1999).

4.7 "Mechanisms for implementation; does the proposed biosphere reserve have:

a) mechanisms to manage human use and activities in the buffer zones?

Yes, and planned - Ongoing planning initiatives under the sponsorship of the provincial government, First Nations and local communities will further define terrestrial and marine buffer zones and determine appropriate activities within these areas. The provincial Ministry of Environment, Lands and Parks has primary management responsibilities for the Tofino Mudflats Wildlife Management Area, to ensure the protection of habitat, as defined in the provincial Wildlife Act.

b) a management plan or policy for the area as a biosphere reserve?

Yes, and planned - A mosaic of approved plans, policies and processes form the basis for management within the Biosphere Reserve, with the Clayoquot Sound UNESCO Biosphere Reserve Charter serving as an encompassing policy statement on the Biosphere Reserve. Current and new planning efforts and treaty negotiations will lead to further refinements of plans and policies. Major policy statements and plans include management plans of individual First Nations, the provincial government's Clayoquot Sound Land Use Decision, the Interim Measures Extension Agreement, treaty negotiations and agreements, national and provincial park management plans, the recommendations of the *Scientific Panel for Sustainable Forest Practices in Clayoquot Sound*, and plans currently being developed to guide logging and other resource extraction activities. These documents, or summaries, are appended.

c) a designated authority or mechanism to implement this policy or plan?

Yes, and planned - The *Clayoquot Biosphere Trust* will provide logistics support and coordination functions relating to the activities of a number of

different research, education and training organizations. It will be the central administrative body for the Reserve, but it will not serve as a resource management body itself. A number of specific authorities and mechanisms are currently implementing plan or policy components within their sanctioned spheres of responsibility. In addition to federal and provincial agencies with ongoing statutory responsibilities for specific issues in the Reserve and rights associated with aboriginal title, new or interim regional authorities, such as the Clayoquot Sound Central Region Board, are in place or are under discussion at the treaty negotiation table.

d) programmes for research, monitoring, education and training?"

Yes - Significant research, monitoring, education and training initiatives are already underway in the Biosphere Reserve, through the sponsorship of government agencies, the Clayoquot Sound Planning Committee, other regional bodies, the Long Beach Model Forest, other local organizations and external researchers. The *Clayoquot Biosphere Trust* will support new community-based initiatives and partnerships with external institutions to promote research, education and training consistent with Biosphere functions and themes.

5. ENDORSEMENTS:

5.1 Signed by the provincial authority responsible for management of the core and buffer areas:

Signature: Cathy McGregor

Full Name: CATHY MCGREGOR

Title: Minister of Environment, Lands & Parks

Government of British Columbia - Ministry of Environment, Lands and Parks

Date: Jan 28/99

Signature: L. Ped

Full Name: Larry Pedersen

Title: Chief Forester (Acting Deputy Minister)

Government of British Columbia - Ministry of Forests

Date: Jan 28/99

5.2 Signed by the national authorities responsible for management of the core and buffer areas:

Signature: J. Barlow

Full Name: JAMES C. BARLOW

Title: Field Unit Superintendent

Government of Canada - Heritage Canada/Parks Canada

Date: January 28/99

Signature: D. Petrachenko

Full Name: DONNA M PETRACHENKO

Title: REGIONAL DIRECTOR GENERAL

Government of Canada - Department of Fisheries and Oceans

Date: January 28, 1999.

5.3 Signed by the authorities of Nuu-chah-nulth Central Region First Nations:

Signature: _____

Full Name: Angus Campbell

Title: Chief councillor

Ahousaht First Nations

Date: Jan 27 99

Signature: _____

Full Name: CECIL SABBAS

Title: CHIEF COUNCILLOR

Hesquiaht First Nation

Date: Jan. 27 1999

Signature: _____

Full Name: Moses MARTIN

Title: Chief Councillor

Tla-o-qui-aht First Nation

Date: JAN 27/99

Signature: _____

Full Name: _____

Title: Chief

Toquaht First Nation

Date: JAN. 27/99.

Signature: L D Baird

Full Name: LAURENCE D BAIRD

Title: CHIEF COUNCILLOR/UCLUELET FIRST NATION

Ucluelet First Nation

Date: Jan 28 1999

Signature: Nelson Keitlah

Full Name: Nelson Keitlah

Title: Chairman - Central Chiefs

Nuu-chah-nulth Tribal Council, Central Region

Date: Jan 28 1999

5.4 Signed by the local government authorities from communities located in or adjacent to the transition area:

Signature: _____

Full Name: Scott Kenneth Fraser

Title: Mayor

District of Tofino

Date: January 28/99

Signature: _____

Full Name: William Edward Irving

Title: Mayor

District of Ucluelet

Date: Jan 28/99

Signature: G. Swann

Full Name: G. Swann

Title: Chairperson

Alberni-Clayoquot Regional District

Date: Jan 28, 1999

5.5 Signed on behalf of the Canadian National Committee for the UNESCO Man and Biosphere Programme:

Signature: _____

Full Name: _____

Title: _____

Canada MAB

Date: _____

PART II: DESCRIPTION

6. LATITUDE AND LONGITUDE OF AREA (see location map):

The northern extent of the Reserve is approximately 49° 35' N.
The southern extent of the Reserve is approximately 49° 0' N.
The western extent of the Reserve is approximately 126° 35' W.
The eastern extent of the Reserve is approximately 125° 25' W.

7. SIZE AND SPATIAL CONFIGURATION (see zonation and protected area maps):

The size and spatial configuration of the Reserve are outlined below and in appended maps. Fine lines within the terrestrial component of the zonation map denote small watersheds, often within larger valleys or drainages.

7.1 Core Areas and Size (in hectares):

Terrestrial core area -- comprised of 17 distinct units (parks and ecological reserves)	90,412
Marine core area -- comprised of 10 distinct units (parks and ecological reserves)	19,869
Total	110,281

7.2 Buffer Zones and Size:

Terrestrial Buffer Zone Components (in hectares)

All major unprotected watersheds in which little (less than 2% of area) or no logging or other industrial activity has taken place	58,316

Detailed plans for these areas are being developed through ongoing community-based planning and inventory initiatives. These plans will lead to refinements and possible adjustments in the application of the zonation model in these watersheds, including the potential establishment of transition zones, core areas or non-legislated buffer zones (e.g., hydroriparian reserves).

Upland component of Tofino Mudflats Wildlife Management Area	420

Marine Buffer Zone Components (in hectares)

Intertidal component of Tofino Mudflats Wildlife Management Area	1680

Further marine buffer zones could be established through future planning processes.

Total Buffer Zones	60,416

7.3 Transition Zones and Size:

Terrestrial Transition Zone Components (in hectares)

All First Nation communities and municipalities, Indian Reserves, private land outside of municipal boundaries, lakes, islands and major watersheds in which significant logging or other industrial activity has taken place	116,557

Detailed plans for major watersheds in transition areas are being developed through ongoing community-based planning and inventory initiatives. These plans will lead to refinements and possible adjustments in the application of the zonation model in these watersheds, including the potential establishment of non-legislated buffer zones (e.g., hydroriparian reserves), core areas or more specific transition zones.

Marine Transition Zone Components (in hectares)

All non-core and non-buffer marine areas	62,693
Total Transition Zones	179,250

7.4 Rationale

The zonation framework is based upon key elements of the provincial government's Clayoquot Sound Land Use Decision (April 1993). First Nations have not endorsed the Land Use Decision, however, and the land and resource use designations outlined in the decision are subject to further agreements on ownership, jurisdiction and resource uses through treaty negotiations and in established and anticipated planning processes. This zonation is intended as a dynamic, descriptive overlay to indicate the current state of actual land, water and resource use designations in the area, consistent with established local,

provincial and national authorities. It is not intended to confer new or binding land or resource designations and it will not affect the authority or jurisdictions of First Nations, local governments, the province or the federal government. Following the Clayoquot Sound Land Use Decision, a number of new protected core areas (totalling an additional 48,500 hectares) were established in the Reserve area, in addition to existing provincial parks and the Pacific Rim National Park Reserve. The decision also created zoning and management categories that are consistent with buffer zones ("special management zones") and transition areas. The marine transition zone includes an ecologically and commercially important coastal marine zone between the seaward limits of park marine components at the northern and southern extremes of the Reserve.

7.5 Exclusions:

Meares Island

Meares Island (8305 hectares), located in the south-central area of the Reserve, is under a court injunction prohibiting logging activity pending the outcome of treaty negotiations. It was not included in the Province's Land Use Decision and is not subject to current forest planning initiatives.

8. BIOGEOGRAPHICAL REGION:

UNESCO/MAB:

Subtropical and Temperate Rainforest (UNESCO)

Sitkan Biogeographical Province (code 1.1.2 - Udvardy) and Columbian Coastal Biotic Province (Ray)

National:

Pacific Maritime Ecozone and Western Vancouver Island Ecoregion (Environment Canada)

Provincial:

Coastal Western Hemlock Biogeoclimatic Zone (Meidinger and Pojar)

9. LAND USE HISTORY:

Nuu-chah-nulth people have lived in Clayoquot Sound for millennia. The indigenous culture of the Nuu-chah-nulth -- including rich political, social, technological and artistic elements -- is linked inextricably to the marine and terrestrial resources of the region, and is centred on the unique relationships between Nuu-chah-nulth people and the natural environment. The Nuu-chah-nulth have always lived at the edge of the sea, and have used abundant salmon, sea mammal and other marine resources of the area in a sustainable fashion. The extensive use of Western Red Cedar by the Nuu-chah-nulth is widely known, but countless other species of terrestrial plants and animals have been used by the Nuu-chah-nulth for food, medical, spiritual and technological purposes.

Hishuk ish tw'awalk, or "everything is one," is the Nuu-chah-nulth concept that describes fundamental relationships in the environment. It connotes both the sacredness of the natural world and respect for all life. It is also the foundation for Nuu-chah-nulth principles of resource management and stewardship. These principles have shaped Nuu-chah-nulth land and resource use practices for centuries, and they continue to guide management decisions in the area today. Nuu-chah-nulth traditional ecological knowledge is an integral component of research and management initiatives in the Reserve. The traditional Nuu-chah-nulth system of land and resource stewardship -- *hahuulhi* -- provides a detailed history of ownership and resource uses in the region. It too provides a foundation for resource management in the area, and a focus for current negotiations on land and resource ownership at the treaty table with Canada and British Columbia.

European explorers arrived at Clayoquot Sound in the latter part of the eighteenth century, and in the following one hundred years a growing number of traders and church missionaries visited the area. By the late nineteenth century, a permanent non-indigenous presence was established in Clayoquot, first on islands in the Sound and then at the present site of Tofino. This coincided with a growing commercial interest in the wood and mineral resources of the area and with expanding exploitation of marine resources. Pre-emptions of land by new non-indigenous residents began in the late 1800s. During the early years of the current century commercial fishing and processing emerged as significant economic activities in the area.

Large scale industrial logging in the area commenced over fifty years ago, although small logging enterprises had previously operated in the Sound for a number of decades. The aquaculture industry -- both finfish and oyster culture -- is an important commercial user of foreshore throughout the Sound. Over the past one hundred years, several mines have operated in the region; none are operational now. During the Second World War, military infrastructure was introduced in the region, including the existing airport (no longer under military jurisdiction).

The road connecting the region to the more heavily populated east coast of Vancouver Island was finished in 1959. This resulted in growing numbers of tourists visiting the area, primarily to enjoy the vast expanses of sandy ocean beaches between Tofino and Ucluelet. As tourism interest increased, so did awareness of the natural beauty and environmental importance of the area; in recognition of these factors, provincial lands were transferred to the Government of Canada in 1971 to establish Pacific Rim National Park Reserve. Tourism continues to grow in the area, and use of the more remote areas of the region by eco-tourism operators and recreational users is increasing.

10. HUMAN POPULATION OF PROPOSED BIOSPHERE RESERVE:

The permanent population of the Reserve region is less than 5,000, although numbers swell significantly with summer tourists and seasonal workers. The resident population is roughly half Nuu-chah-nulth and half of non-aboriginal descent.

10.1	Core Areas	0 (permanent)	10 (est.) (seasonal)

There are no known permanent residents in core protected areas. First Nations residents and federal and provincial parks staff use core areas on a seasonal or temporary basis, as do scientists and researchers. Large numbers of short term visitors to the Biosphere region camp in designated areas in national and in provincial parks.

10.2	Buffer Zones	0 (permanent)	25 (est.) (seasonal)

There are no known permanent residents in buffer zones. First Nations residents, government staff, scientists, researchers and recreational visitors reside in buffer zones on a seasonal or temporary basis.

10.3	Transition Areas	2284 ('96 Census) (permanent)	400 (est.) (seasonal)

One town and a number of First Nations communities are located in the transition areas of the Reserve. The population counts for these communities from the 1996 national census are:

Ahousaht (First Nation)	742
Esowista (First Nation)	125
Hot Springs/Hesquiaht (First Nation)	96
Opitsat (First Nation)	151
Tofino (District Municipality)	1170
Long Beach (Regional District, estimate)	75
Total	2,359

In addition to local First Nation residents accounted for in these census figures, approximately 50% of First Nations members reside in other communities in the region. Small numbers of people reside in transition zones outside of established community boundaries (see estimates under Long Beach above).

Communities immediately adjacent to the Reserve include:

Ittatsoo (First Nation)	191
Macoah (First Nation)	13
Ucluelet (District Municipality)	1660
Long Beach (Regional District, estimate)	425
Total	2,289

10.4 Brief description of local communities within or near the proposed Biosphere Reserve (see principal settlements map):

Three Nuu-chah-nulth First Nations groups -- the Ahousaht, Hesquiaht and Tla-o-qui-aht -- hold traditional territory mostly or fully within the Reserve boundaries. An additional two First Nations groups -- the Toquaht and Ucluelet -- occupy traditional territory immediately south of the Reserve (apart from a small portion of Ucluelet territory within Reserve boundaries). Together, these five First Nations form the Central Region component of the Nuu-chah-nulth Tribal Council, the main political body of the Nuu-chah-nulth. Within the Biosphere Reserve boundaries there are approximately forty small "Indian Reserves" (held in trust by the Government of Canada under the federal Indian Act). These total 1,055 hectares in size, and include the community sites of Ahousaht (or Marktosis), Hesquiaht, Hot Springs Cove, Opitsat and Esowista.

In addition to ongoing traditional resource uses and practices, the economies of Nuu-chah-nulth communities have focused on fishing, and to a lesser extent logging, over the past several decades. Declining fish stocks, market conditions facing the resource sector, and resource management and corporate decisions have led to significant down turns in both these industries in recent years, with direct negative effects on employment and businesses in local Nuu-chah-nulth communities. Unemployment has been chronically high for decades in these communities. Nuu-chah-nulth village sites in the area are limited in size by the Indian Reserve boundaries around them. There is presently little land available for community expansion, which influences significantly the numbers of Nuu-chah-nulth who live in adjacent and distant communities. There are chronic housing shortages and poor housing conditions in all local Nuu-chah-nulth communities. The population of these communities is younger than the surrounding non-aboriginal communities and is growing more quickly than the general population.

Through treaty negotiations currently underway, the Nuu-chah-nulth seek control over their traditional territories and joint management with non-native authorities of resources in the region. First Nations have approached this objective in a spirit of partnership with non-aboriginal communities in the area, in recognition of shared interests in promoting the sustainable use of resources to support healthy communities and an integrated regional economy. The Nuu-chah-nulth also seek to use treaty outcomes and other initiatives to address the full range of economic, social and political issues facing their communities.

Both Nuu-chah-nulth and non-aboriginal peoples live in the communities of Tofino and Ucluelet. Tofino's economy has traditionally been based on commercial fishing and processing, and to a lesser extent on logging and other industrial activity and services. At the same time that industrial resource extraction activity has waned in the region, Tofino has become an increasingly important regional tourist centre, attracting visitors from around the world, and the aquaculture industry has emerged as an important economic sector and employer in the community, including both culture and processing of finfish and shellfish. Growing numbers of tourist facilities -- from luxury to rustic -- are being established in the area, and many new businesses and services have emerged to support tourist activity in sport fishing, whale watching, ocean kayaking, wildlife viewing, wilderness camping, cultural interpretation and surfing. Value added wood manufacturing businesses (manufacture of finished wood products rather than raw lumber production) are increasing in number and size.

Ucluelet is located approximately six kilometres from the southern boundary of the Reserve at the northwest perimeter of Barkley Sound, site of the Broken Group Islands unit of Pacific Rim National Park Reserve. Like Tofino, Ucluelet's economy has long relied on commercial fishing and processing. Industrial logging and ancillary services have also been integral to the local economy for several decades. Logging activity in the area has recently decreased dramatically due to a range of government and corporate decisions, pressures from international and local environmental organizations and market changes. This decline has led to the loss of hundreds of local jobs, and to significant negative social and economic effects in the community. As in other coastal communities in the region, the down turn in fisheries and related processing activities has also had a very detrimental effect on the economy of Ucluelet. Offsetting some of the decline in the resource extraction sector, tourism opportunities are growing in the community, and significant new developments and facilities are under construction and being planned, adding to the existing tourism infrastructure. As in Tofino and the region, the local value added wood manufacturing sector is actively seeking new opportunities, utilizing local wood to create finished products and employ more local people. The adjacent Nuu-chah-nulth community of Ittatsoo, and the non-aboriginal residents living in unincorporated territory near Ucluelet, are faced with similar challenges and opportunities in the transition to a diversified regional economy.

10.5 Names of nearest major towns:

Port Alberni and surrounding communities in the Alberni Valley, located about 125 km by road from the community of Tofino in the Biosphere Reserve, have a population of approximately 26,282 (1996 Census). The provincial capital of Victoria (1996 population of 317,989) is located on Vancouver Island, a distance of 315 km by road. The major urban centre of Vancouver (1996 population of 1,898,687) is located on the mainland of British Columbia, four and one half hours by ferry and vehicle from Tofino.

10.6 Cultural Significance:

The Reserve is located in the heart of the territory of the Nuu-chah-nulth, an indigenous people with a vibrant and complex culture. It is also the site of some of the first and most important interactions between indigenous and European cultures on the northwest coast of North America. Interpretation, research and economic activity within the Reserve will focus on this rich cultural backdrop and on the coastal communities that grew out of this history of cultural interaction. The Reserve includes the only significant sand

beaches on the west coast of Canada that are accessible by road. The new innovations and partnerships between aboriginal and non-aboriginal cultures that are emerging to support stewardship of the bioregion, to promote sustainable economic development and to acknowledge the global importance of a local natural environmental legacy will also be central in interpretive efforts.

11. PHYSICAL CHARACTERISTICS:

11.1 Site characteristics and topography of area:

The terrestrial component of the Reserve consists mainly of steep, highly dissected, forested valleys descending from the mountains of central Vancouver Island (averaging between 1000 and 2000 metres in elevation) to more gently sloping valley floors and a relatively flat but narrow coastal zone adjacent to the Pacific Ocean known as the Estevan Coastal Plain (Esowista Peninsula, Vargas Island and Hesquiat Peninsula). The flat coastal plain is characterized by undulating and, in some sections, boggy ground.

Two large and mountainous islands (Flores and Meares) are situated in the centre of the Reserve; numerous other smaller and less mountainous islands occur throughout the Reserve. The coastal zone has a large number of reefs and islands that protect the inner waters of the Sound from the open ocean. These land forms configure a pattern of narrow passages close to the mainland shores and their associated fjords and estuaries. Coastal habitats are a rich mix of rocky shores, sand beaches and mudflats.

Mountain sides and valley bottoms have numerous watercourses, from major rivers to seasonal and ephemeral streams. There is one large lake (Kennedy) in the Reserve; many small lakes occur in both upland areas and in the coastal plain. The hydro-riparian ecosystems along the many rivers and streams flowing to the sea are critical for ecological processes in the Clayoquot Sound region.

The area is subject to heavy rainfalls (primarily in winter months, but occurring in all seasons), reaching extreme values of 180-220 millimetres or more over 24 hour periods, and leading to rapid fluxes in water flows down mountainsides and in the valleys. This also brings nutrients to the coastal and off-shore waters. The continental shelf adjacent to Clayoquot Sound is relatively narrow, extending to no more than about 20 kilometres off-shore, coinciding roughly with the 200 metre depth contour.

11.1.1 Highest elevation above sea level (meters): 1,804

11.1.2 Lowest elevation above sea level (meters): 0

11.1.3 For marine areas, maximum depth below mean sea level (meters): -55

11.2 Climate:

Within the classification of *Ecoclimatic Regions of Canada, 1989,* the Clayoquot Sound region falls generally under the "Maritime South Pacific Cordilleran Ecoclimatic Region (Spm)". However, local conditions are strongly influenced by proximity to the Pacific Ocean and the mountainous topography. Heavy rains occur throughout the year but are more frequent in winter months (November to March) due to moisture-laden storms moving in from offshore, which are often associated with strong winds. Atmospheric and oceanic climate change and warming is thought to be affecting local natural processes, including marine and terrestrial species distribution and survival and slope and stream processes. Most precipitation records for the area are from low-lying coastal sites; precipitation amounts are believed to be significantly greater at higher elevations in the coastal areas of the Reserve, but no long term data exist for these areas.

The data below are 'climate normals' for Tofino, based on the period 1951-1980, which is a 30 year period for climate normals recommended by the World Meteorological Organization (WMO).

11.2.1 Average temperature of the warmest month: 18.3 (degrees) C

11.2.2 Average temperature of the coldest month: 6.7 (degrees) C

11.2.3 Mean annual precipitation: 3,288 mm, recorded at 20 meters elevation

11.2.4 Climate data have been recorded in the Reserve:

(a) manually since 1909 (Estevan Point), and

(b) automatically since 1942 (Tofino).

11.3 Geology, geomorphology, soils:

The Clayoquot Sound region lies within the Estevan Coastal Plain and Vancouver Island Mountains Physiographic Regions. There is a complex

mixture of sedimentary rock and coarse crystalline metamorphic rock of volcanic origin in the region and numerous steep fault lines, most of which lie parallel to the coast. The rock of the coastal plain is relatively young (under 200 million years old). Inland, the rock is much older (up to 360 million years old) and is frequently cut by granite intrusions. Bedrock outcrops are common on steep slopes and at high elevations. The steep fjords and valleys in the Reserve were carved out in the last glaciation of 12,000 years ago. In coastal lowlands, the bedrock is covered by glacial till deposits. Sand and gravel deposits in the form of deltas, terraces and debris-flow fans lie at the heads of most inlets, arising from both glacial and present-day weathering and slope erosion processes.

Humo-ferric podzolic soils, over till and clay associated with marine deposits, lie along the coastal zone, valley bottoms, and lower slopes of the valleys. Humo-ferric podzolic soils on sand and sandy loam of colluvial origin underlie the steeper slopes in the mountain valleys. Heavy rains are absorbed by networks of pores and channels formed by old tree roots and other ground cavities. As a result, soil formations on the steeper slopes can be relatively unstable, especially in logged areas.

12. BIOLOGICAL CHARACTERISTICS (see biogeoclimatic/habitat type map):

12.1 Type of Habitat:

Temperate Rainforest - Coastal Western Hemlock - Regional

12.1.1 Main species:

This habitat type covers approximately 85% of the terrestrial component of the Clayoquot Sound region, including core, buffer and transition areas, extending to an altitude of about 900 metres. It typifies the coastal perhumid temperate rainforests and includes most of the last remaining examples to be found anywhere undisturbed by logging or other significant industrial development. The habitat type is dominated by the large trees, principally western hemlock (*Tsuga heterophylla).* Western red cedar (*Thuja plicata),* amabilis fir (A*bies amabilis)*, western yellow cedar (*Chamaecyparis nootkatensis)*, sitka spruce (*Picea sitchensis),* pine (*Pinus contorta*), douglas fir (*Pseudotsuga menziesii),* yew (*Taxus brevifolia*) and red alder (*Alnus rubra)* occur in the habitat depending on local conditions.

A vast array of woody shrubs, ferns, other vascular plants, mosses, fungi and lichens thrive in this habitat type.

Animal species are similarly varied, including a diverse range of invertebrates -- insect and gastropod species -- inhabiting all niches from the soil to high forest canopies. Vertebrates, including amphibians, reptiles, birds and small and large mammals are found throughout this habitat type, and approximately 300 vertebrate species have been identified in Clayoquot Sound. Common forest mammals include blacktail deer (*Odocoileus hemionus*), roosevelt elk (*Cervus canadensis*), cougar (*Felis concolor*), black bear (*Ursus americanus*), wolf (*Canis lupus*), mink (*Mustela vison*), marten (*Martes americana*), river otter (*Lutra canadensis*), raccoon (*Procyon lotor*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethica*), red squirrel (*Tamiasciurus hudsonicus*), a number of insectivora, mouse and vole species, and eight species of bats.

12.1.2 Important natural processes:

In the old growth forests, the volume of standing biomass (living and dead) can range in the order of 600-900 cubic metres per hectare and downed wood can accumulate to up to 400 cubic metres per hectare. These forests are characterized by uneven canopies with gaps from old trees that have died and fallen being filled by trees regenerating in the gaps; the gap-phase replacements range from 300 to 1,000 years for sites in the Clayoquot Sound region. Almost half of all vertebrate species in the region breed in downed wood, and many birds, terrestrial mammals and bats use tree cavities to raise their young. A rich understorey vegetation makes use of light from the canopy gaps, and standing and fallen dead wood provides a range of habitats and promotes a variety of ecological processes. Similarly, fallen trees and dead biomass enrich the habitat for resident and anadromous fishes, including the salmon spawning and rearing habitat found in valley bottom streams and rivers.

12.1.3 Main human impacts:

Clear cut logging practices over portions of several valleys and hill tops at lower elevations have had very adverse effects on streams and rivers because of increased erosion, siltation, debris flows and land slides following logging and building access roads on steep slopes.

Logging under past standards has had uncertain impacts on regional biodiversity and natural processes. National and global public concern over negative impacts of logging and other industrial activity in Clayoquot Sound has resulted in significant interest in protection of unlogged areas and in new management practices.

12.1.4 Relevant habitat management practices:

Clear cut logging of large tracts of land is no longer permitted following the acceptance by the provincial government and forest sector interests of recommendations from the *Science Panel for Sustainable Forest Practices in Clayoquot Sound* in 1995. Recognition of the impacts of past logging practices have led to many recent log harvesting innovations and prohibitions from logging on steep or unstable slopes and in hydroriparian reserves. Forest regeneration, logging road deactivation and fish habitat restoration projects are underway throughout the Reserve area.

12.2 Type of habitat:

Temperate Rainforest - Mountain Hemlock - Regional

12.2.1 Main species:

This habitat type occurs at altitudes above 900 metres; it covers approximately 12% of the Clayoquot Sound region. Dominant trees are mountain hemlock *(Tsuga mertensiana),* western yellow cedar *(Chamaecyparis nootkatensis)* and amabilis fir *(Abies amabilis).* Fewer species of animals and plants inhabit the upper mountain slopes than the valley lowlands, although many of the same species listed in 12.1.1 are found in the mountain hemlock habitat type.

12.2.2 Important natural processes:

Successional processes similar to those found in the coastal western hemlock habitat type occur in this forest type, but the mountain hemlock habitat is marked by significantly less biomass and a progressively open canopy as elevation increases. Just below the tree line (at approximately 1200 meters), patches of the mountain hemlock association are mixed with areas of tundra and heath.

The headwaters of many local streams are located in this habitat type, and precipitation and snow melt from this elevation have significant influence on hydrological and biological characteristics at lower elevations.

12.2.3 Main human impacts:

None at present.

12.2.4 Relevant habitat management practices:

None required.

12.3 Type of habitat:

Alpine Tundra - Regional

12.3.1 Main species:

This habitat type constitutes less than 1% of the region at the highest elevations. A limited range of alpine plant and animal species live in the small pockets of tundra in the Reserve.

12.3.2 Important natural processes:

This habitat type is marked by climate extremes and, in some cases, considerable snow pack that provides run off through the summer months and into the early autumn. While comprising only a small proportion of the Reserve area, this habitat type is of significant regional ecological and biological importance.

12.3.3 Main human impacts:

None.

12.3.4 Relevant habitat management practices:

None required. All alpine tundra areas are protected within provincial parks.

12.4 Type of habitat:

Hydroriparian - Streams, Rivers and Freshwater Lakes - Regional
(not mapped on habitat map owing to complexity of systems)

12.4.1 Main species:

These freshwater systems are of critical importance for a number of species, but especially as spawning areas for anadromous salmon populations, upon which the regional Native, commercial and sports fisheries are dependent. About 100 streams and rivers in the Clayoquot Sound region have one or more species of salmonid fish. Species include sockeye salmon (*Oncorhynchus nerka)*, coho salmon (*O. kisutch),* chinook salmon *(O. mykiss),* chum salmon (*O. keta),* pink salmon (*O. gorbuscha),* steelhead/rainbow trout (*Salmo gairdneri),* cutthroat trout (*S. clarkii)* and dolly varden (*Salvelinus malma).* Other fish species found in fresh water systems include sculpins, chub, sticklebacks and lampreys.

Insects and other invertebrates inhabit all stream reaches from mountain slopes to valley bottoms. Many of these species are comprised of isolated populations and are characterized by high genetic diversity. Increasingly diverse plant and animal species are found in lower stream and river reaches and in local lakes.

A variety of bird species (such as eagles, ospreys, ouzels, gulls, ducks and kingfishers) and mammals (such as river otters, mink and raccoon) use the freshwater marine habitat extensively, as do numerous amphibian species.

12.4.2 Important natural processes:

Many of the natural processes of the hydroriparian ecosystem link directly with other forest, downstream and marine processes. As stream bodies reach the lower valleys, temperature, floral production, organic matter and faunal species diversity all increase. This ecosystem supports the spawning cycle of salmon and other fishes, and changes in habitat high on mountain slopes can have significant impacts miles downstream in spawning and rearing habitat. Woody debris and other organic matter are transported through streams and rivers to provide nutrients in estuaries, coastal inlets and out to the continental shelf.

12.4.3 Main human impacts:

Some hydroriparian habitats have been destroyed or damaged as a result of past logging practices. Populations of salmon have been drastically reduced, and extirpated in the case of some river systems, due to habitat destruction, over fishing and effects of recent open ocean temperature increases and other environmental factors affecting a wide range of marine life.

12.4.4 Relevant habitat management practices:

Newly established logging standards and habitat restoration projects underway are intended to help repair damaged fresh water ecosystems. Forestry practices are now designed to retain vegetation and natural drainage patterns to maintain stream flow regimes, soil stability and downstream habitat. Local fisheries management initiatives are intended to assist in the recovery of local fish stocks and to prevent over-harvesting. The rehabilitation of fish stocks with hatchery-reared fish, especially in the Clayoquot River-Kennedy Lake system, is intended to help maintain viable salmon populations. Coast-wide limitations on commercial and recreational fisheries are in effect to reduce pressure on fish stocks and allow for recovery.

12.5 Type of habitat:

Marine Coastal Ecosystems - Regional

12.5.1 Main species:

The coastal passages, estuaries and mudflats in the region support a wide diversity of species. Mudflats, beaches and estuaries are of continental importance as wintering grounds and migratory stop-over areas for large numbers of shorebirds and waterfowl. The Tofino Mudflats Wildlife Management Area and Grice Bay in Pacific Rim National Park Reserve together constitute the second most important resting area on the Pacific Flyway for migratory bird species. Narrow ocean passages in the Reserve are extremely rich in marine species, including some species found only rarely elsewhere on the west coast of Canada.

The Reserve contains the largest cover of eelgrass (*Zostera marina L.*) on the west coast of Vancouver Island, providing spawning, protective and foraging habitat for many marine species. As well, bull kelp (*Nereocystis luetkeana*) beds off the coastal shores and reefs provide habitat for a wide range of species.

In addition to salmon species, a wide variety of other ocean fishes and marine species are found in the coastal areas of the Reserve. There are seasonal occurrences of basking sharks (*Cetorhinus maximus)* in Clayoquot Sound. Locally important fisheries are based on salmon, the Pacific herring *(Clupea harengus pallasi),* various bivalves including geoduck clams (*Panope abrupta)* and other clam species, marine crustaceans including Dungeness crabs (*Cancer magister)* and gooseneck barnacles (*Pollicipes polymerus),* and sea urchins *(Strongylocentrotus fransicanus)* and sea cucumbers (*Parastichopus sp.).*

Gray whales (*Eschrichtius robustus),* killer whales *(Orcinus orca),* humpback whales (*Megaptera novaeangliae*), and a variety of other whale, dolphin and porpoise species all frequent off shore and coastal areas. Steller sea lions (*Eumetopias jubatus*), California sea lions (*Zalophus californianus*) and harbour seals (*Phoca vitulina*) are common in the Reserve. Sea otters (*Enhydra lutris*) have been reintroduced north of the area and are now reestablishing themselves in the Reserve; populations are growing slowly. Commercial aquaculture of native salmon species and introduced Atlantic salmon (*Salmo salar),* oysters and scallops has become a significant economic activity in the in-shore waters in Clayoquot Sound.

12.5.2 Important natural processes:

Marine currents, tides and wave action combine in meeting the nutrient-laden waters of the inland and coastal environment, leading to a rich marine habitat and a diverse mosaic of ecosystems. The predominant off shore current is a prevailing west wind drift from the western Pacific Ocean. In near shore waters, a variable northward drift (the Davidson Current), originating off the mouth of the Columbia River and the entrance to the Strait of Juan de Fuca, flows along the coast of Vancouver Island at a rate of up to three knots, combining with local in shore waters and currents at the entrance to Clayoquot Sound.

The outer coast of the Reserve is exposed to the full force of ocean processes, and the significant wave height for the immediate off shore area is 11 meters (although wave heights of up to 30 meters have been recorded). Again, climate change and fluctuations in ocean current patterns and temperatures, including periodic warm El Nino events, are believed to relate to many apparent changes in species distribution, migration and declining ocean survival rates of species such as salmon. El Nino events are associated with an increase in the number of cyclonic storms, milder winters, increased precipitation, lower air pressure and higher ocean water levels, all of which combine to result in periodic destructive upper shoreline events.

12.5.3 Main human impacts:

Overfishing and habitat degradation (for example, urban and industrial development in foreshore areas) have had negative impacts on salmon and some shellfish species. The effects of marine transportation and whale watching activity on marine mammals and basking shark populations have yet to be determined. Sewage and industrial contaminants have degraded the marine environment near local communities. Oil spills have damaged the coastal area in the past. Some concerns have been raised about the environmental impact of finfish aquaculture and commercial oyster production on ocean floor habitat and in shore marine species.

12.5.4 Relevant habitat management practices:

Recent fishing closures and restrictions imposed by the federal government are intended to allow fish stocks to rebuild. Evolving regulations dictate the conduct of marine traffic and the local whale watching fleet when near whales. Local communities are engaged in waste management planning, and consideration is being given to secondary and tertiary liquid waste treatment facilities to help protect the local marine environment. The provincial government is about to announce its plans for the aquaculture industry, including environmental standards and regulatory mechanisms to ensure that the industry is environmentally sound and sustainable following a comprehensive and independent scientific review.

13. CONSERVATION FUNCTION:

13.1 Contribution to the conservation of landscape and ecosystem biodiversity:

Existing parks and protected areas within the core area of the Reserve conserve a wide range of landscapes and habitat types, contributing to the conservation of ecosystem biodiversity. These Reserve areas total approximately 90,412 hectares in the terrestrial component (34% of terrestrial area) and 19,869 hectares in the marine component (24% of marine area). The terrestrial core areas include tracts of some of the last remaining intact coastal temperate rainforest left on the North American continent, including streams and rivers that serve as critical salmonid fish spawning habitat and as the mode of transport for nutrients that enrich the coastal marine ecosystems. Nine of the area's major forested valleys (each over 1000 hectares) remain untouched by logging or other industrial activity.

13.2 Conservation of species biodiversity:

Protected areas and contiguous buffer zones and reserves provide critical habitat of sufficient size to promote the conservation of species biodiversity. The area is characterized by a rich species biodiversity, and new terrestrial and marine species are identified regularly through ongoing research and inventory initiatives.

Table 1. Terrestrial Fauna and Blue- and Red-Listed Species in Clayoquot Sound

	Amphibians	Reptiles	Birds	Mammals	Total
Species in Clayoquot Sound	7	3	259	29	297
Blue-listed species (vulnerable or sensitive)	--	--	18	3	21
Red-listed species (endangered or threatened)	--	--	9	5	14

(Adapted from Scientific Panel Report, 1995, and ongoing inventories, 1996-98)

In addition to the range of plant and animal species referenced previously, the Reserve provides habitat for a total of at least 14 red (endangered) and 21 blue (vulnerable) listed vertebrate species and an estimated 10 red and blue listed plant species ("red" and "blue" designations are part of a provincial classification system -- see appendices). Under the *Committee on the Status of Endangered Wildlife in Canada* listings, the Vancouver Island Marmot (*Marmota vancouverensis*) is classified as endangered and the Sea Otter (*Enhydra lutris*) and the Marbled Murrelet (*Brachyramphus marmoratus*) are classified as threatened.

One known plant species, *Trillium hibbersoni*, occurs only in Clayoquot Sound. Another, the Seaside Centipede Lichen (*Heteroderma sitchensis*), is only found in the Reserve and surrounding area.

13.3 Conservation of genetic biodiversity:

Protected areas and contiguous buffer zones and reserves also provide critical habitat of sufficient size to promote the conservation of genetic biodiversity. The wide variety of coast, valley, slope and alpine habitat types provides favourable conditions for supporting isolated populations of plants and animals that may exhibit distinctive genetic characteristics.

13.4 Species of Importance to the Nuu-chah-nulth:

A large number of species found within the Reserve are of cultural importance to the Nuu-chah-nulth. Western red cedar has been used for a wide range of products, including tall carved poles indicating family lineages, legends, rights and privileges; ocean-going canoes carved out of single trees; large dwellings made from entire logs and split planks; and a host of boxes, clothing and other products. Salmon and a wide range of marine species are also of key cultural importance.

Many other species of terrestrial and marine plants and animals are used by the Nuu-chah-nulth on an ongoing basis for food, medicine, fuel, basketry, clothing, carving and other art forms. The Nuu-chah-nulth have complex systems of naming and classifying natural phenomena. Published accounts include identification of over 270 species currently recognized and named by the Nuu-chah-nulth, including over 20 species of trees; 30 species of shrubs; 80 species of herbaceous vascular plants; 25 species of bryophytes, fungi, lichens and algae; 20 mammal species; 25 birds species; 35 fish species; 36 marine invertebrate species; and a number of terrestrial invertebrate species.

(For a comprehensive account of this list, consult Appendix V. of Report 3 of the 1995 Scientific Panel for Sustainable Forest Practices in Clayoquot Sound, *First Nations' Perspectives*.)

14. DEVELOPMENT FUNCTION:

14.1 Potential for fostering economic and human development which is socio-culturally and ecologically sustainable:

The transition and buffer areas in the Reserve provide diverse opportunities for sustainable economic and human development -- indeed, innovations are now underway as local communities shift from a primary dependence on logging and fishing to a more balanced and diversified regional economy that also includes tourism, aquaculture and value added manufacturing. All of the current resource management and economic planning processes in the region are being led by, or directly involve, local First Nations and non-aboriginal communities. Current forest development planning is conducted under the recommendations of the *Scientific Panel for Sustainable Forest Practices in Clayoquot Sound* (1995), which are based on principles of conservative and adaptive management, recognizing the precautionary principle; full consideration of ecosystem conditions is a prerequisite to logging.

The Nuu-chah-nulth Central Region First Nations are currently seeking a transfer of the largest forest tenure in the region to Iisaak Forest Resources, a forest company in which they are 51% owners; it is anticipated that Iisaak forest operations will be certified under Forest Stewardship Council standards and will also be certified by First Nations. Other community organizations and businesses are also actively seeking access to, or ownership of, forest and other tenures, including a joint proposal from the District of Ucluelet, Ma-Mook Development Corporation (a First Nation body) and the Long Beach Model Forest for a community forest south of the Reserve. A wide range of value added wood manufacturing activities are under way or planned.

A regional management board -- the Clayoquot Sound Central Region Board -- is responsible for reviewing developments in the terrestrial and foreshore environments prior to the conclusion of treaty negotiations and for community input into the implementation of the recommendations of the *Scientific Panel for Sustainable Forest Practices in Clayoquot Sound*.

The Board was created through the government-to-government *Interim Measures Agreement* of 1994 between the Nuu-chah-nulth Central Region First Nations and the Province of British Columbia; the mandate of the Board

has been extended under the 1997 *Interim Measures Extension Agreement*. The Board is comprised of equal numbers of First Nations representatives and local community representatives appointed by the Province. It operates through consensus decision-making. The Central Region Board is the first cooperative management body of its kind in British Columbia.

Regional management of local aquatic resources is under discussion in treaty negotiations between the Nuu-chah-nulth and the governments of Canada and British Columbia. A local partnership to promote broad based community participation in planning and management -- the Regional Aquatic Management Society -- has been established by the Nuu-chah-nulth and local communities. Implementation of regional aquatic management structures is anticipated in 1999.

The economic transition under way in the region has sparked considerable local interest and efforts towards finding alternatives to unsustainable resource extraction. Particular attention is being given to community forestry and value-added wood products manufacturing, commercial aquaculture and eco-tourism opportunities. First Nations and other local communities are striving to promote a diversified regional economy, including renewed and vibrant fisheries and forestry sectors, as well as tourism, aquaculture and other new opportunities. Significant investments have been made in recent years in road improvements, municipal and community services, tourist accommodations, eco-tourism enterprises, aquaculture businesses and value added wood manufacturing.

14.2 Tourism

Tourism is the fastest growing sector of the regional economy, and the largest regional employer. An estimated one million visitors come to the Biosphere Reserve area annually; this number has grown dramatically in the past decade (an estimated 225,000 people visited the area in 1990) and is expected to increase further in the coming years. Tourist visits have increased, in part, as Clayoquot Sound becomes better known among Americans, Europeans and people from Asian countries. Tourists spent an estimated $20 million (Can.) in the area in 1998.

14.2.1 Types of tourism:

A wide and growing range of tourism opportunities are available in the region, attracting diverse tourist types. Most visitors come to the area to experience the wild coastal environment. Many visitors are drawn by

sport fishing opportunities; organized tours and individual trips and charters are available. Other visitors seek eco-tourism opportunities, including wilderness camping, kayaking and whale and wildlife viewing.

14.2.2 Tourist facilities and description of where these are located and in which zone of the Reserve:

A wide range of tourist facilities and services are available in and adjacent to the Reserve. The communities of Tofino and Ucluelet have over 500 and 300 rooms of tourist accommodation respectively (this does not include substantial numbers of bed and breakfast accommodations available in each community). Major new facilities are under construction and planned in both communities, as well as in First Nations communities. A wide range of ancillary tourist services, including charter operators, restaurants and shops are available in the area. Current and planned facilities will accommodate convention business. A small number of outlying wilderness resorts have been established recently, and a number of private and public campgrounds are situated in the area. All major tourist facilities are located in the Biosphere Reserve's transition zone, apart from camping in approved campgrounds in the National Park Reserve.

14.2.3 Indicate positive and/or negative impacts of tourism at present foreseen:

Positive impacts: Increases in tourism spending, increased seasonal or part-time employment, and new large and small scale service enterprises based in the local communities have all had positive effects on the local economy. Growing reliance on tourism has decreased pressure to allow logging or other resource extraction activities at unsustainable levels, promoting biodiversity and conservation. It has also provided First Nations with a significant increase in business and employment opportunities. The Reserve, and many of the interpretive and educational programs under way and planned in the area, will have significant benefit in increasing the awareness of tourists of traditional ecological knowledge, environmental values, ecosystem functioning, the principles of sustainability and the value of scientific research.

Negative impacts: Growing numbers of visitors have placed increasing strain on municipal and regional infrastructure (water, sewer, roads and solid waste disposal) and National Park infrastructure. The tourist season is slowly extending beyond summer months, leaving less time for the environment to recover from high-use periods. The regional

transportation infrastructure -- particularly the only access highway -- has limited capacity for any increase in traffic. Development pressures within and outside of communities are having a range of negative social and environmental effects. Initiatives are under way to monitor the effects of increased visits to park and wilderness areas on habitat, biodiversity and specific species.

14.3 Benefits of economic activities to local people:

The specific proposal for the Reserve was generated by First Nations and local government leaders, who invited the federal and provincial governments to participate in the process as partners. Consideration of possible economic benefits for the communities, businesses and people of the area has influenced much of the discussion leading to this nomination. It is anticipated that a wide range of local businesses and workers will benefit from growth in the economic activities outlined above. Regional management initiatives, consistent with biosphere themes, are designed specifically to promote a diversified regional economy, reduce First Nations unemployment levels, increase local ownership of resources and resource businesses and promote concrete benefits for local communities, workers and businesses.

15. LOGISTICS SUPPORT FUNCTION:

15.1 Research, monitoring and inventory:

A considerable and growing body of research, monitoring and inventory initiatives are under way or planned in the Reserve, under the sponsorship of a wide range of communities, agencies and institutions.

15.1.1 To what extent has the past and planned research and monitoring programme been designed to address specific management questions in the reserve?

While a variety of related programs and projects are in progress in the Reserve, the majority of the local ongoing and coordinated research, monitoring and inventory efforts are designed specifically to address local forest management issues pursuant to the recommendations of the *Scientific Panel for Sustainable Forest Practices in Clayoquot Sound.* Relevant research to support management decisions has been conducted recently on a wide range of animal species and habitats, vegetation cover, terrestrial ecosystem mapping and analysis, archaeological sites and tourist and recreation use patterns and values. The *Clayoquot Biosphere*

Trust will support community-based research, education and training initiatives that emphasize applied management issues. As well, a number of independent research initiatives are designed to answer specific questions of relevance for local management. Annual science symposiums have been organized by the Clayoquot Biosphere Project and Long Beach Model Forest to promote communication between local people, resource managers and researchers. The National Park Reserve sponsors programs to address management questions, including initiatives focused on biodiversity indicators.

15.1.2 Brief description of past research, monitoring and inventory activities:

Abiotic:

Climate has been studied and recorded for 80 years, and specific weather information has been gathered at Tofino since 1942. Hydrology and geomorphology have been studied sporadically for the past 40 years, often in support of logging development plans. An array of oceanographic studies have been conducted by independent researchers and institutions and through research stations located at Bamfield, Nanaimo and the Institute of Ocean Sciences at Sydney, near Victoria (see 15.1.9).

Biotic:

A wide range of research relating to forest and marine resources has been undertaken in the past. Much of this research relates to planned logging development and possible impacts on wildlife and habitat. Other research initiatives have focused on marine species, including salmon, basking sharks, other fish species, invertebrates, cetaceans, pinnipeds and sea birds. Monitoring of salmon spawning patterns and escapements has been undertaken by government, private and community researchers.

Socio-economic:

Census data, including socio-economic statistics, have been amassed for much of the current century. Ethnographic and historical records are available for the past 200 years. Archaeological research has been conducted in the area for three decades.

15.1.3 Brief description of ongoing research, monitoring and inventory activities:

Abiotic:

New climate and hydrology monitoring stations have been installed throughout the Reserve over the past three years. Multi-year research and inventory initiatives are being undertaken with provincial funding to assess and map terrain stability, landscapes, landslides, hydroriparian systems and water quality and to develop base mapping for the Reserve area.

Biotic:

Significant research continues on forest and marine resources in and adjacent to the Reserve. Additional major multi-year research and inventory initiatives are being undertaken with provincial funding to assess and map vegetation, terrestrial ecosystems, fish and fish habitat and wildlife and wildlife habitat. Ongoing studies on a range of marine species, habitats and processes continue under the sponsorship of a wide range of government agencies and research institutions. Many of the current research and monitoring programs are conducted by local organizations such as the Long Beach Model Forest, Management for a Living Hesquiat Harbour, the Clayoquot Biosphere Project, Strawberry Isle Research Society, forest companies, aquaculture firms, salmonid enhancement groups and independent researchers. The Long Beach Model Forest, with support from the Clayoquot Sound Planning Committee, has commenced the development of a broad monitoring strategy for the Reserve area (covering abiotic and socio-economic criteria as well). The strategy will be consistent with the monitoring guidelines of the *Scientific Panel for Sustainable Forest Practices in Clayoquot Sound* and with the criteria and indicator standards of the Model Forest Network. The Long Beach Model Forest has also undertaken a significant hydroriparian monitoring program, with a particular emphasis on amphibians. An ongoing forest monitoring initiative has been established by the Friends of Clayoquot Sound, a local environmental organization, to provide independent assessment of logging practices and the implementation of the *Scientific Panel* recommendations.

Socio-economic:

Collection of socio-economic data continues through a variety of mechanisms and projects. The initial report of a community-based, multi-phased economic development and diversification study has recently been completed. Additional multi-year research and inventory initiatives are focused on recreation and tourism values and archaeological features.

15.1.4 Brief description of planned research, monitoring and inventory activities:

It is anticipated that many of these multi-year research initiatives will continue in the future, with further directions for research being influenced in large measure by regional management issues and the research priorities of First Nations and local communities. The area is expected to continue to attract growing numbers of external and international researchers. Additional systematic monitoring initiatives are anticipated in both the marine and forest environments. As a Biosphere Reserve, Clayoquot Sound will become a partner in the Ecological Monitoring and Assessment Network of Canada. The Pacific Rim National Park Reserve is also assessing the potential for becoming a local partner in the Ecological Monitoring and Assessment Network's forest biodiversity monitoring initiative, and is establishing human use impact related research and monitoring programs. The Long Beach Model Forest will continue to undertake and promote research and monitoring initiatives within and adjacent to the Reserve. The Long Beach Model Forest is also compiling a comprehensive inventory and report on research projects and studies in the Reserve and adjacent area (covering a wide range of topics, including marine research). The report will be available in the spring of 1999.

15.1.5 Estimated number of national scientists participating in research within the Reserve on

a permanent basis: 20
an occasional basis: 10

15.1.6 Estimated number of foreign scientists participating in research within the Reserve on

a permanent basis: 10
an occasional basis: 10

15.1.7 Estimated number of masters and/or doctoral theses carried out in the Reserve each year:

10

15.1.8 Research stations within the Reserve:

The Clayoquot Biosphere Project has an ongoing program to establish a network of field research stations throughout Clayoquot Sound to support long-term, year-round research in a variety of habitats. One field station was constructed on the shore of Clayoquot Lake in 1992 for forest ecology studies and a second was opened in 1997 in Sydney Inlet. Information can be obtained from the Clayoquot Biosphere Project, P.O. Box 67, Tofino, British Columbia, Canada, V0R 2Z0. [PHONE (250)725-2001, FAX (250)725-2878, EMAIL cbp@island.net]. The Clayoquot Biosphere Project will donate the research stations and other assets to the *Clayoquot Biosphere Trust* when the latter is established.

Individual First Nations within the Reserve have GIS capacity and limited research facilities. Information on Management for a Living Hesquiaht Harbour and facilities associated with its research program can be obtained from the Hesquiaht First Nation, P.O. Box 2000, Tofino, British Columbia, Canada, V0R 2Z0. [PHONE (250)670-1100, FAX (250)670-1102].

The Long Beach Model Forest Society has limited research facilities and meeting space in Tofino. Information can be obtained from the Society at 243 Main Street, P.O. Box 1119, Ucluelet, British Columbia, Canada, V0R 3A0. [PHONE (250)726-7263, FAX (250)726-7269].

Strawberry Isle Research Society, established to conduct primary research on local marine ecosystems, has research facilities in Tofino. Information can be obtained from the Society at Box 213, Tofino, British Columbia, Canada, V0R 2Z0. [PHONE (250)725-3958, EMAIL silse@island.net].

15.1.9 Permanent research stations outside the Reserve:

The Long Beach Model Forest Society has research and GIS facilities in Ucluelet. Information can be obtained from the Society at 243 Main Street, P.O. Box 1119, Ucluelet, British Columbia, V0R 3A0, Canada. [PHONE (250)726-7263, FAX (250)726-7269].

A consortium of Canadian universities operate a marine research station in Bamfield, British Columbia, across Barkley Sound from Ucluelet. Information can be obtained from the Bamfield Marine Station, Bamfield, British Columbia, Canada, V0R 1B0. [PHONE (250)728-3301, FAX (250)728-3452].

The Pacific Biological Station in Nanaimo (200 km east of Tofino) has extensive research facilities to support marine and coastal studies; it conducts and supports research along the entire coast of British Columbia. Information can be obtained from the Pacific Biological Station, Department of Fisheries and Oceans, 3225 Stephenson Point Road, Nanaimo, British Columbia, Canada, V9T 1K3.

A wide range of oceanographic research is conducted on the Pacific coast of North America by the Institute of Ocean Sciences, 9860 West Saanich Road, Sydney, British Columbia, Canada, V8L 4B2.

15.1.10 Permanent monitoring plots:

Permanent weather, hydrological and vegetation monitoring stations are established in the Reserve and linked to national networks. The Clayoquot Biosphere Project, in cooperation with the Smithsonian Institution/UNESCO Man and Biosphere monitoring initiative, has established a permanent forest ecology monitoring station in the Clayoquot River Valley. The government of British Columbia and the Clayoquot Biosphere Project have installed a total of thirteen meteorological monitoring stations and seven hydrological monitoring stations throughout the Reserve.

15.1.11 Research facilities of research stations:

The facilities available from local and regional research stations vary widely. The Clayoquot Biosphere Project field stations are rustic wilderness facilities offering basic shelter. Most local GIS and other computer facilities, libraries, laboratories, classrooms and lecture halls are modest. The towns of Tofino and Ucluelet have community Internet access projects, with Internet connections available for public use; data bases are being developed through these projects to ensure that information on local initiatives is available on line. The Bamfield Marine Station and Pacific Biological Station have more significant research and transportation infrastructure available.

15.1.12 Other facilities:

Accommodation is available in all local communities. A wide range of transportation services is also available. New information and interpretive facilities are planned for the region and the National Park Reserve.

15.1.13 Does the Reserve have an Internet connection?

The *Clayoquot Biosphere Trust* will have an Internet email connection and a world wide web site. Until the Trust is established, email correspondence can be addressed to the Pacific Rim National Park Reserve at "pacrim_info@pch.gc.ca".

15.2 Environmental education and public awareness:

The *Clayoquot Biosphere Trust* will join an established regional network of organizations with education and public awareness objectives relating to sustainable resource use and environmental issues.

15.2.1 Describe environmental education and public awareness activities:

Cultural rediscovery camps, youth leadership programs, and field training and employment experiences for local students, along with broader public education initiatives, are integral components of the First Nation, community and Long Beach Model Forest programs. Pacific Rim National Park Reserve conducts ongoing education and interpretive programs. The Friends of Clayoquot Sound conduct a range of public awareness initiatives concerning regional and global environmental issues. The Clayoquot Biosphere Project attracts university students from across Canada as well as from the United States and Europe to conduct field studies. Strawberry Isle Research Society has education initiatives and ongoing information and awareness programs.

The aquaculture industry and local schools have collaborated to develop education programs for local students. The School for Field Studies operates a local program out of Bamfield; it hosts field courses for academic credit coordinated through Boston University. Other external institutions run seasonal education programs in the area.

15.2.2 Indicate facilities for environmental education and public awareness:

Pacific Rim National Park Reserve offers interpretive programs. A number of nature interpretation trails are maintained for visitors within the Pacific Rim National Park Reserve, as is a major Park interpretative centre at Wickaninnish Beach.

The Long Beach Model Forest operates the Rainforest Interpretative Centre in Tofino; public education programs and lectures are conducted in this facility.

Some commercial whale-watching enterprises, wildlife viewing companies, charter operators and eco-tourism businesses incorporate environmental interpretation in their operations.

15.3 Specialist training:

A variety of local, provincial and national organizations and research, education and training institutions offer specialist training for students, resource managers and agency staff.

15.4 Potential to contribute to the World Network of Biosphere Reserves:

The Reserve has significant potential to contribute to the World Network of Biosphere Reserves owing to the significant research and education initiatives under way in the area, new resource management structures involving First Nations and other local people and existing and planned research, tourism and transportation infrastructure.

15.4.1 Collaboration with existing Biosphere Reserves at the national level:

The Reserve will become a member of the Canadian Biosphere Reserves Association, the national body that coordinates and promotes communication and collaboration between Canadian Biosphere Reserves. A good working relationship has been established between local Biosphere representatives and the Canadian Biosphere Reserves Association and discussions have commenced on cooperative projects and collaborations.

15.4.2 Collaboration with existing Biosphere Reserves at the regional or sub-regional levels, including promoting transfrontier sites and twinning arrangements:

Specific collaborations with other Reserves at the regional or sub-regional levels will await the establishment of the *Clayoquot Biosphere Trust*. The Reserve has significant potential for regional collaboration, including twinning arrangements.

15.4.3 Collaboration with existing Biosphere Reserves in thematic networks at the regional or international level:

Specific collaborations with other Reserves in thematic networks will await the establishment of the *Clayoquot Biosphere Trust*. The Reserve has significant potential for collaboration in thematic networks relating to the participation of indigenous and local peoples in resource management, sustainable forestry, marine mammal research and a host of other themes.

15.4.4 Collaboration with existing Biosphere Reserves at the international level:

Specific collaborations with other Reserves in international networks, beyond that covered by the World Network of Biosphere Reserves, will await the establishment of the *Clayoquot Biosphere Trust*. The Reserve has significant potential for collaboration in international networks, including those already established through the Long Beach Model Forest. Pacific Rim National Park Reserve is twinned with the Halleyo Sahang Sea National Park in South Korea.

16. USES AND ACTIVITIES:

16.1 Core Areas:

16.1.1 Describe the uses and activities occurring within the core areas:

Except for well planned visitor services, facilities, regional infrastructure and trails in Pacific Rim National Park Reserve, and limited public facilities in provincial parks, there is no general public use of or activities within terrestrial core areas. Nuu-chah-nulth people have ongoing aboriginal rights in terrestrial and marine core areas and use these areas for traditional purposes consistent with environmental conservation objectives. Some research is conducted in core areas each year, and very limited research facilities exist in core areas. Commercial and sport fishing is permitted within marine core areas, subject to local closures and regulations. Hunting is permitted in provincial parks under provincial regulations. Non-exclusive provincial park use permits are granted for certain commercial tour activities in provincial parks. Core areas include

established and approved transportation corridors. Newly created parks have resulted in some non-conforming uses in core areas; such uses are being addressed through established jurisdictions and processes.

16.1.2 Possible adverse effects on the core areas of uses or activities occurring within or outside the core areas:

Use of core areas by members of the public may have some adverse impacts on the natural environment unless carefully regulated (e.g., requirements for no-trace camping). Over-harvesting of marine or terrestrial species in other areas, and habitat destruction in and adjacent to the Reserve, may have implications for populations and genetic diversity within core areas.

16.2 Buffer Zones:

16.2.1 Describe the main land uses and economic activities in the buffer zones:

Following the completion of resource management plans for unlogged watersheds in the buffer zones, more elaborate zonation frameworks will be established for these areas, including the possible establishment of further transition zones and protected areas or reserves. The main activities presently occurring in buffer zones are research, monitoring and inventory initiatives, Nuu-chah-nulth traditional uses, hunting, fishing, hiking, wilderness camping, wildlife viewing, mineral exploration, transportation (e.g., through public waterways in the Tofino Wildlife Management Area) and limited commercial activity relating to eco-tourism and back country recreation.

16.2.2 Possible adverse effects on the buffer zones of uses or activities occurring within or outside the buffer zones:

As in core areas, with additional impacts possible through increased use.

16.3 Transition Area

16.3.1 Describe the main land uses and major economic activities in the transition areas:

The main land uses are related to tourism and logging; the main marine use is fisheries (including Native, commercial, commercial sport and sport) and finfish and shellfish aquaculture. Tourism activities are

increasing throughout the transition areas. The town of Tofino is a local service centre for tourism and resource industries.

16.3.2 Possible adverse effects of uses or activities in the transition areas:

Overfishing and salmon habitat degradation have occurred in transition areas. Marine transportation, wildlife and whale watching activity may have adverse effects on marine species and habitat. Sewage and industrial contaminants have degraded the marine environment near local communities and industrial sites. Development pressures from the growing population of Tofino and First Nations communities, and increased tourism, have heightened the need for land use planning, development controls, tourism planning and the provision of water and sewerage services.

17. INSTITUTIONAL ASPECTS:

17.1 State, province, region and other administrative units:

Canada
British Columbia
Nuu-chah-nulth Central Region First Nations
- Ahousaht
- Hesquiaht
- Tla-o-qui-aht
- Toquaht
- Ucluelet

Regional District of Alberni-Clayoquot
District Municipality of Tofino
District Municipality of Ucluelet

17.2 Units of the Reserve:

The Reserve is comprised of contiguous core, buffer and transition areas. Core area components include:

Terrestrial Core Area Components (in hectares)

Strathcona Provincial Park (portion, including Megin Ecological Res.)	58,798
Pacific Rim National Park Reserve (Long Beach Unit)	7,862
Hesquiat Peninsula Provincial Park	6,689
Flores Island Provincial Park	4,144

Clayoquot Arm Provincial Park (includes lake foreshore)	3,491
Clayoquot Plateau Provincial Park	3,155
Sydney Inlet Provincial Park	2,083
Vargas Island Provincial Park (including Cleland Island Ecological Res.)	1,749
Maquinna Provincial Marine Park	1,269
Sulphur Passage Provincial Park	355
Tranquil Creek Provincial Park	299
Kennedy Lake Provincial Park (includes lake foreshore)	188
Gibson Provincial Marine Park	140
Hesquiat Lake Provincial Park	62
Dawley Passage Provincial Park	62
Epper Passage Provincial Park	55
Kennedy River Bog Provincial Park	11
	90,412 ha

Marine Core Area Components (in hectares)

Pacific Rim National Park Reserve (Long Beach Unit)	6,763
Vargas Island Provincial Park	4,039
Flores Island Provincial Park	2,969
Sulphur Passage Provincial Park	1,943
Maquinna Provincial Marine Park	1,398
Hesquiat Peninsula Provincial Park	1,210
Sydney Inlet Provincial Park	691
Strathcona Provincial Park	513
Epper Passage Provincial Park	251
Dawley Passage Provincial Park	92
	19,869

Total Core Areas	110,281

Terrestrial Buffer Zone Components (in hectares)

All major watersheds in which little (less than 2% of area) or no logging or other industrial activity has taken place	58,316
Upland component of Tofino Mudflats Wildlife Management Area	420

Marine Buffer Zone Components (in hectares)

Intertidal component of Tofino Mudflats Wildlife Management Area	1680
Total Buffer Zones	60,416

17.2.1 Are these units separate or contiguous?

Core area and buffer zone units are largely contiguous (see zonation map).

17.3 Protection regime of the core areas and buffer zones:

17.3.1 Core areas:

National Park Reserve - National Parks Act - (new legislation pending)
Provincial Parks - Park Act, RS 1996 Chap. 344, Schedule D
Ecological Reserves - Ecological Reserve Act, RS 1996.

17.3.2 Buffer zones:

Wildlife Management Area - Land Act, Wildlife Act, and Regulation M155, April 8, 1997 (Wildlife Act, SBC 1982 Chap. 57 Section 4).
Unlogged areas - provincial and federal legislation, recommendations of the *Scientific Panel for Sustainable Forest Practices in Clayoquot Sound* and products of approved community-based planning processes.

17.4 Land use regulations or agreements applicable to the transition areas:

General provincial and federal legislation (e.g., Forest Act, Forest Practices Code Act, Wildlife Act, Migratory Birds Act, Fisheries Act, Oceans Act, Environmental Assessment Act, etc.)

In addition to a range of provincial statutes and regulations, recommendations of the *Scientific Panel for Sustainable Forest Practices in Clayoquot Sound* and products of approved community-based planning processes guide forest planning in the region.

The federal Department of Fisheries and Oceans has a range of management plans and regulations governing marine resource use and conservation in the marine component of the Reserve.

17.5 Land tenure of each zone:

17.5.1 Core areas: Provincial (90%)
Federal (10%)

17.5.2 Buffer zones: Provincial (100%)

17.5.3 Transition areas: Provincial (96.5%)
First Nations Reserves (1%)
Municipal Government (1%)
Private timber holdings (1% - est.)
Private lands outside of municipal boundaries, excluding private timber holdings (0.5%)

Non-exclusive licences to harvest trees have been granted to logging companies covering large areas of the Reserve on provincial land. Similarly, other provincial and federal licences authorize a variety of exploration, commercial and recreational activities on public lands in the Reserve. The provincial government has jurisdiction over the ocean floor in marine transition areas; the federal Department of Fisheries and Oceans has jurisdiction over the marine water column.

17.5.4 Foreseen changes in land tenure:

Aboriginal rights and title continue to exist in British Columbia, and issues of tenure, ownership and jurisdiction are under discussion in treaty negotiations between the Nuu-chah-nulth, Canada and British Columbia, including the possible establishment of tribal parks. Nothing in this nomination or proposed designation will prejudice or influence the conduct or outcome of these negotiations or the rights, interests and title of First Nations.

17.6 Management plan or policy and mechanisms for implementation:

A mosaic of approved plans, policies and processes form the basis for management within the Reserve, with the Clayoquot Sound UNESCO Biosphere Reserve Charter serving as an encompassing policy statement on the Biosphere Reserve. Current and new planning efforts and treaty negotiations will lead to further refinements of plans and policies. Major policy statements and plans include management plans of individual First Nations, the provincial government's Clayoquot Sound Land Use Decision, the Interim Measures Extension Agreement, treaty negotiations and

agreements, national and provincial park management plans, the recommendations of the *Scientific Panel for Sustainable Forest Practices in Clayoquot Sound*, and plans currently being developed to guide logging and other resource extraction activities. These documents, or summaries, are appended.

17.6.1 Year of start of management plans:

First Nations' management plans - ongoing
Clayoquot Sound Land Use Decision - 1993
Interim Measures Agreement - 1994 (renewed as Interim Measures Extension Agreement in 1997)
Pacific Rim National Park Reserve - Park Management Guidelines -1994
Strathcona Provincial Park - Master Plan - 1993
Maquinna Provincial Park - Master Plan - 1994
Nuu-chah-nulth Treaty Framework Agreement - 1996
Scientific Panel for Sustainable Forest Practices - 1995
Forest planning initiatives - ongoing

17.6.2 Main features of land use and management plans:

Pacific Rim National Park Reserve's *Park Management Guidelines* provide a vision and management direction for a five year period, including zoning for the terrestrial and marine areas. The Clayoquot Sound Land Use Decision (1993) designated protected areas (new core areas), special management areas and general integrated management areas for forest management purposes. Acceptance of the recommendations from the *Scientific Panel for Sustainable Forest Practices in Clayoquot Sound* by the provincial government in 1995 sanctioned forest planning and operational guidelines that are now in place. The long term maintenance of ecosystems guide all plans and specific management decisions under the Panel's recommendations. The Clayoquot Sound Central Region Board and community-based Clayoquot Planning Committee oversee implementation of the operational recommendations. Responsibility for key aspects of regional land use and management plans, including management plans for core areas, remain with federal and provincial agencies under established statutory authority, subject to treaty negotiations.

17.7 Personnel

Final decisions on the staffing requirements for the Reserve will await operational decisions relating to the establishment of the *Clayoquot Biosphere Trust*. Responsibilities for administration of the Reserve will be augmented by staff from federal, provincial and regional resource management agencies and other bodies, including volunteer and in kind contributions.

17.7.1 Total number of staff of Reserve:

The *Clayoquot Biosphere Trust* is likely to have between 2 and 4 permanent and part time staff. Some specific functions will likely be contracted.

17.7.2 Number of staff for administration and resource management:

All staff will be administrative. The *Clayoquot Biosphere Trust* will have no resource management responsibilities.

17.7.3 Number of staff for research:

The principal objective of the *Clayoquot Biosphere Trust* is to fund and facilitate research, education and training organizations and programs for projects relating to biosphere themes of the environment and sustainable economic development, with a primary emphasis on community-based and applied management research. As such, the Trust will not require its own research staff. If required, specific research tasks will likely be contracted.

17.7.4 Number of technical support staff:

Technical support functions will be contracted as required.

17.8 Financial sources and yearly budget:

Administration funds for the Trust will be provided by income from a dedicated endowment. Overall annual budget may vary, but Reserve administration will likely average $200,000.00 (Can.). The endowment is intended to grow through investment income and fund raising activities.

17.9 Authority in charge of administration:

A number of specific authorities and mechanisms are currently implementing management plan or policy components within their sanctioned spheres of responsibility. In addition to federal and provincial agencies with ongoing statutory responsibilities for specific issues in the Reserve, new or interim regional authorities, such as the Clayoquot Sound Central Region Board, are in place or are under discussion at the treaty negotiation table.

The *Clayoquot Biosphere Trust* will provide logistics support and coordination functions relating to the activities of a number of different research, education and training organizations. It will be the central administrative body for the Reserve, but it will not serve as a resource management body itself. Discussions involving Canada, British Columbia and the Nomination Working Group on the establishment of the Trust are well advanced; it is anticipated that the Trust will be operational by June of 1999. Key matters under discussion include the development of a clear mandate, the principles of community control and local participation in the design of the organization, appropriate accountability mechanisms and reporting structures and the involvement of government and other parties. Until the Trust is established, the Nomination Working Group will remain the key local administrative body for the Reserve.

17.9.1 The proposed biosphere reserve as a whole:

Name: Clayoquot Biosphere Trust

Legal powers: Non-Profit Society established under the Societies Act, comprised of First Nations and local community trustees, with federal and provincial representation.

17.9.2 The core areas:

National

Name: Pacific Rim National Park Reserve

Legal powers: National Parks Act

Provincial

Name: Ministry of Environment, Lands and Parks

Legal powers: Provincial Park Act
Provincial Ecological Reserve Act

17.9.3 The legally established buffer zones:

Name: Ministry of Environment, Lands and Parks

Legal powers: Provincial Land Act
Provincial Wildlife Act

17.9.4 Mechanisms of consultation and coordination among these different authorities:

Formal and informal networks have been established among all federal, provincial, First Nation, municipal and cooperative resource management bodies operating in the Reserve. Overlaps in roles, responsibilities and memberships enhance consultation and coordination among local resource management, research and education organizations.

17.10 Local organizational arrangements:

17.10.1 Indicate how and to what extent the local communities living within and next to the Reserve have been associated with the nomination process:

The entire nomination process for the Clayoquot Sound Biosphere Reserve has been under the direction of First Nation and local communities. The Clayoquot Sound Central Region Board, in accordance with its mandate in the Interim Measures Extension Agreement (see 14.1), has had a role in monitoring and coordination of the initiative, with an emphasis on public forums and workshops. Three major public forums on the Biosphere Reserve have been sponsored by the Central Region Board in the last two years.

This nomination was developed by the Clayoquot Sound UNESCO Biosphere Reserve Nomination Working Group, a local body comprised of representatives of the Nuu-chah-nulth First Nations, local mayors and other political leaders, with support from the

provincial and federal governments and other institutions and organizations. Representatives of the Nomination Working Group have met with a wide range of community organizations and stakeholders. The nomination reflects the outcome of over two years of extensive community consultation.

Key elements of the model for the *Clayoquot Biosphere Trust*, including the organization's scope and objectives, were developed by a regional research and education coordinating committee. This group was appointed by the Nuu-chah-nulth Central Region First Nations and local governments. It released its preliminary report on the Trust concept in November of 1998, in collaboration with the Nomination Working Group, after numerous inter-community meetings and discussions with local organizations, researchers and educators.

The final public forum on the nomination was hosted by the Nomination Working Group on January 23, 1999, to discuss the nomination and proposed legacies, including establishment of the Trust. Representatives from all local communities, First Nations, federal and provincial agencies, environmental organizations, community management bodies, major resource industries, educational institutions, local businesses and area residents were in attendance. There was widespread support for submission of the nomination to UNESCO.

17.10.2 Indicate how and to what extent the local communities can participate in the formulation and implementation of the management plan or land use policy:

All of the current economic planning and resource management processes in the region are being led by, or directly involve, local First Nations and non-aboriginal communities. Current forest development planning is conducted under the recommendations of the *Scientific Panel for Sustainable Forest Practices in Clayoquot Sound* (1995), which require the participation of First Nations and local communities at all stages of the planning process. New partnerships among local communities, First Nations, management bodies and federal and provincial agencies are leading to new cooperative mechanisms and collaborations in plan and policy formulation.

18. SPECIAL DESIGNATIONS:

Possible additional designations include:

(x) RAMSAR Wetland Convention Site (Tofino Mudflats Wildlife Management Area)
(x) Long term monitoring site (Ecological Monitoring and Assessment Network)
(x) Other - Western Hemisphere Shorebird Reserve (Tofino Mudflats Wildlife Management Area)

19. LIST OF SUPPORTING DOCUMENTS:

19.1 Clayoquot Sound Biosphere Charter

19.2 Important species (threatened, endangered)

19.3 Principal bibliographic references

19.4 Maps

19.4.1 General location map

19.4.2 Biosphere zonation map

19.4.3 Core protected areas/parks and ecological reserves

19.4.4 Principal settlements

19.4.5 Biogeoclimatic map/habitat types

19.5 Appendix A - Interim Measures Extension Agreement

19.6 Appendix B - Nuu-chah-nulth Treaty Framework Agreement

19.7 Appendix C - Clayoquot Sound Land Use Decision

19.8 Management plans:

19.8.1 Appendix D - Pacific Rim National Park Reserve - Park Management Guidelines

19.8.2 Appendices E and F - Provincial Parks - Master Plans (Maquinna Provincial Park and Strathcona Provincial Park)

19.8.3 Appendix G - Tofino Mudflats Wildlife Management Area - Proposal and Establishment Regulation

19.8.4 Appendices H, I and J - Executive Summaries of Reports #3, #4 and #5 of the *Scientific Panel for Sustainable Forest Practices in Clayoquot Sound (First Nations' Perspectives Relating to Forest Practices Standards in Clayoquot Sound; A Vision and Its Context: Global Context for Forest Practices in Clayoquot Sound; Sustainable Ecosystem Management in Clayoquot Sound - Planning and Practices)*

19.9 Appendix K - Local agencies, panels and organizations cited in text

20. ADDRESSES:

20.1 Contact address of the Reserve:

Organization:	Clayoquot Biosphere Trust (c/o) Pacific Rim National Park Reserve
Street or P.O. Box:	P.O. Box 280
City:	Ucluelet
Province:	British Columbia, Canada
Postal Code:	V0R 3A0
Telephone:	250-726-7721
Fax:	250-726-4720
Email:	pacrim_info@pch.gc.ca

20.2 Administering entity of the core areas and legally established buffer zones:

Government of Canada

Name:	Alex Zellermeyer, Superintendent
Organization:	Pacific Rim National Park Reserve
Street or P.O. Box:	P.O. Box 280
City:	Ucluelet
Province:	British Columbia, Canada
Postal Code:	V0R 3A0
Telephone:	250-726-7721
Fax:	250-726-4720
Email:	pacrim_info@pch.gc.ca

Government of British Columbia

Name:	Jim Walker, Special Advisor
Organization:	B.C. Ministry of Environment, Lands and Parks
Street or P.O. Box:	P.O. Box 9339 Stn Prov Govt
City:	Victoria
Province:	British Columbia, Canada
Postal Code:	V8W 9M1
Telephone:	250-356-0121
Fax:	250-387-5669
Email:	jwalker@executive.env.gov.bc.ca

CLAYOQUOT SOUND UNESCO BIOSPHERE RESERVE CHARTER

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

THE VISION

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

- *the rights, interests and stewardship responsibilities of First Nations and other local communities;*

- *the need for diversified local economies, including renewed and vibrant fisheries and forestry sectors, tourism, aquaculture and new opportunities, and for community access to local resources;*

- *the need to better understand natural and economic processes through the application of traditional and local knowledge and scientific research, inventory and monitoring efforts;*

- *the training and education requirements of local people, and opportunities for researchers and students from around the world; and*

- *the role of youth and elders in designing a sustainable future.*

PRINCIPLES

- *The Biosphere Reserve and associated initiatives will be a positive focus for partnerships among First Nations, other local communities and all parties that support a sustainable future for the people of Clayoquot Sound, the surrounding region and the world.*

- *The Biosphere Reserve will encourage the ongoing social, cultural and economic development needed to sustain healthy communities in the region.*

- *The designation, zonation model and any processes or initiatives associated with the Biosphere Reserve are without prejudice to the interests, rights and title of the Nuu-chah-nulth Central Region First Nations and to ongoing treaty negotiations and outcomes.*

- *The UNESCO Man and Biosphere zonation model will be used by all parties solely as a consideration in established or future land and resource planning processes or treaty negotiations, where decisions are appropriately made on ownership, jurisdiction and designations; the zonation model outlined in the nomination will evolve in accordance with decisions reached in these duly sanctioned forums and will not be construed to limit or direct decisions on land or resource designations.*

- *The designation will support local decision-making initiatives and structures, including those of First Nations, local governments and regional authorities.*

- *The designation will be used to promote a sustainable regional economy and environmental health; it will not be used by any party to supplant existing businesses, industries or institutions or to limit current or proposed economic activity or transportation or property rights in the region.*

- *The designation will be used to promote new opportunities in research, education and training, and to support related initiatives and new partnerships among First Nations, local communities, institutions, businesses and other parties.*

- *The Biosphere Reserve will benefit youth in the region, both directly through education and training initiatives and through associated community programs.*

- *The designation will be used to create opportunities to develop appropriate infrastructure in the region in order to support a diversified economy and new institutional initiatives.*

- *The designation will be used to promote the region and its products around the world.*

- *The Biosphere Reserve and associated initiatives will recognize and support the authority of First Nations, local governments and provincial and federal governments; the designation relinquishes no authority to other bodies, and ongoing involvement in the World Network of Biosphere Reserves will be at the discretion of the signing parties.*

Red Listed Species in Clayoquot Sound Biosphere Reserve
(Birds and Mammals)

Birds

Western Grebe	*Aechmophorus occidentalis*	Not nesting
Brandt's Cormorant	*Phalacrocorax penicillatus*	
Northern Goshawk	*Accipiter gentills laingi*	Possible
Upland Sandpiper	*Bartramia longicauda*	
Forster's Tern	*Sterna forsteri*	
Common Murre	*Uria aaige*	
Thick-billed Murre	*Uria lomvia*	Possible
Marbled Murrelet	*Brachyramphus marmoratus*	
Horned Puffin	*Fratercula corniculata*	

Mammals

Water Shrew	*Sorex palustris brooksi*	
Keen's Long-eared Myotis	*Myotis keenii*	
Vancouver Island Marmot	*Marmota vancouverensis*	Skeleton
Wolverine	*Gulo gulo vancouverensis*	Possible
Sea Otter	*Enhydra lutris*	

Blue Listed Species in Clayoquot Sound Biosphere Reserve
(Birds and Mammals)

Birds

Double Crested Cormorant	*Phalacrocorax auritus*	
Great Blue Heron	*Ardea herodias*	Not nesting
Trumpter Swan	*Cygnus buccinator*	Not nesting
Oldsquaw	*Clangula hymealis*	Not nesting
Surf Scoter	*Melanitta perspicillata*	Not nesting
Peregrine Falcon	*Falco peregrinus pealei*	Possible
Gyrfalcon	*Falco rusticolus*	Not nesting
White-tailed Ptarmigan	*Lagopus leucurus saxitilis*	
Sandhill Crane	*Grus canadensis*	Not nesting
American Golden Plover	*Pluvialis dominica*	Not nesting
Wandering Tattler	*Heteroscelus incanus*	Not nesting
Short-billed Dowitcher	*Limnodromus griseus*	
California Gull	*Larus californicus*	Not nesting
Caspian Tern	*Sterna caspla*	Not nesting
Cassin's Auklet	*Ptychoramphus aleuticus*	
Tufted Puffin	*Fratercula cirrhata*	
Northern Pygmy Owl	*Glaucidium gnoma swarthi*	
Northern Saw-Whet Owl	*Aegolius acadicus brooksi*	

Mammals

Killer Whale	*Orcinus orca*	Resident
Killer Whale	*Orcinus orca*	Transient
Killer Whale	*Orcinus orca*	Offshore
Harbor Porpoise	*Phocoena phocoena*	
Roosevlet Elk	*Cervus elaphus roosevelti*	

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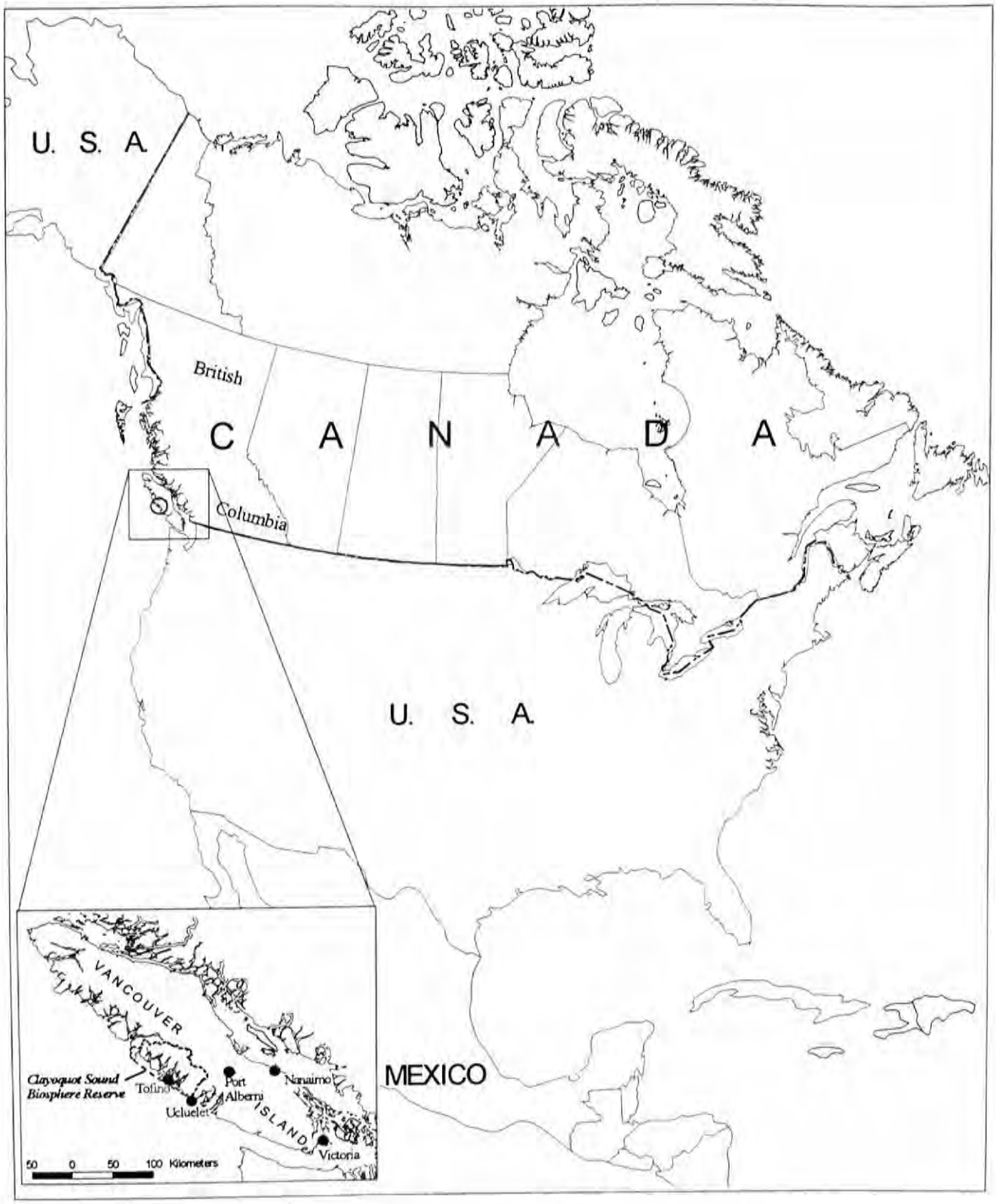
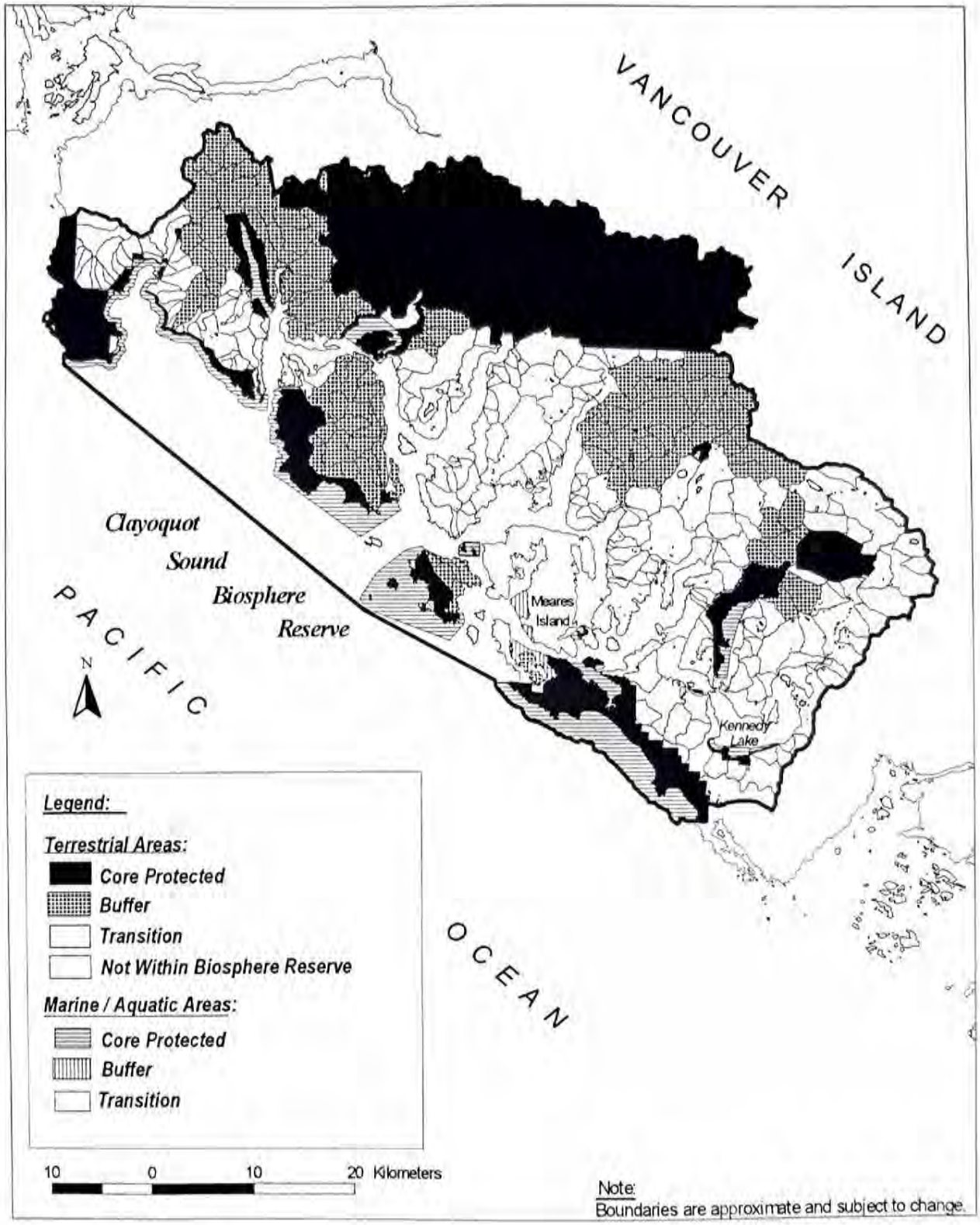
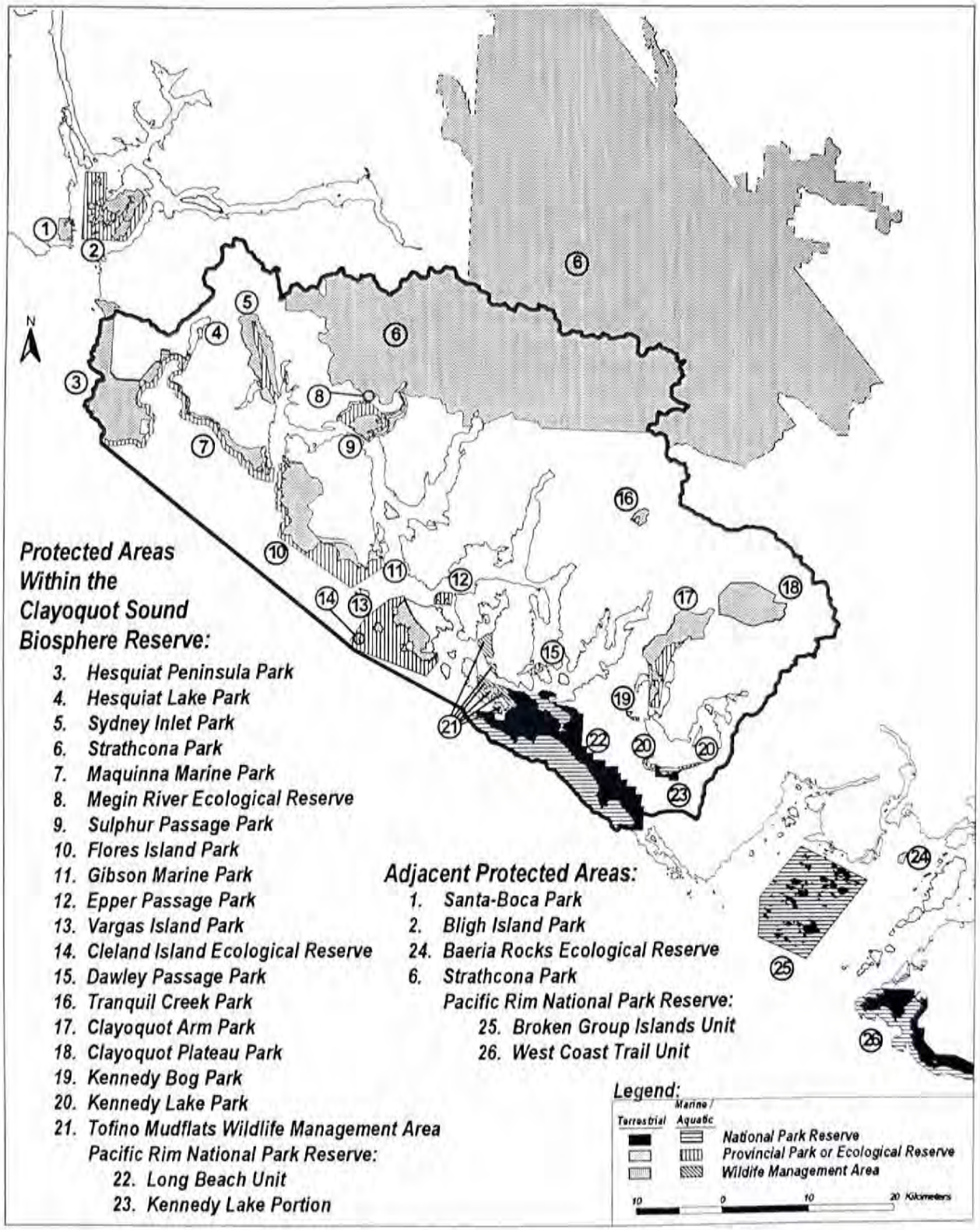


Location of the Clayoquot Sound Biosphere Reserve

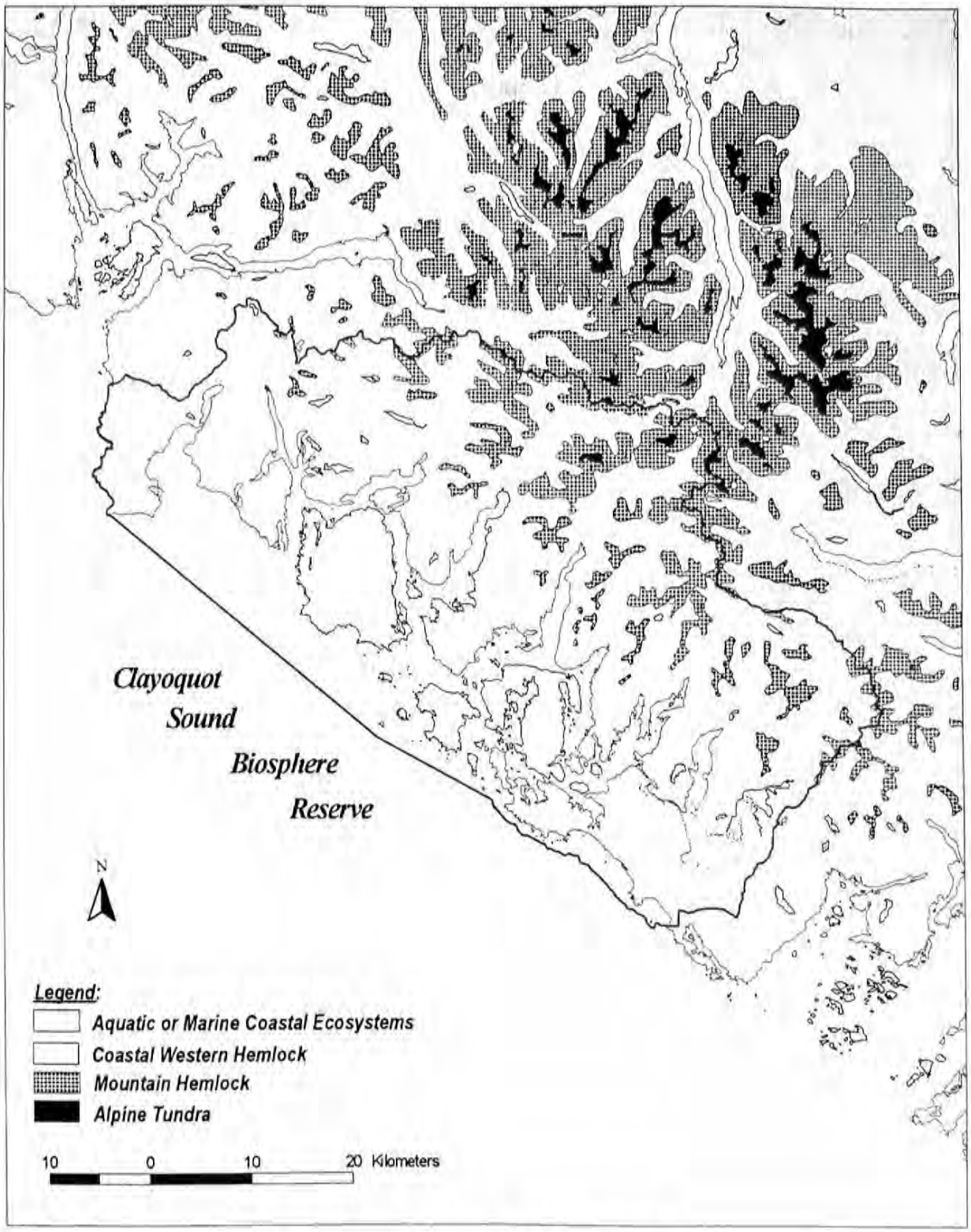


Clayoquot Sound Biosphere Zones

Principal Settlements of the Clayoquot Sound Area



Protected Areas In and Around the Clayoquot Sound Biosphere Reserve



Biogeoclimatic Zones / Habitat Types of the Clayoquot Sound Biosphere Reserve and Surrounding Area