CLAYOQUOT SOUND BIOSPHERE RESERVE

Periodic Review, August 2010

Photo credits (unless otherwise specified): Sharmalene Mendis-Millard

George Francis, Sharmalene Mendis-Millard, and Maureen Reed
With help from Colleen George

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PREFACE: Conduct of the Periodic Review

The Canadian Commission for UNESCO (CCU) invited George Francis, Distinguished Professor Emeritus in the Faculty of Environment at the University of Waterloo, Ontario, to be the lead reviewer for the periodic review of the Clayoquot Sound UNESCO Biosphere Reserve. Sharmalene Mendis-Millard, PhD candidate in Geography and Environmental Management at the University of Waterloo, and Coordinator of the Canadian Biosphere Research Network (CBRN) was appointed to be the second reviewer.

In addition, the CCU invited Maureen Reed, Professor, School of Environment and Sustainability and Department of Geography and Planning at the University of Saskatchewan to be the lead reviewer with Ms Mendis-Millard as the second reviewer for the Mount Arrowsmith Biosphere Reserve. Colleen George, a PhD student in the School of Environment and Sustainability at the University of Saskatchewan accompanied Dr. Reed as an informal assistant. Both biosphere reserves were designated as such by UNESCO in 2000. Although they operate in markedly contrasting sets of circumstances, they are only about 45 km apart at their closest point in the middle of Vancouver Island, British Columbia. In consultation with CCU and people within both biosphere reserve organizations, it was decided to do the field visits in sequence with all four participants; additional expenses were covered by the lead reviewers.

In preparation for the review of Clayoquot Sound, George Francis prepared a draft report from many secondary sources of information on the main trends and events that had unfolded over the past ten years or so (some issues needed a longer time perspective to be better understood). This material was summarized in the current format for periodic reviews used in Canada, and in three of four Appendices. In mid-March 2010, the draft was then sent to the review team and to Curtis Cook, Executive Director of the Clayoquot Biosphere Trust Society (CBT), the convener organization for the biosphere reserve. The intent was to allow time for a review of the draft before our site visit in order to note corrections, additions, or other revisions that could well be necessary. Preparation of a draft also helped identify particular questions that could only be answered through discussions with people associated with the CBT or with people within the biosphere reserve region; hence, the draft helped focus priorities for the short time allotted for the on-site visit.

Mr. Cook shared this first draft with members of the CBT Board of Directors. He also distributed a general survey in early May 2010 (using "SurveyMonkey.com – surveys made simple") to residents who sit on four CBT Advisory Committees and selected organizations who have benefited from CBT funding to solicit their views and understandings about the biosphere reserve designation and its use in their region.

The field visit to the Clayoquot Sound region was conducted from May 11-15, 2010, scheduled mainly because it could include the day-long Annual General Meeting (AGM) of the Board of Directors for the CBT on May 14th. Our visit also coincided with the 12th International Congress of Ethnobiology held the same week. It was organized and sponsored locally by the Tofino Botanical Gardens Foundation. A number of people who have been associated with the biosphere reserve throughout the years attended sessions at this Congress; Ms Mendis-Millard also volunteered and participated in some events.

Mr. Cook and CBT staff helped organize an itinerary (as much as they could in advance) and set out documents for us to examine in their new office. Some meetings were arranged spontaneously. Satnam Manhas from Ecotrust facilitated meetings with fellow staff and introduced the reviewers to two members of the Tla-o-qui-aht First Nation, while other meetings were arranged by Ms Mendis-Millard based on her personal contacts in the community. Ms Mendis-Millard has been carrying out social science research in the Clayoquot Sound area since 2002. Most recently in 2008, she completed an analysis of the proposed core priorities of the CBT at the request of the former Interim Executive Director (David Fraser, 2007-2008) while in the area to collect data for her doctoral research, which included group discussions with each of the then five CBT advisory committees.

Our more formal interviews varied but generally addressed one or more of four themes, starting with a brief explanation of what the review was about. We emphasized that it was a review of the experience of the biosphere reserve over the past decade or so, which is of general interest for people elsewhere in Canada and the world who are interested in biosphere reserves and how their ideals are being addressed under the particular circumstances of the places that they are in. It was not to be a detailed program performance evaluation or audit. We asked about the respondents' views of the main changes that had occurred either in the biosphere reserve generally, or in the particular

sectors they were working in over the past 10 years or so, their views on what the CBT as the convener organization for the biosphere reserve has best been able to do and what constraints it may have been under, and, finally, their views about what may lie ahead for the region itself, for the sectors of greatest concern for them, and for developing the role of the CBT. Supplemental questions were asked as the discussions went on for clarifications, specific examples, or other information of mutual interest. With the respondents' permission, notes were made as we went along.

At the AGM of the CBT, George Francis made a brief statement about the rationale and purpose of the periodic review, and Maureen Reed asked for input on questions such as issues the CBT had to deal with over the past decade, achievements to report, and perceptions of what may lie ahead given the many local changes that have occurred (as noted in this report). The reviewers then enjoyed a social dinner with the CBT Board of Directors and staff and invited guests.

In some situations, useful information and insights came from informal group discussions. This was especially the case for rounding out our understanding of particular topics for which we had little prior information. The limited time for on-site visits precluded going to communities other than Tofino, Ucluelet and Port Alberni. Thus, the additional information we obtained is not presented as if it came from a significant "representative sample" of people in the biosphere region. Rather, it was from available individuals that had experiential knowledge that helped enrich our understanding of matters discussed.

While we attempted to be reasonably comprehensive and complete in our review, there were two main limitations to achieving this. As noted, one was the limited time in the biosphere reserve region that happened also to coincide with a major conference that preoccupied people whom we might have otherwise interviewed. The short time period also precluded meetings with key individuals who were not available at the time as well as travel to the First Nation communities, especially to those in the more remote locations accessible only by old logging roads, boats, or float planes (weather permitting). This severely limited direct input from Nuu-chah-nulth people. The other was a lack of easy access to the results of the extensive work of local organizations and individuals in the biosphere reserve that address important local issues. Much of this material remains stored in the administrative files of the CBT (and other organizations) and has not been

compiled and analyzed for other purposes (as we note in our findings). The result is that our report remains heavily dependent on information accessed from academic studies, websites or other secondary sources with only modest additional elaboration and clarification from people who helped produce it, or who had experiential knowledge of the situations being assessed.

The initial draft report was corrected, revised and expanded with the additional information and documents received during the field visit and from the review team. It was then sent to Mr. Cook for his (and the CBT Board's) review, as well as to selected interviewees for the general balance and appropriateness of the reviewers' observations and conclusions. With some changes resulting from comments and constructive suggestions and in light of the CBT survey results, the following report is hereby respectfully submitted. Although the feedback helped us to make this review more accurately reflect the breadth of issues and activities within the region and the CBT's governance, initiatives and plans, any remaining errors or omissions remain ours.

Sections 1 and 2 are summary overviews; Sections 3 to 6 provide more detailed information. Section 7 presents our conclusions and suggested directions to pursue. Once the final report has been processed by UNESCO/MAB, it will be made available on the Canadian Biosphere Research Network website (http://www.biosphere-research.ca/bibliography_for_UNESCO.htm). Organizations, government agencies and bodies and initiatives are bolded throughout the paper for easy reference.

With great appreciation, we wish to acknowledge the time, help and hospitality we received from everyone we met in varying capacities. We are very grateful to the local organizers from the CBT as well as Ecotrust employees who made our stay both enjoyable and informative. We are also thankful to those who provided constructive feedback on drafts of this report, and to the 58 people who took the time to fill out the CBT's survey for this review. Special thanks to those who provided their photos and permissions to use online photos on short notice.

They include the following people, listed in alphabetical order by surnames:

Interviews and meetings

Stephen Ashton. Councillor, District of Tofino

Cliff Atleo, Sr. (Senior). President, Nuu-chah-nulth Tribal Council, Port Alberni

Stan Boychuk. Former Executive Director, CBT, 2002-2007

Curtis Cook. Current Executive Director, CBT, 2008 - present

Andrew Day. Director, Tsawalk Partnership, West Coast Aquatic, Port Alberni

Chantel Gemmel. Ucluelet Community Food Initiative; Regional Vancouver Island Food Network

Kim Seward-Hannam. Superintendent, Pacific Rim National Park Reserve

Stephanie Hughes. Ecotrust Canada, Clayoquot Project Coordinator; At-Large Alternate Director, CBT Board

Brenda Reid-Kuecks. President, Ecotrust Canada, Vancouver

Laura Loucks. Ecotrust Canada, seconded to the Tsawalk Partnership as the Clayoquot Marine Project Manager

Satnam Manhas. General Manager, Forest Communities Program, Ecotrust Canada and Nuu-chah-nulth Central Region Chiefs

George Patterson. Director, Tofino Botanical Gardens Foundation and Clayoquot Field Station; founding member of the Clayoquot Biosphere Project (with Ecotrust US) in 1991; former member of the CBT Board, 2000-2005

Coral Thew. Interpretation Coordinator, Pacific Rim National Park Reserve

Norine Messer. Capacity Building Coordinator, Uu-a-thluk Fisheries; Community Facilitator, Coastal Family Resources Coalition

Short, informal or social meetings

Greg Blanchette. Friends of Clayoquot Sound

Douglas Brooker. Rainforest Farm Project

Michael Davis. Ecotrust Canada

Eli Enns. Project Coordinator, *Ha-uukmin* Tribal Park, Tla-o-qui-aht First Nation

Chief Anne Mack. Hereditary Chief, Toquaht First Nation; Nuu-chah-nulth Central Region Language Group; former member of the CBT Board; CBT Culture Committee

Joe Martin. Master Canoe Carver, Tla-o-qui-aht First Nation

Maryjka Mychajlowycz. Friends of Clayoquot Sound

John Platenius. Alternate Director for the District of Tofino, CBT Board

Michael Tilitzky. Councillor, District of Tofino

Tim Webb. Westcoast Inland Search and Rescue; EmerGeo Solutions Inc.; former Chair (5 years) and Board Member for the District of Tofino (6 years), CBT Board

Vera Webb. Pacific Rim Hospice Society; Ladies of Ledger Bookkeeping

CBT Board of Directors and Staff who attended the AGM

Lorraine Cameron. Environment Canada; Ex-officio, CBT Board

Curtis Cook. Executive Director, CBT

Violet Clark. Ahousaht First Nation, CBT Board

Curtis Dick. Alternate for Ahousaht First Nation, CBT Board

Darcy Dobell. Vice-President, World Wildlife Fund Canada, Pacific Region, Vancouver; former Co-Chair and current Director for the District of Tofino, CBT Board

Jessie Fletcher. Development Officer (Biosphere Programs, Policies and Communications), CBT

Stephanie Hughes. Clayoquot Project Coordinator, Ecotrust; Alternate At-Large, CBT

Rebecca Hurwitz. Community Coordinator, CBT

Bill Irving. Councillor. An active participant in the biosphere reserve nomination process as former Mayor of Ucluelet; Alternate Member for District of Ucluelet, CBT Board

Gary Johnsen. Nation Administrator, Toquaht First Nations; President, Iisaak Forest Resources Ltd.; Director (for Toquaht), Mamook Development Corporation Board; Treasurer and Director for Toquaht First Nation, CBT Board (10 years)

Don McMillan. Clayoquot Forest Management Ltd., Ucluelet; Chair, Central Westcoast Forest Society; former Manager, Interfor, West Coast office; At-Large Director and Co-Chair, CBT Board

John Platenius. Altnerate for District of Tofino, CBT Board

Eric Russcher. Mayor of the District of Ucluelet; Director for Ucluelet, Secretary, CBT

Kim Seward-Hannam. Superintendent, Pacific Rim National Park Reserve; Ex-officio, CBT Board (3 years)

Jean Wylie. Office Manager, CBT

West Coast people who generously donated their photos or provided permissions:

Karen Charleson. Hooksum Outdoor School (www.hooksumschool.com)

Curtis Cook. Executive Director, CBT

Jessica Jean Hutchinson. General Manager, Central Westcoast Forest Society

Satnam Manhas. General Manager, Forest Communities Program, Ecotrust Canada and Nuu-chah-nulth Central Region Chiefs

Joe Martin and Douglas Wright. Tla-ook Cultural Adventures

Tim Rundle. Creative Salmon Company Ltd.

Barbara Schramm. Photographer and graphic designer (www.longbeachmaps.com)

Allison Timmermans. Ucluelet youth

Celina Tuttle. Coordinator of Make It Happen – Nurturing Youth and Community Capacities

Jean Wylie. Office Manager, CBT

BIOSPHERE RESERVE PERIODIC REVIEW - CANADA

SECTION 1. Name of the Biosphere Reserve

CLAYOQUOT SOUND BIOSPHERE RESERVE

1a. Map and location

Please provide a location map, and a map of the zonation for the biosphere reserve (for ease of reference).

Figure 1: Location of the Clayoquot Sound Biosphere Reserve
Source: Wickipedia, Accessed July 31, 2010

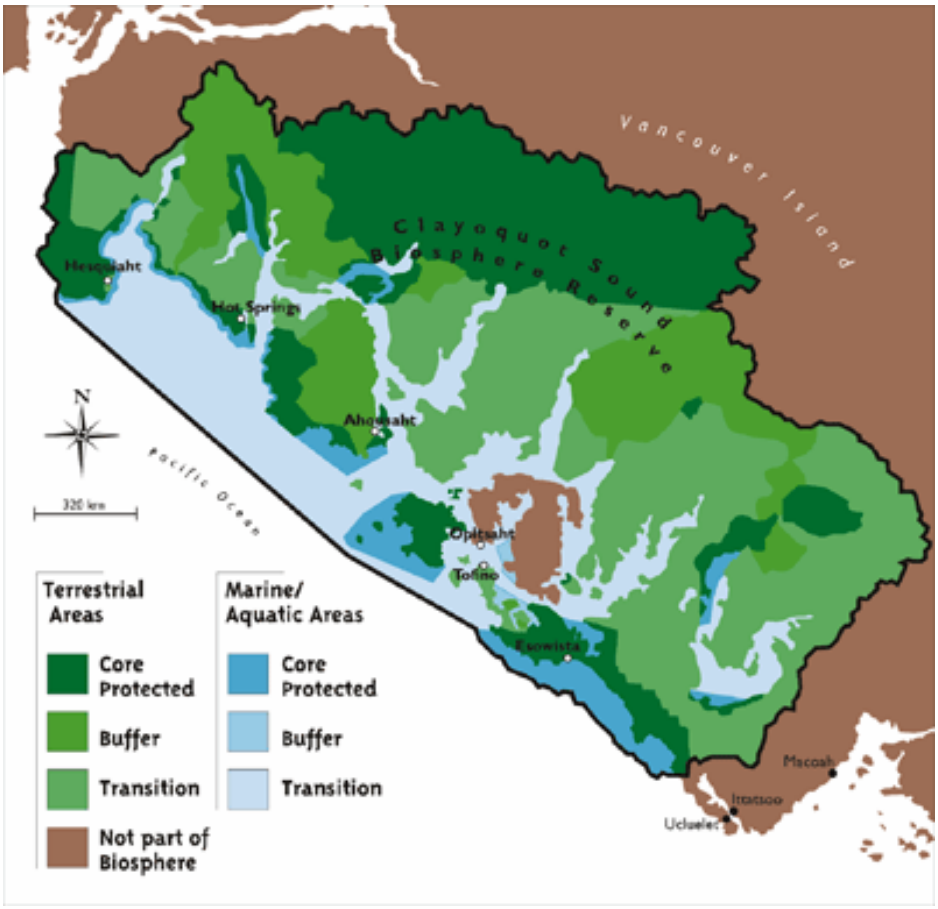


Figure 2: Zonation of the Clayoquot Sound Biosphere Reserve
Source: Clayoquot Biosphere Trust website (www.clayoquotbiosphere.org)

Please note: There has been some discussion by the **Clayoquot Biosphere Trust** about extending the official boundary of the transition area south to include the territories of the **Ucluelet** and **Toquaht** First Nations and District of **Ucluelet**, which are all part of the greater biosphere reserve region. They also have representatives on the **CBT** Board of Directors.

1b. Year of designation and first periodic review

Year designated: 2000 **Year of first periodic review:** (2010)

1c. Changes or corrections to be made in the information for the UNESCO/MAB Biosphere Reserve Directory

(If the changes are substantial, refer to other sections below where they are described more fully. For reference, a copy of the information about your biosphere reserve is available on the UNESCO-MAB Biosphere Reserve Directory accessible through the web.)

Please see Appendix 1 (MABnet Directory of Biosphere Reserves), which used the format of Annex 1 in the biosphere reserve nomination form.

1d. Actions in response to previous periodic review

Brief summary of the follow-up actions taken in response to each of the UNESCO recommendations from the first periodic review (where applicable).

Not applicable; this is the first periodic review for this biosphere reserve.

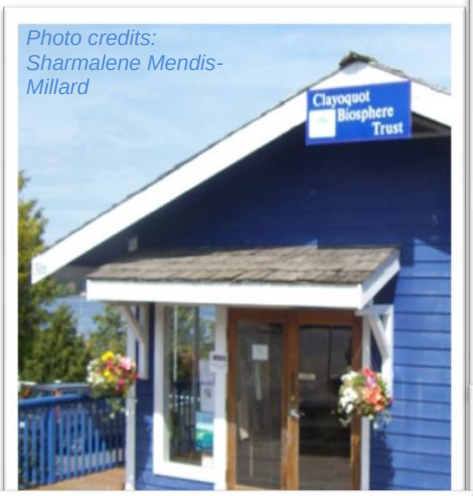
1e. Other observations or comments on the above

The Clayoquot Sound Biosphere Reserve region is home to five communities of Indigenous (Aboriginal) people whose name and language is Nuu-chah-nulth, meaning people who live along the mountains and the sea. They are related to nine other similar communities whose traditional territories are also along the west coast of Vancouver Island. Together, 12 of these communities form the **Nuu-chah-nulth Tribal Council.** The Council provides services and also represents the Central Region First Nations (**Ahousaht**, **Hesquiaht**, **Tla-o-qui-aht**, **Toquaht**, and **Ucluelet**) in negotiations with the Canadian federal and British Columbia provincial governments to obtain Treaties that officially recognize their inherent rights and title for long-established traditional territories in the region. The official term for these communities in Canada is “First Nations”, and they have a jurisdictional status deemed to be equivalent to that of the federal and provincial governments. This phrase and/or the names of the individual Nations and their communities are used throughout this report. The overarching theme for significant changes underway in this biosphere reserve region for the past 20 years or so is the continued evolution of governance as Treaty and related agreements are being reached.

The Clayoquot Sound Biosphere Reserve on the West Coast of Vancouver Island covers a geographic area that contains the *ha'houlthee* (chiefly territories) of the **Ahousaht**, **Hesquiaht** and **Tla-o-qui-aht** First Nations and their communities (**Maaqutisiis**, **Hot Springs Cove**, **Hesquiaht Harbour**, **Esowista**, and **Opitsaht**), as well as the District and Village of **Tofino** and part of "Area C" of the **Alberni-Clayoquot** Regional District. The Clayoquot Sound biosphere reserve region includes the *ha'houlthee* (chiefly territories) of the **Ucluelet** (Yuu-tluthiaht) and **Toquaht** First Nations and their communities (**Ittatsoo** and **Macoah**), as well as the District Municipality of **Ucluelet**.

Photo interlude

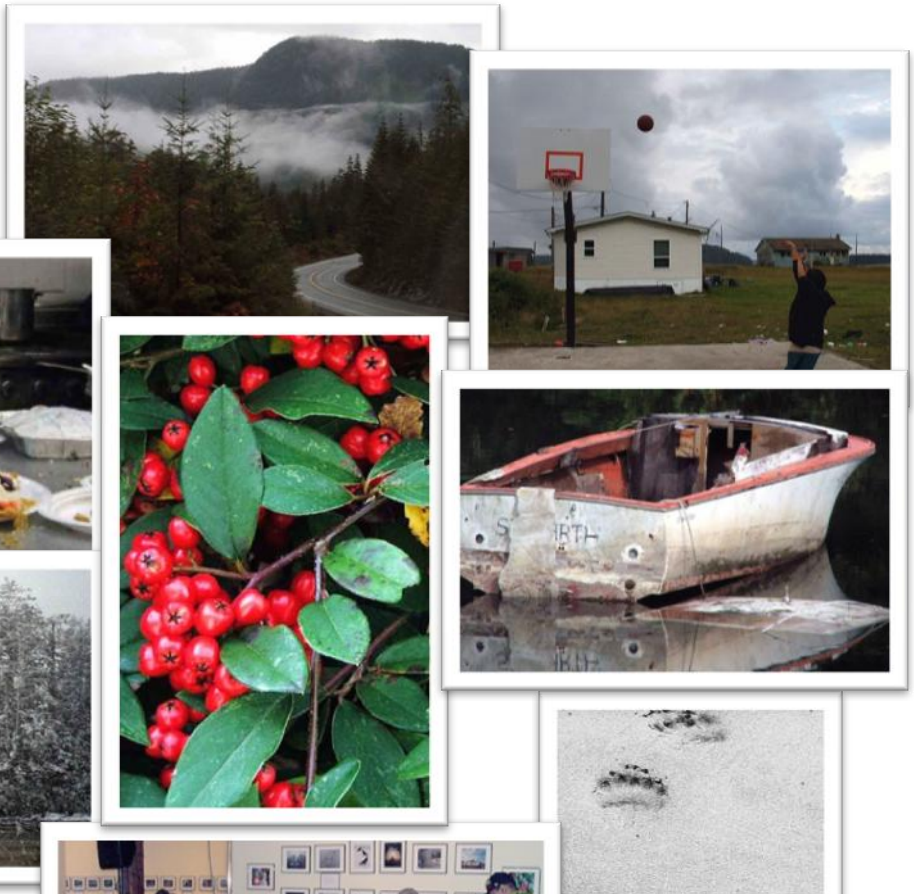
The following collection of photos is intended to provide readers with a sense of the diversity and beauty of places and people within the biosphere reserve region, and of the reviewers' brief visit to the West Coast. Many thanks to those who provided photos and permissions to use them here. *Please note: These photos were permitted to be used for this report <u>only</u> and are not for reuse; some are additionally restricted by copyright.*

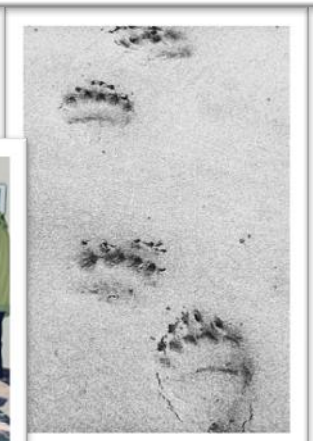


The work of the Clayoquot Biosphere Trust
Interpretive materials, signage and office
Above: the 2008 Canadian Biosphere Reserve Association meeting, hosted by the CBT and Mount Arrowsmith Biosphere Reserve Foundation

Perspectives from Nuu-chah-nulth youth

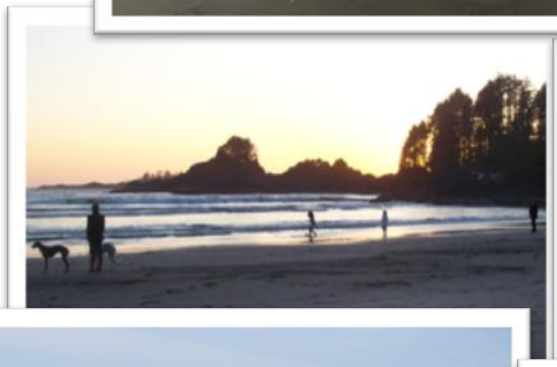
Photo credits: First Nations Youth Photography Club and Make It Happen Society
Photos by: Evelyn Brown (road to Tofino, salal), Dawn Webster (pie pans in Ahousaht's Thunderbird Hall, eagle's path, bear prints, boat taken during the Ahousaht Clean Harbour Project), Cora Crow Shoe (snowy trees), and Cameron (basketball in Opitsaht)

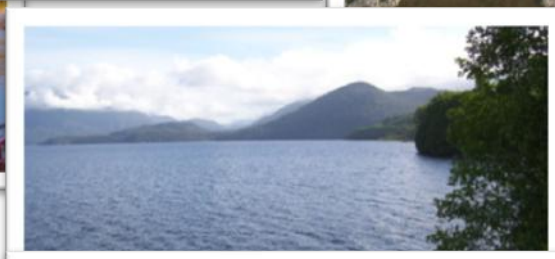


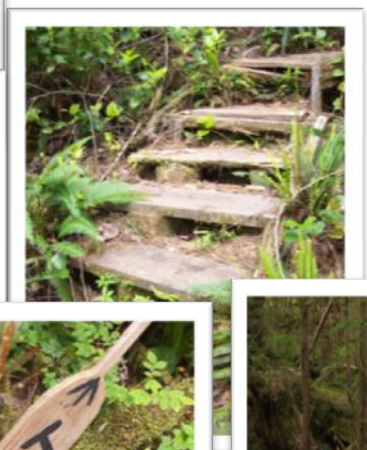


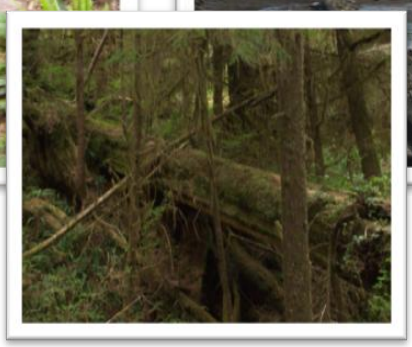
The Club has been profiled in the Canadian Geographer and had several exhibits, including 'Through Our Eyes' that toured to several locations and 'Sacred Spaces', featured at the Indigenous Film Festival in tandem with the Ethnobiology Conference that took place during the on-site visit for the periodic review. The Club sells photo cards to raise money for equipment and activities that include workshops, competitions, exhibitions, and trips. The CBT has provided two small grants to the Make It Happen Societv.

Hooksum Outdoor School *Photo credits: Karen Charleson, www.hooksumschool.com*









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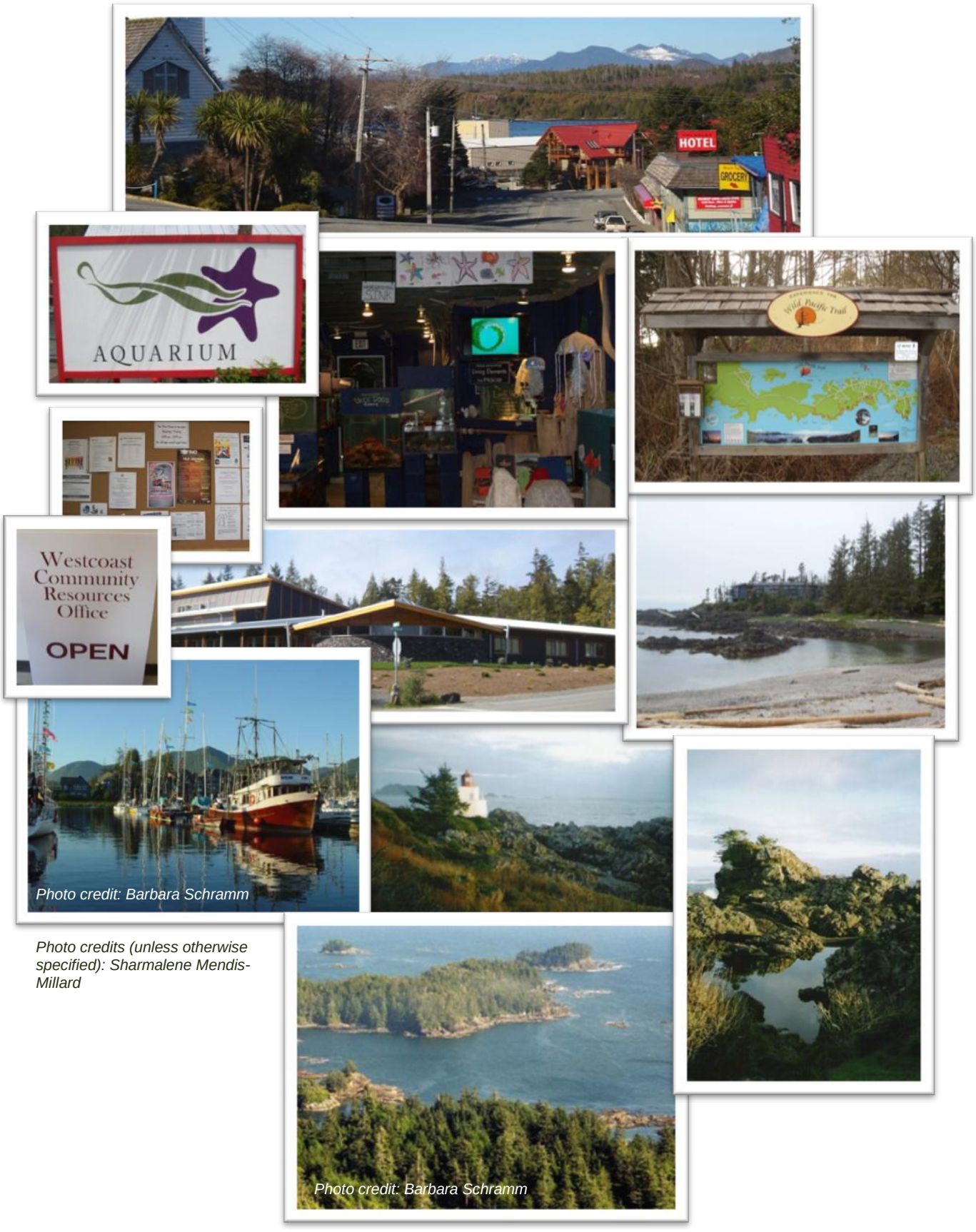
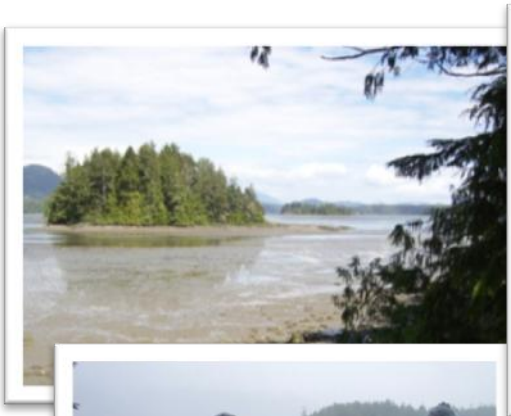


Photo credits (unless otherwise specified): Sharmalene Mendis-Millard

A Sense of the West Coast –Barkley Sound and Ucluelet



Conservation and monitoring
Photo credits (unless otherwise specified): Sharmalene Mendis-Millard

Wildlife photos: Barbara Schramm

Stream restoration by the Central Westcoast Forest Society
Removing debris jams from historic logging activities, which rehabilitate spawning and rearing habitat. Photo credits: Jessica Jean Hutchinson. Crew members: Levi Sutherland (Ahousaht Nation) and Charles Mack (right, Toquaht Nation)

***Clayoquot Symposium 2003**: Clayoquot Alliance for Research, Education and Training (CLARET)*

2008 Forestry Forum, organized by the CBT Terrestrial Committee

A slice in time: the onsite visit for the periodic review

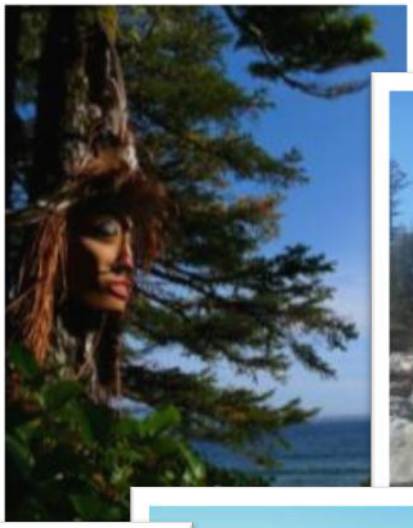
This included an international conference on Ethnobiology, an information meeting on the proposed mining on Catface mountain, mid-stream renovations to the Wickanninish Interpretive Centre, the CBT AGM.

Photo credits, unless otherwise specified: Sharmalene Mendis-Millard. CBT meeting (above): Jean Wylie

Sustainable livelihoods, social services and cultural experiences

These photos depict various forms of tourism (whale watching, storm watching, cultural tourist experiences), aquaculture and social services. Of note are the dug-out canoes carved by Joe Martin of the Tla-o-qui-aht First Nation

Photo credits (unless otherwise specified): Sharmalene Mendis-Millard



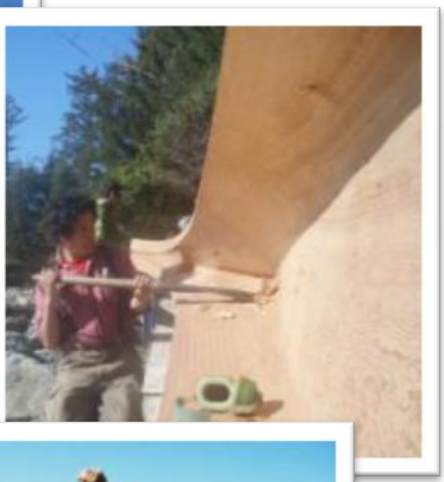


Photo credits:
Barbara Schramm
www.longbeachmaps.com

Photo credit: Jeremy Koreski

Tla-ook Cultural Adventures (www.tlaook.com)

SECTION 2.

Significant changes in the biosphere reserve in the past ten years

2a. Brief summary overview

Narrative account of important changes in the local economy, landscapes or habitat use, and other related issues. Note important changes in the institutional arrangements for governance for the biosphere reserve area, and changes (if any) in the coordinating arrangements (including the local biosphere reserve organization) that provide direction for the biosphere reserve. Note the role of local biosphere reserve organization in initiating or responding to these changes.

Over the past decade or more, forest and watershed management have been subject to the terms set out by the 1995 ***"Scientific Panel for Sustainable Forest Practices in Clayoquot Sound"*** (otherwise known as the '***Science Panel'***). The ***Science Panel*** recommendations included requirements for co-management governance arrangements (by institutions, with equal representation from Nuu-chah-nulth First Nations communities and from non-First Nation communities) to provide direction and approvals for forest practices. Forest practices are to be based on watershed and site-level, constraint-based selective logging in 14 watershed units in place of the former volume-based cuts over large areas under terms set out by provincial Tree Farm Licenses. This change has required a long phase-in period because basic inventories were needed first before watershed plans could be prepared; 11 plans have been completed to date.

The previous large industrial forest corporations are now gone from the biosphere reserve. They have been replaced by **Ma-Mook,** a company owned by the Central Region First Nations that controls two operating companies, each with partners and contractors, who practice variable retention logging. Variable retention logging requires a careful selection of individual large trees that are then removed by helicopter to barges along the coast to reduce reliance upon logging roads. The barges transport the logs to several regional sites for processing. Watershed restoration work (e.g., by the **Central West Coast Forest Society (CWCFS)**) has removed logging debris that had blocked some salmon spawning streams as a result of massive slumps of eroding clear cut hillsides and

associated waste wood and stumps into some valleys following the large forest operations of earlier decades.

An innovative, ecosystem-based forest monitoring system that includes a review of the 1995 ***Science Panel*** recommendations is being considered by the **Clayoquot Biosphere Trust (CBT)** with **Ecotrust Canada**, a non-governmental organization that manages the ***Clayoquot Forest Communities Program, (CFCP),*** which is part of **Canada's Model Forest Network**. **Ecotrust Canada** is a champion of a "conservation economy" alternative or complement to purely market-driven development. As explained (on its website, http://ecotrust.ca/):

> We are driven by the triple-bottom-line, where economic opportunity improves rather than degrades social and environmental conditions. Some people call it sustainability – we call it the conservation economy. A conservation economy provides meaningful work and good livelihoods, supports vibrant communities and the recognition of Aboriginal rights and title, and conserves and restores the environment. **Ecotrust** Canada builds the capacity of communities, institutions and businesses to participate in the conservation economy; raises and brokers capital to accelerate the transition to a conservation economy; and connects conservation entrepreneurs to each other, and to the marketplace. We champion the conservation economy.

Collaborative planning and management for finfish and shellfish have been carried out under terms agreed upon by **West Coast Aquatic** with **Fisheries and Oceans Canada** and various organizations, including **Uu-a-thluk** (meaning 'taking care of') that enables 15 Nuu-chah-nulth First Nation communities to work collaboratively with other governments and groups. A number of small-scale fisheries have been created along the coast. Commercial aquaculture enterprises in Clayoquot Sound are being carried out in cooperation with First Nations by a Norwegian owned corporation (for Atlantic salmon) and a smaller local company (for Chinook salmon). Some aspects of aquaculture operations have been contentious.

Market-driven tourism has created a number of destination tourism complexes and much private development along the 42 km coastal road between **Tofino** and **Ucluelet** and, more recently, within the District of **Ucluelet**. One result has been the increasingly fewer points of free public access to either the Pacific coast or to the Clayoquot and Barkley Sounds. Crowding is common during the peak summer periods. First Nation communities

are becoming more involved in some of these developments. This intensive development has reportedly generated some negative impacts on terrestrial and marine ecosystems, and problems for local municipalities in supporting the infrastructure facilities needed for large numbers of seasonal tourists and the social services to help cope with growing inequalities. A regional economy that has become overly dependent on this one economic sector is itself quite susceptible to disruptions from external events.

Treaty negotiations with First Nation communities have been underway throughout much of British Columbia since about 1993. The **Nuu-chah-nulth Tribal Council** represents 12 different bands whose traditional territories include the western mountain slopes and coastal zones of Vancouver Island, including five communities located entirely in or adjacent to the official biosphere reserve boundary. At the time of this periodic review, two of the five First Nations, **Toquaht** and **Ucluelet**, had reached and ratified a Final Agreement as Maa-nulth First Nations whose territories extend throughout Barkley and Kyuquot Sounds. The **Tla-o-qui-aht** First Nation has negotiated an incremental process whereby issues that have been agreed upon are being acted upon while the remaining issues continue to be discussed. Following a November 2009 British Columbia Supreme Court decision in their favour concerning commercial fishing (that is being appealed by the federal government), **Ahousaht** and **Hesquiaht** unilaterally declared their rights and title to traditional territories. These outcomes have resulted in much more authority and recognition for the First Nations in governing arrangements within the biosphere reserve and surrounding region.

The **CBT** is the administrative authority for the biosphere reserve and is charged with promoting the spirit and intent of the UNESCO biosphere reserve mandate. It has gone through a long period of organizational development and informal network building within the region. This process was supported by numerous small grants it was able to make from revenues obtained from a $12 million endowment fund from the federal government. Over the past 8 years, it has been building collaborative joint ventures with partner organizations in the Clayoquot Sound region.

2b. Updated background information about the biosphere reserve

(The section ¶ numbers here refer to the Biosphere Reserve Nomination Form, February 2004 version. Please identify changes or corrections that may be needed in the information pertaining to the following.)

2b (i) Zones

Size and spatial configuration (¶ 7). Composition of core areas, buffer zones, and/or extent of transition area

Core areas: Core areas include the Pacific Rim National Park Reserve (Long Beach Unit), western portions of Strathcona Provincial Park and 16 other sites designated by the British Columbia Clayoquot Sound Land Use Decision in 1993. Terrestrial core areas constitute 90,180 hectares and marine core areas include 20,104 hectares, for a total of 110,288 ha in the biosphere reserve. Please see Section 3b for details.

Buffer zones: Buffers include "all major watersheds in which little (less than 2% of area) or no logging or other industrial activity has taken place". Here, the buffer zone includes 58,309 hectares for which watershed plans are to be prepared and the **Tofino** Mud Flats Wildlife Management Area, for a total buffer zone of 60,409 hectares.

Transition area: This includes a terrestrial component of 116,557 hectares that includes: the *ha'houlthee* (chiefly territories) of the **Ahousaht**, **Hesquiaht** and **Tla-o-qui-aht** First Nations and their communities (**Maaqutisiis**, **Hot Springs Cove**, **Hesquiaht Harbour**, **Esowista**, and **Opitsaht**); the District of **Tofino**; private land outside of municipal boundaries; lakes; islands; major watersheds in which significant logging or other industrial activity has taken place (some of which are included in watershed plans); and, 62,693 hectares of non-core and non-buffer marine areas, for a total area 179,250 ha.

The total size of the biosphere reserve is 349,947 hectares. It does not include most of the traditional lands of the **Ucluelet** (Yuu-tluthiaht) and **Toquaht** First Nations and their communities (**Ittatsoo** and **Macoah**) in the Barkley Sound region or the District of **Ucluelet**. Since these Nations and District Municipality are represented on the **CBT** Board of Directors, interest has been expressed by the **CBT** in expanding the transition area to include these adjacent areas within the biosphere reserve region.

2b (ii) Human population of the biosphere reserve

Human population of the biosphere reserve (¶ 10). Most recent census data (e.g., 2006)

Statistics Canada census information:

Three census data units cover the districts and municipalities while five cover First Nation communities whose territories are entirely or partly within the biosphere reserve. The data for the 2001 and 2006 censuses are given below, along with the registered population of First Nations people on reserves and in total as of 2008.

Table 1: Population of the Clayoquot Sound Biosphere Reserve and its Region

	2001	2006	2008, registered on reserve	2008, total registered Band members
Hesquiaht, 5 sites	77	120	179	657
Ahousaht, 25 sites	557	661	660	1,851
Tla-o-qui-aht, 10 sites	288	335	323	926
Toquaht, 7 sites	10	19	8	115
Ucluelet, 9 sites	208	200	311	618
Total, Central Region First Nations communities	**1,140**	**1,335**	**1,481**	**4,167**
First Nations people living in Tofino, Ucluelet and Alberni-Clayoquot District "C"	310	320		
Tofino, Municipality	1,466	1,655		
Ucluelet, District	1,559	1,487		
Alberni-Clayoquot "C", Regional District	369	401		
Total, non-indigenous communities	**3,394**	**3,543**		
MODIFIED TOTALS	**2001**	**2006**	**2008**	**2008**
Non-First Nation residents	3,084	3,223	3,425*	3,425*
First Nation residents	1,450	1,638	1,481	4,167
Total population	**4,534**	**4,861**	**4,906****	**7,592****

Source: Statistics Canada and BC Ministry of Aboriginal Relations and Reconciliation
*Projected estimates for Tofino and Ucluelet only
**Includes projected estimates

Population numbers appearing on various websites can differ for several reasons. One concerns the size of First Nations populations if the official registered total population is used instead of the number of residents actually living in the communities. The registered total community (Band) size is the number of people officially recognized to be full members of the First Nation communities (i.e., "Status Indians"). Most live "off-reserve" at any given time, many of them permanently. For 2001, the recognized First Nations numbers totaled 3,859 people, which increased to 4,167 people in 2008. The proportion of First Nations to other people in the resident population of the biosphere reserve area has remained about one-third over the past decade. Some earlier statements suggested the proportion was about 50:50, which are repeated from time-to-time.

The difference may also reflect the tourism-related growth in the three main Districts. Estimates in 2008 suggested the population of **Tofino** to be 1,829 and **Ucluelet** to be 1,596, with a total non-First Nation population of 3,425 people. This number alone is higher than the total population the biosphere reserve was thought to be at the time of the 1999 nomination. It should also be noted that the volume of summer visitors swells these numbers considerably, with estimates ranging in the order of 20,000 people in **Tofino** on peak summer days.

2c (iii) Climate

Most recent 30 year climate normals for weather stations in the biosphere reserve (¶ 11.3).

Table 2: Climate statistics for Tofino "A" weather station

Station ID*:	**1038205**
Location:	49° 04'N 125° 46'W
Elevation:	24.5m
Average temperature of the warmest month	14.8 °C
Average temperature of the coldest month	4.5 °C
Mean annual precipitation	325.7 cm (of which 42.8 cm is snow)

*This station meets the World Meteorological Organization standards for measuring temperature and precipitation. The data are the most recent "30 year normal" for the years 1971-2000.

Information on possible climate change in Clayoquot Sound is anecdotal and quite provisional since so much depends on changes underway in the Pacific Ocean. **Ecotrust Canada's** Phase 1 overview (2010) of community-based climate change adaptation for three First Nations communities in Clayoquot Sound included perceptions of climate change from 28 long-term (40-60 years of age) residents. They reported many changes. Summers are hotter (up to 30^{o}C) and longer than before, with less frequent occurrences of rain (and lightening) but heavier rains when they do come. Lake levels are noticeably lower (e.g., in Kennedy Lake) and snow no longer remains on the tops of the mountains all summer. Winters are milder with not as much ice; ice that does form can no longer be walked or skated on. Migrating birds arrive earlier and stay longer than they used to do.

The Phase 1 overview also gave ***Climate BC*** projections for Clayoquot Sound compared to the 1961-2000 mean annual temperature of 7.8^{o}C (with a winter average 1.9^{o}C and summer average of 14.2^{o}C) and mean annual precipitation of 4,078 mm. These data for the larger area differ somewhat from the low elevation records from the **Tofino** "A" Station. Projections for the 2020s, 2050s and 2080s from two plausible scenarios based on different carbon emission possibilities indicate average summer temperatures ranging to about 15.1^{o}C, 16.1^{o}C and 18.1^{o}C and average winter temperatures ranging to about 2.8^{o}C, 4.1^{o}C, and 5.7^{o}C during these three periods. Mean annual precipitation levels could range up to 4,231, 4,660, and 5,047 mm in the same periods.

2b (iv) Biological characteristics

Biological characteristics (¶ 12). Note briefly here or refer to 3a below.

There are no significant changes in the basic biological characteristics of the biosphere reserve as described in the original nomination document. Remedial measures to promote sustainable uses of forests and watersheds are being implemented along with site-level ecological restoration, especially in the Kennedy Lake area. These are described in Section 4.

2b (v) Development function

Development function (¶ 14). Note briefly here or refer to 4 a,b,c below).

There are a wide range of development initiatives being taken for improved resource stewardship in the forestry, watersheds, fisheries, and eco-tourism sectors. Mass tourism, aquaculture and mining are entirely market-driven. Community economic development is mainly to support tourism-related development and some initiatives are directed to more localized, community-based "conservation economies" alternatives. Please see Section 4.

2b (vi) Logistic support function

Logistic support function (¶ 15). Note briefly here or refer to 5a,b, below).

There are extensive collaborative programs and initiatives that strive to build community capacity in most socio-economic sectors. Please see Section 5.

2b (vii) Institutional aspects

Institutional aspects (¶ 17) Changes (if any) in hierarchy of administrative divisions.

Governance for sectors covered by the ***Science Panel*** recommendations (1995) in the biosphere reserve is generally organized by co-management arrangements, with equal representation from First Nations communities and from other governmental bodies. Decisions are sought through consensus, but should a vote be deemed necessary then a double majority rule is required. The **CBT** has a similar arrangement. At the same time, the Treaty negotiation processes, underway since 1994, set both the larger context and pace within which major programs and projects unfold. As final agreements are reached, they are setting the basis for a significant restructuring of regional and local governments in the years ahead. For details, please see Section 6.

2c. The biosphere reserve organization and / or associated group(s)

Comment on the following topics that are of special interest in the experience of the Canadian network.

2c (i) Cooperation plans and statements of vision, goals and objectives

Cooperation plan (or up-dates), including vision statement, goals and objectives (current or for the next 5-10 years).

Statements about a vision and goals were prepared within the first year of the biosphere reserve's designation and the CBT's formation. The first three-year business plan outlined activities for 'building' (2001), 'sharing' (2002) and 'learning' (2003). Three-year plans with budgets are up-dated annually and approved by the **CBT** Board. The current vision is of a biosphere reserve region that

> will live sustainably in a healthy ecosystem, with a diversified economy and strong, vibrant and united cultures while embracing the First Nations 'living philosophies' of *Iisaak* (Living respectfully with a degree of humility), *Qwa'aak quin teechmis* (Life in the balance with everything else), and *Hishuk ish ts'awalk* (Everything is one and interconnected).

The **CBT** mission is to assist the biosphere reserve region to achieve its vision by providing funds and logistical support for research, education and training activities that promote conservation, sustainable development and healthy communities. As an organization with charitable status, the **CBT** strives to accomplish these goals and objectives by working creatively and proactively within the framework of UNESCO/MAB.

2c (ii) Budget and staff support

Budget and staff support including approximate average annual amounts (or range from year-to-year); main sources of funds; special capital funds (if applicable); number of full and/or part-time staff; in-kind contribution of staff, facilities or equipment; volunteer contributions of time or other support.

Funding comes almost entirely from a $12 million endowment fund established by the federal government through **Environment Canada** in 2000 for use by the CBT. The fund is managed by Vancouver-based **Genus Capital Management** and is invested using a Socially Responsible Investment (SRI) screening that has been developed and updated

by Genus. The fund is managed with guidance from an investment committee mandated by the ***Canada Agreement*** (that set up the fund) and is comprised of industry specialists who act as **CBT** investment advisors. This committee meets with Genus twice a year. Generally, except for small amounts of cash and near cash, the portfolio is invested 50:50 between bonds and stocks but with the ability to go 40:60 based on market conditions, and with about one-half of each type of investment issued by Canadian institutions. The Fund is legally obligated to maintain the equivalent level of the original $12 million over the life of the Fund by including annual cost-of-living adjustments, based on the Consumer Price Index, for inflation. The equivalent required level of the Fund in 2010 would be $14.7 million. The Fund has fluctuated between about $11.2 million and $15.3 million during the past decade. It was seriously undermined by the 2008 global financial debacle that reduced it to about $12.8 million, and had previously been affected by the 2001 economic downturn. During the past year or so it has been recovering, and was valued at $13.1 million at the time of the periodic review. (This meant it was still about $1.6 million short of its formal obligation over the life of the fund.)

Earnings from the fund have been in the order of $550,000 to $600,000 annually. Monthly withdrawals are made to cover the overhead and operating expenses of the **CBT**, and quarterly withdrawals are made to pay for management of the Fund. For the fiscal 2009-2010 year, Genus reported withdrawals of $480,000 for the **CBT** and $46,100 for management of the Fund for a total withdrawal of $526,100. The audit for the calendar year ending on December 31, 2009 showed expenditures totaling $563,100 for the **CBT's** operations and project contributions. The current Executive Director, hired in July 2008, has trimmed expenses including those for projects.

The **CBT** also solicits funds for joint projects in partnerships with other organizations. An early example was a collaboration between the **CBT** and the **University of Victoria** to secure $220,000 annually for an initial three years, followed by a two-year extension for a Canadian University Research Alliance (a CURA project called the ***Clayoquot Alliance for Research, Education and Training (CLARET)***, noted elsewhere in this report) funded by the Canadian Social Sciences and Humanities Research Council (SSHRC). In 2002, the **CBT** was also successful in negotiating a federal grant of $100,000 for three years to fund the ***Iisaak Sustainability Project*** as a part of CLARET. This practice of seeking joint projects continues, as exemplified by the recent jointly funded ***Clayoquot***

Socioeconomic Report, 2009, by **CBT** and **Ecotrust**. In the past year, the **CBT** has developed several projects in the $10,000 to $20,000 range through additional fund-raising and partnerships.

The charitable status of the **CBT** was suspended in 2004 for a technical reason, and was re-instated as a result of the work of the Interim and current Executive Directors in June 2008. The **Canada Revenue Agency** determines the types of organizations that can receive funding from a federally-registered charity. The **CBT** has occasionally hired organizations or individuals to deliver projects or programs that support the mandate of the biosphere reserve. Details of the current administrative rules were being prepared for posting on the **CBT** website at the time of this periodic review. There is some concern among local groups in the region that no longer qualify for funding through the **CBT's** call for projects because they lack charitable status, and that work by the **CBT** advisory committees, which has primarily concerned funding small-scale local initiatives, might become difficult to maintain. About 80 volunteers have served on up to five advisory committees over the years and the **CBT** has found their efforts to be very helpful.

Salaries and related expenses for the Executive Director and for one or two full-time equivalent (FTE) staff for the **CBT** are covered by these withdrawals from the Fund. During the past two years, the **CBT** has hired an additional staff person who is supported by other external funding. In addition, up to about $100,000 annually (reduced to ~$70,000 this past year) is used for grants to support capacity-building projects and events. Please see Section 6 for information on the **CBT's** programs.

2c (iii) Communications strategy

The biosphere reserve's communications strategy including different approaches and tools geared towards the community and/or towards soliciting outside support.

The **CBT** maintains an up-to-date and informative website and produces information brochures from time to time. Its main approach is direct involvement in community network initiatives. It has not solicited much outside support for communications, with the exception of providing funds to the **Raincoast Education Society (RES)** to develop interpretive posters about the biosphere reserve designation (shown in the Photo

Interlude). The Executive Director plans to revise the website to place more emphasis on the biosphere reserve and the work taking place under the UNESCO designation and less on the Trust and the Endowment Fund. The struggle to address issues related to the fund and its management while fulfilling the varied expectations of a biosphere reserve has been ongoing since the announcement of the fund in May 2000.

2c (iv) Strategies for fostering networks of cooperation

Strategies for fostering networks of cooperation in the biosphere reserve that serve as connections ("bridging") among diverse groups in different sectors of the community (e.g., groups devoted to agricultural issues, local economic development, tourism, conservation of ecosystems, research and monitoring).

The main strategies have been informal brokering and facilitation to develop networked relationships. These have been supported by some funding for science symposia, feasibility studies, pilot projects, and organizing community events to share project experience. The **CBT** also promotes selective capacity-building through the creation of its advisory committees and funding learning opportunities, especially for youth. It does not engage in lobbying or long-term operations of programs, given its charitable status.

2c (v) Role in addressing social and cultural issues

Particular vision and approaches adopted for addressing the socio-cultural context and role of a biosphere reserve (e.g., promotion of local heritage resources, history, cultural and cross-cultural learning opportunities; cooperation with First Nations; reaching out to recent immigrant groups, etc.).

The **CBT** has played a role in helping to address social and cultural issues in the biosphere reserve region, and can play a role in developing co-management approaches and capabilities in the biosphere region. It stresses the need for agreed protocols for conducting research in and with First Nations, noting in particular the ***Standard of Conduct for Research*** developed by ***CLARET*** in June 2003. The **CBT's** Culture (Advisory) Committee considers appropriate and effective ways to support events and projects of importance for First Nations communities. The **CBT's** activities are set in the larger context of Treaty negotiations and outcomes. Please see Section 6c for details.

2c (vi) Obstacles and challenges

Obstacles encountered by the biosphere reserve or challenges to its effective action.

One challenge is to develop the capabilities to carry out the main functions of a biosphere reserve in the context of evolving governance institutions in the region. It has been, and continues to be, a slow process requiring much patience and determination in the face of delays, occasional setbacks, and conflicting ideas within the region and sometimes within the **CBT** Board of what the designation means and the role, purpose, activities, and priorities of the **CBT**. In earlier years, these conflicts sometimes invoked procedural wrangling and disputes over personal or historical issues. These in turn deferred or prevented decisions and appointments to the Board, or otherwise hampered its functioning. The Board reports that it now operates in a much more collegial manner.

2c (vii) Other

Please see Appendix 2 for information about the projects funded by the **CBT** over the past decade. This is the only summary information for the decade of projects that was readily available for the periodic review. The **CBT** archives contain considerable amounts of information including project applications, final reports and other materials from particular projects. This information could be used to prepare a number of different narratives about local initiatives and outcomes generated by collaborative work over the years. Projects and funding could also be listed in different ways, such as by community, core priority (e.g., see Appendix C of the ***Analysis of the CBT Core Priorities***, prepared by Ms Mendis-Millard in July 2008) or UNESCO mandate. Some of this information could be incorporated into communication strategies that would give the larger public a much better understanding of what the biosphere reserve actually does and where the funding goes.

2d. Matters of special interest

Comment on the following matters of special interest in the experience of the Canadian network as it relates to this biosphere reserve. Refer to other Sections below where appropriate.

These matters refer to: management plans; the work of the biosphere reserve organization; zonation appropriateness; how "sustainability" guides programs; scientific work linked with national and international programs; issues arising from cross-scale relationships; strengthening collective capacities for governance; and, the continued justification for the region to be designated as a biosphere reserve.

2d (i) Management Plans

Effectiveness of management plans of government agencies and other organizations in the biosphere reserve. Brief note about plans that have been completed or revised in the past 10 years.

Substantial work has gone into the preparation of watershed plans that were overseen by the **Central Region Board** for the implementation of the 1995 recommendations of the ***"Scientific Panel for Sustainable Forest Practices in Clayoquot Sound"***. These required applying principles of constraint-based forest management to protect a range of forest and watershed values to be applied at both the watershed and site levels. Logging then has to be highly selective in order to retain forest cover necessary for ecosystem-based management that respects cultural, spiritual, recreational, and scenic values. Plans have been completed for 11 of 14 watersheds. These plans now guide the two main forest corporations, both owned and controlled by the Central Region First Nations.

With the **Moore Foundation** funding received in 2008, **West Coast Aquatic**, a collaborative forum for dealing with marine and coastal issues along a 300 km stretch of the outer coast of Vancouver Island, initiated a coastal zone planning process. It is initially giving special attention to Barkley Sound, immediately south of Clayoquot Sound, but will also address the Clayoquot Sound once planning for the former is underway.

In response to tourism growth and pressures, the Districts of **Tofino** and **Ucluelet** have strengthened their municipal planning capabilities; **Ucluelet** has gained both local and international recognition for its innovations in community involvement, for design for development and re-development, and for requiring developers to pay for local infrastructure. Other sectors, notably tourism, aquaculture, and mining are largely market driven by private sector interests.

In 2008, the **CBT** refined its priority setting and guidelines for funding local research, monitoring, and education and training activities by organizing them under the themes of *Connecting People and Place, Practicing Sustainability, and Building a Biosphere Centre*.

2d (ii) The local biosphere reserve organization

Continued local involvement in the work of a biosphere reserve

The **CBT** is structured as a co-management Board with 10 Directors and their Alternates from the First Nations and other communities, and 4 Ex-Officio members from the **Department of Fisheries and Oceans, Environment Canada, Parks Canada**, and the **Province of British Columbia**. In addition, the Board has five local advisory committees organized around the following themes: Common Ground (previously Community development); Culture; Education; Marine and Aquatic; and, Terrestrial. These committees bring together diverse people who work for government agencies, non-governmental organizations, First Nations, and educational institutions, but they participate out of personal interest rather than as representatives for their organization or community. Some committees have sponsored local consultations and forums on issues such as current and future forestry plans and practices, restoring Pacific salmon, and engaging youth. Besides guiding the **CBT's** work, and with due regard for potential conflicts of interest, the committees approve and sometimes carry out small projects funded in part by the CBT's fund. These are in addition to projects funded directly by the **CBT** in response to the annual call for proposals.

2d (iii) Appropriateness of the current zonations

The official "core areas" constitute about one-third of the biosphere reserve, and buffer zones constitute about another one-quarter of it. From a biosphere reserve perspective, this is appropriate. Criticisms about the insufficiency of these areas alone to protect old growth forest ecosystems has come mainly from people who argue that preservation issues must be considered in the context of Vancouver Island itself as the proper scale for determining conservation needs. Local, national and international interest groups also argue that protecting the last remaining old growth forests in the Northern hemisphere outweighs short-term economic benefits from exploiting them. These concerns extend well beyond the biosphere reserve region to other geographical areas in the world.

In 1984, the **Tla-o-qui-aht** First Nation *Hawiih* (Hereditary Chiefs) declared Meares Island a ***Tribal Park.*** In 2007, the **Tla-o-qui-aht** First Nations began to formally develop and apply the ***Tribal Park*** concept for the watersheds within their traditional territories, which covers about 15% of the biosphere reserve and applies a quite different cultural tradition for respectful use of the territories than the one introduced by colonization. The **Tla-o-qui-aht** First Nations have partnered with the District of **Tofino** to pursue a ***joint sustainability planning*** process and with **Parks Canada** on a ***Tribal Parks Establishment Project*** that is initially focusing on *Haa'uukmin* (Kennedy Lake watershed). While some configurations of land and water use may require resolving differences of interpretation at particular sites, the ***Tribal Park*** vision, mission and principles are consistent with the biosphere reserve concept, and could prove to enrich the biosphere reserve status of Clayoquot Sound.

2d (iv) "Sustainability" as a deliberate guiding theme for programs in the biosphere reserve

"Sustainability" is a key concept that the **CBT** fosters. The concept has also been widely adopted by governments, agencies, organizations, and groups as a rationale for much that is being done in the biosphere reserve and region. The First Nations are leading with their model of socially sustainable resource use based on fundamental cultural principles guiding human relations with the world. In its vision, the **CBT** deliberately embraced the

Nuu-chah-nulth philosophies of *Iisaak*, or living with respect and humility, *Qwa' aak qin teechmis,* or life as a balance among all things, and *Hishuk ish ts'awalk,* or everything is one and interconnected. **Ecotrust Canada** and its partner organizations are striving to develop a viable "conservation economy" as the strategy for "reliable prosperity" in the biosphere reserve (and elsewhere). **West Coast Aquatic** and its **Tsawalk Partnership**, the **Tofino Botanical Gardens Foundation** (with its ***Sustainability Camp***) and the **Raincoast Education Society (RES)** are just a few of the organizations whose programs are guided by the concept of sustainability, even if they do not use the word itself.

2d (v) Scientific work linked with national and international programs

Particular scientific work linked with national and international programs (e.g., Environment Canada's Ecological Monitoring and Assessment Network (EMAN), EuroMAB, IUCN – World Conservation Union).

The research and related activities supported by the **CBT** includes a link to the (former) **Environmental Monitoring and Assessment Network (EMAN)** through a salmonberry monitoring project maintained by ***"PlantWatch",*** a joint venture between **Environment Canada** and **Nature Canada.** Work is underway by several organizations to document the occurrences of "species-at-risk" in the biosphere reserve. These are species identified by the ***Committee on the Status of Endangered Wildlife in Canada (COSEWIC)*** convened under the Species at Risk Act (S.C. 2002 c.29) and under similar provisions in the Wildllfe Act of British Columbia (RSBC 1996 c.488). This work also contributes to the goals of the ***UN Convention on the Conservation of Biological Diversity (CBD).***

Some programs carried out by agencies and organizations in the biosphere reserve region have international components. For example, much of the fisheries and oceans work directed by the federal **Department of Fisheries and Oceans**, including research related to it, is guided by international agreements such as: the Canada-United States Salmon Treaty, 1985; the UN Agreement on Straddling Fish Stocks and Highly Migratory Species, 1995; and, the FAO Code of Conduct for Responsible Fisheries, 1995. Forest sector initiatives have sought and received Forest Stewardship Certifications (e.g., **Iisaak Forest Products**, in 2001). The 2008 ***Forest Communities Program*** funded by the

Canadian Forestry Service to promote sustainable forest management is consistent with principles discussed by the ***UN Forum on Forests***. The Forum has been following sustainable forestry guidelines adopted by the 1992 ***UN Conference on Environment and*** Development and has been striving to reach some North-South agreement on a Forestry Convention that the United Nations can endorse.

The First Nations are well aware of the ***UN Declaration on the Rights of Indigenous Peoples*** adopted by the General Assembly in 2007 by 143 countries (with Canada being among the four who opposed it). They reserve a right to appeal to this for the publicity it might yield, but seem reasonably satisfied that progress under Treaty negotiations, and especially through the **Central Region Board,** have generally been consistent with the Declaration so far. Nuu-chah-nulth representatives sometimes attend sessions of the ***UN Permanent Forum on Indigenous Issues.***

At the local scale, a number of groups in the biosphere reserve region have informal links with groups elsewhere that share the same interests. In some cases, this seems to have come about because of the extensive international attention drawn to Clayoquot Sound by the major disputes and civil disobedience campaigns of the late 1980s and early 1990s, in which some of these groups participated. Programs initiated by **Ecotrust** (itself drawn to the region by the earlier disputes) have attracted international attention; an example is the **Ecotrust** ***"Aboriginal Mapping Network"*** that began as a GIS approach to mapping the ***Science Panel*** recommendations for Clayoquot Sound in the mid-1990s but is now an international network among Indigenous peoples in several regions of the world. There is also a growing network of cooperation on studies of marine mammals. The ***Baja California-to-Bering Sea*** initiative is the most ambitious by keeping track of the annual migrations of gray whales as well as other marine species.

A particularly imaginative initiative is the ***"Clayoquot Consortium,"*** a means for engaging academic and government research groups throughout the world to conduct work within the biosphere reserve. Developed by the **Tofino Botanical Gardens Foundation** and based at the **Clayoquot Field Station**, the purpose of the ***Clayoquot Consortium*** is to address the question of, "How do we live in a place: how can human communities thrive without compromising the natural systems upon which they depend?".

The International Congress on Ethnobiology held in May 2010 is an example of this venture and attracted interest from a number of conference participants.

2d (vi) Cross-scale relationships in social-ecological systems

Issues arising from multiple cross-scale relationships inherent in the social-ecological systems (e.g., forests, marine systems; links of key local corporations to global economy; government activities across different levels of federal, provincial, and local jurisdictions).

The issues are mainly to recognize and understand the nature of cross-scale connections and determine what, if anything, might be done to nurture cooperation that would enable mutually-beneficial collaboration to develop. A meshing of top-down with bottom-up collaboration may be essential to accomplish what no one level agency or organization could do on its own. Major corporations in the private sector bring some larger scale ("global") perspectives to bear on their business decisions in the biosphere reserve region (e.g., for mining, destination tourism and aquaculture). The CBT's focus on opportunities within the local contexts of co-management and Treaty issues is such that questions that could arise from "globalization" considerations are not perceived to be within its current mandate by some Directors on the Board.

2d (vii) Strengthening collective capacities for governance

Strengthening collective capacities for the overall governance of the biosphere reserve (e.g., organization of new networks of cooperation, partnerships).

These capacities have been developing for many years, pre-dating the biosphere reserve designation. In part, they resulted from organizations coming together to challenge the former industrial forestry practices on Vancouver Island and especially in Clayoquot Sound. They also evolved from attempts by the provincial government to develop a collaborative ***Clayoquot Sound Sustainable Development Strategy*** (from 1989-1992) that were ultimately unsuccessful, but nevertheless influenced thinking about the issues. (Please also note the governance related papers listed in Appendix 3.)

Over the past 20 years or so, Treaty negotiations have lead towards the development of an effective co-managed re-structuring of governance institutions. Observers have noted that governance has been slowly evolving from what had been a paternalistic, colonialist regime in a "liberal settler state" to one based on a more equitable balance of power and mutual trust that leads to genuine partnerships. The **CBT** has had a small but critical role to play at the local level of initiating and supporting networks through grants for projects and events. The **CBT** has also played a role in facilitating engagement and conflict resolution processes among First Nation communities, governments, industry, and environmental organizations (please see Section 6 for details).

2d (viii) Continued justification for a biosphere reserve

The **CBT** has noted a growing interest in the biosphere reserve by those outside the region, demonstrated by information requests, research visits, on-going funding from some local sources. Many individuals within the region have been engaged with the development of the **CBT** and in its activities, such as the advisory committees, and are passionately committed to continuing to find ways to "live up to" the designation. As the First Nations continue to build their capacities and as trust and respect continues to develop among and within different communities, it can be expected that there will be more opportunities for the **CBT** to lead, facilitate, and otherwise pursue actions that biosphere reserves are meant to foster. It is time now to build on the bases laid down during this first decade.

SECTION 3. The Conservation Function

(This refers to programs that seek to protect biodiversity at landscape and site levels and/or ecological functions that provide ecosystem goods and services in the biosphere reserve. While actions to address this function might be focused on core areas and buffer zones, ecosystem dynamics occur across a range of spatial and temporal scales throughout the biosphere reserve and beyond. Note how these cross-scale phenomena are being addressed.)

3a. Significant changes in habitat and biodiversity

Significant changes (if any) in the main habitat types identified for the biosphere reserve, including natural processes or events, main human impacts, and/or relevant management practices. (The comparison is with the situation described some ten years ago. Refer to habitat types identified in the section on "Significance for Conservation of Biological Diversity" in the first periodic review form, or ¶ 12 in the nomination document).

There have been no significant changes in the main habitat types identified in the past decade, although some have been mapped more clearly (e.g., mudflats and eelgrass beds of the **Tofino** mudflats ecosystem). Earlier human impacts on forests and watersheds in the buffer zones and some of the transition area are being extensively mitigated. The new forest management policies and management practices carried out by **Iisaak** are combined with some ecological restoration work undertaken by groups such as the **Northwest Ecosystem Institute** and the **Central Westcoast Forest Society.**

3b. Conservation programs

Describe the main conservation programs that have been conducted in the biosphere reserve during the past ten years as well as current on-going ones. Note their main goals and the scope of activities (e.g., biotic inventories, species-at-risk, landscape analyses, conservation stewardship actions). Cross reference with other Sections where appropriate.

Park and protected core areas

The core areas of the biosphere reserve are listed in Table 3. The 16 protected areas first proposed by the provincial government's ***Clayoquot Sound Land Use Decision*** in 1993 were subsequently established under the Park Act (RSBC 1996 c. 334). Two small areas

Table 3: Core areas of the Clayoquot Sound Biosphere Reserve

Core Areas	Terrestrial (ha)	Marine (ha)	Status*
Pacific Rim National Park Reserve Long Beach Unit**	7,862	6,763	Interim plan
Strathcona Provincial Park (PP)	58,798	513	3
Megin/Talbot addition, includes Megin Ecological Reserve	(50)		
Hesquiat Peninsula PP	6,689	1,199	1
Flores Island PP	4,144	2,969	2
Clayoquot Arm PP	3,132		2
Clayoquot Plateau PP	3,132		2
Sydney Inlet PP	2,083	691	1
Vargas Island PP which includes Cleland Island Ecological Reserve	1,543 (7.7)	4,262	2
Maquinna Provincial Marine Park	1,215	1,398	1
Sulphur Passage PP	355	1,943	1
Tranquil Creek PP	299		1
Kennedy Lake PP	241		1
Gibson Provincial Marine Park	143		1
Hesquiat Lake PP	62		1
Dawley Passage PP	62	92	1
Epper Passage PP	54	274	1
Kennedy River Bog PP	11		
Sub-total	**90,184**	**20,104**	
	Total: 110,288 ha		

* BC Parks Status: All of the provincial parks and ecological reserves, including the new parks first announced in the 1993 provincial land use decision for Clayoquot Sound, are designated as Class "A" protected areas (afforded the greatest degree of protection) under The Protected Areas of British Columbia Act, SBC 2000, c. 17. Their boundaries have been legally described in 4 Schedules included under this Act. Work is underway to prepare management plans in three stages: 1 = a Purpose Statement and Zoning Plan (PSZP; these were officially approved in 2003); 2 = a project is underway to produce a "Management Direction Statement" (elaborates on the PSZP); 3 = Approved Management Plan.

**Established in 1970 as a National Park Reserve (pending Treaty negotiations). Proclaimed in 2001 under: the updated National Parks Act, SC 2000, c.32; Interim Management Guidelines 1994 apply; and an Ecological Integrity Statement 2001.

originally designated under the Ecological Reserves Act (RSBC 1996, c. 103 for the Megin and Cleland Island Ecological Reserves) are now included within larger provincial parks. As noted below, the legal boundary descriptions for these new parks are given in Schedules under the Protected Areas of British Columbia Act, SBC 2000, c. 17. The official size of a few of these parks varied somewhat from information available for the 1999 biosphere reserve nomination document.

Data from the legal Schedules were used for the biosphere reserve zonations (above). Minor adjustments were made in the size of the buffer zone to retain the same total size (as reported in the 1999 nomination). Each of the new parks has a "Purpose Statement and Zoning Plan" (PSZP) to identify the major roles of the protected areas for conservation of natural and cultural features (mainly archaeological and Aboriginal), and the types of available outdoor activities. They also identify management issues, including coordination with the biosphere reserve concept and organization, and features that are protected under zoning provisions. These PSZP statements, all approved in 2003, are the first step towards preparing formal management plans.

Strathcona Provincial Park, the oldest in British Columbia, has a formal Management Plan and a park advisory committee. The Plan was amended in 2001 with a number of modifications, including the addition of ~27,000 hectares in the Megin-Talbot watershed, one of three intact forested ecosystems in the biosphere reserve that originate in the highlands of the park. Only these three watersheds were included in the biosphere reserve; the park otherwise extends much further east.

The **Pacific Rim National Park Reserve** prepared an "Ecological Integrity Statement" in 2001 as a step toward meeting the statutory requirement (under SC 2000, c. 32, s. 2.1 & 8.2) to give first priority to the protection of the "ecological integrity" of the park. A State of the Park report in 2008 outlined the monitoring for ecological integrity, cultural heritage, and visitor experience. A Management Plan was completed in 2010.4

In addition, the **Nature Conservancy of Canada** acquired a 76 hectare site on Vargas Island in 2001.

Tribal parks

As part of its Incremental Treaty Agreement, 2008, the Tla-o-qhi-aht First Nation has designated the ***Ha'uukmin*** (Kennedy Lake watershed) as a ***Tribal Park,*** covering the 55,000 hectares that comprise the Upper Kennedy River and Clayoquot River watersheds that originate north of the Sutton Pass and flow through rocky forest canyons to Kennedy Lake and then into the **Tofino** Inlet and Clayoquot Sound. The park includes the traditional territory (*Ha'houlthee*) of the **Tla-o-qui-aht** First Nation and is to be managed in accordance with Nuu-chah-nulth principals and guided by the teachings of elders. To develop this initiative the **Tla-o-qui-aht** First Nations have partnered with the District of **Tofino** to pursue a ***Joint Sustainability Planning*** process and with **Parks Canada** on a ***Tribal Parks Establishment Project***. As well, a **Tribal Parks Society** has been incorporated and a ***Guardian Program*** has been launched.

A watershed plan is being developed, which will permit small run-of-the river hydro stations like a 5.5 megawatt installation by Canoe Creek Hydro that is 75% owned by the **Tla-o-qui-aht** First Nation. The 26 km (or 52 km return) Clayoquot Witness Trail, built in 1993-1995 to span the upper reaches of both rivers, is being cleaned up and repaired. Possibilities for adventure eco-tourism, including river & sea kayaking and forest canopy "zip lines", are being explored. Several logging tenures will have to be acquired. Forestry itself will involve cutting single trees only with subsequent processing of value-added items in carpentry shops or artisan spaces. Brand name products are to be developed, such as salal for florists, or berries, jams, mushrooms, and smoked fish for consumers. The Tla-o-qhi-aht First Nation had declared Meares Island to be a Tribal Park in 1984. Combined with the *Ha'uukmin* watershed, the total area constitutes about 60% of their traditional lands over and above smaller areas secured to them under the Treaty.

The **Tla-o-qui-aht** First Nation is considering whether the protection zone (*qwa siin hap,* for 'leave as it is for now') could be designated as a Conservancy under the terms of the Protected Areas of British Columbia Act. This provincial designation explicitly recognizes the importance of First Nations' social, ceremonial and cultural values, and allows for a wider range of low impact resource uses than would be allowed in a Class A park.

Important bird areas

The **Tofino Mud Flats Wildlife Management Area** has been designated as an "Important Bird Area" (IBA) using criteria established worldwide by **BirdLife** (*sic*) **International**. The site could also qualify as a designated Western Hemisphere Shorebird Reserve given its widely recognized significance as a major migratory stopover feeding area for shorebirds, especially western sandpipers (*Calidris mauri*). Four other IBAs have been identified in the biosphere reserve, including the Cleland Island Ecological Reserve because of its colonies of seabirds, and Strathcona Park with its conservation program for white-tailed ptarmigan (*Lagopus leucurus*).

Other initiatives

A ***Baja California-to-Bering Sea (B2B***) initiative to conserve migratory marine animals, notably gray whales (*Eschrichtius robustus*), has been promoted by a number of organizations including the **Canadian Parks and Wilderness Society (BC chapter).** In 2004, the **CBT** and **Parks Canada** participated in the first scientific working group meetings in San Francisco for the ***Commission for Environmental Cooperation*** (based in Montreal) where delegates from Canada, the US and Mexico crafted the initial document for consideration regarding the B2B project. In 2005, in cooperation with the **Marine Conservation Biology Institute** (Bellevue WA), the Commission mapped 28 critical conservation areas along this entire western coast of North America. One is Barkley Sound, located immediately south of the official biosphere reserve boundary. Some gray whales usually summer in the Clayoquot Sound region and provide opportunities for whale-watching tourism.

Additional biotic inventory work has been undertaken over the past decade. This includes: the identification of some 551 taxa of macrofungi in Clayoquot Sound; the documentation of diversity patterns exemplified by arthropods (from many Families and Genera) in the canopy and ground litter of old growth forests in five watersheds of Clayoquot Sound; and, the compilation of species-at-risk found in the area (i.e., from the COSEWIC federal government list and/or the provincial "red list" of endangered or threatened taxa, and "blue list of vulnerable or otherwise sensitive taxa). Population and/or monitoring surveys have been undertaken for selected species of marine mammals (gray whales, humpback

whales (*Megaptera novaeangliae*), orcas/killer whales (*Orcinus orca*), and sea otters (*Enhydra lutris*), as well as for marine birds such as marbled murrelets (*Brachyramphus marmoratus)*, double-crested and pelagic cormorants (*Phalacrocorax auritis* and *P. pelagicus*), and terrestrial mammals including ungulates, cougars (*Puma concolor)*, and the Vancouver Island Wolf (*Canis lupus crassodor*).

Recovery plans for species-at-risk that are present in the Clayoquot Sound region include: plans for Marbled Murrelet, 1994 (being up-dated and revised); Sea Otter, 2004; Northern Goshawk (*Accipiter gentilis laingi*), 2008; and, Offshore Killer Whales, 2009. **Uu-a-thluk** and the **Aboriginal Fund for Species-at-Risk** are gathering information about the occurrence of all species-at-risk in the Clayoquot Sound region. **Pacific Rim National Park Reserve** has 42 COSEWIC assessed species-at-risk, although not all of them occur regularly nor do all of them occur in the Long Beach Unit of the Park within the biosphere reserve. The Park also has the lead role in recovery plans for four species: goshawks, the Dromedary Jumping-Slug (*Hemphillia dromedarius*), the Pink Sand-Verbena (*Abronia umbellata*), and the Seaside Centipede Lichen (*Heterodermia sitchensis*).

The **Friends of Clayoquot Sound** maintains a watchdog and communications role over resource-based economic activities (logging, fish farming and mining) and threats to the rainforests and oceans. They maintain an informative website with news releases, maps and reports, and produce regular newsletters and information packages. The **Friends** have, and would, mount strong advocacy campaigns along with organizations such as the **Greenpeace** and the **Sierra Club** when deemed necessary. They support measures to create a conservation-based society and economies in the region; for example, they proposed the ***Clayoquot Green Economic Opportunities Project: Taking Steps Towards A Conservation Economy*** (2003) and partnered with **Ecotrust Canada** and Simon Fraser University's **Community Economic Development Centre** to conduct the research with the **Ahousaht** First Nation and funding by the **CBT**. The **Friends** most recently helped to organize an information session and campaigns about the possible implications of a proposed open-pit copper mining development.

3c. Linking conservation and sustainable development

Conservation links to, or integration with, sustainable development issues (e.g., stewardship for conservation on private lands used for other purposes).

The cultures, economies, spiritual values, and overall community well-being of the region is predicated upon the health and diversity of the biodiversity and ecosystems in both terrestrial and marine components of the biosphere reserve and its surrounding region. Parks and protected areas help to maintain the attractiveness of the landscape and seascape features of the region upon which much of the tourism industry is based.

3d. Other comments/observations from a biosphere reserve perspective

The concept of ***Tribal Parks*** as pursued by the **Tla-o-qui-aht** First Nation is a significant development, especially if other First Nations in the biosphere reserve region or beyond adopt the idea. It means that two quite different and deeply embedded cultural perceptions and uses of landscapes are being officially projected onto the same region. Local issues of interpretations about uses of certain sites and resources are expected.

Involvement by the Clayoquot Biosphere Trust

The **CBT** has not been involved directly in matters of establishing or managing parks and protected areas that constitute the "core areas" of the biosphere reserve. It has supported projects in the buffer zone, especially in the **Tofino** Mudflats where the former Executive Director (2002-2007) served as a member of the **Tofino Mudflats Special Management Area** from 2003-2007. It has also supported ecological field surveys and monitoring by organizations and agencies, some of which take place in protected areas (noted in Section 5). Since 2004, the **CBT** has been significantly involved in the prey-predator study led by Pacific Rim National Park Reserve, both as a funder and a participant, which involves ongoing research on interactions between cougars and humans.

SECTION 4. The Sustainable Development Function

(This refers to programs that address sustainability issues at the individual livelihood and community levels, including economic trends in different sectors that drive the need to innovate and/or adapt, the main adaptive strategies being implemented within the biosphere reserve, and initiatives to develop certain sectors such as tourism to compensate for losses in other markets, employment, and community well-being over the past ten years or so).

4a. Economic and resource use trends

Briefly describe the prevailing trends over the past decade in each main sector of the economic base of the biosphere reserve (e.g., agriculture, renewable resources, non-renewable resources, manufacturing and construction, tourism and other service industries etc.)

Resource Stewardship: Watersheds and Forests

Work has been, and continues to be, underway to implement the recommendations of the ***"Scientific Panel for Sustainable Forest Practices in Clayoquot Sound",*** adopted by the provincial government in 1995. The recommendations called for the use of an ecosystem-based management framework to be applied at both watershed and site levels within 14 watersheds. This was to assure protection for watershed integrity, biological diversity and other human values associated with, for example, cultural sites or recreational and scenic sites. The recommendations called for forest "harvesting" to be selective and carried out within areas not protected for these other values.

The ***Science Panel's*** approach to planning pre-supposes a great deal of basic land and resource inventories and other site/watershed-scale field studies. This work has been, and continues to be, carried out by what is now (after several administrative re-organizations in the provincial government), the **Integrated Land Management Bureau of the Ministry of Agriculture and Lands**. The plans had to be approved by the Clayoquot Sound **Central Region Board**, and then by the **Ministry of Forests and Range** (see Section 6 below). As of the time of this periodic review, 11 plans had been completed and approved, three of them in 2003 and the next eight by 2006. In May 2008, the ***Land Use Objectives for the Clayoquot Sound Planning Area*** (incorporating the specifications noted above) were approved by the current provincial government by Ministerial Order (Schedule 1, under Section 93.4 (1) of the Land Act (RSBC, c 245)).

Forestry

The forest industry had to adapt as best it could in anticipation of these planning requirements coming into force. It did so under the old forest tenure system (still in use for the rest of the province) in which area-based Tree Farm Licenses (TFL), issued for 25 years and renewable indefinitely, authorize volume-based (m^3/year) annual allowable (i.e., ~ required) cuts. Much of the Clayoquot Sound Planning Area is included in all or part of two TFLs (#54 and #57). Over the past 10 years or so, these have been transferred from the forest corporations who owned them to two local companies owned or controlled by **Ma-Mook Natural Resources Ltd**., a holding company that itself is owned by the five Central Region First Nations.

One local company, **Iisaak Forest Resources Ltd**., was originally (in 1998) 51% owned by **Ma-Mook** and 49% by **MacMillan Bloedel**. It has TFL #57 as its operating area. **Weyerhaeuser** bought out **MacMillan Bloedel** in 1999. In 2005, **Weyerhaeuser** sold its coastal logging operations to **Brascan**, and its 49% stake in **Iisaak** to **Ma-Mook**. **Iisaak** adopted the "quadruple bottom line" (economic, environmental, social, and cultural) for assessing its operations, and it also received **Forest Stewardship Council** (**FSC**) recognition in 2001. **Iisaak** had been removing about 45,500 m^3 per year from 2000-2007, considerably less than the amount set by the TFL it acquired. Under the old rules, this practice could result in unused allocations of allowable annual cuts to be re-assigned to others. From late 2006 to mid-2008, **Iisaak** hired **Ecotrust Canada** and **Triumph Timber** to review and improve its management to make it profitable. Although volume-based annual allowable cuts for **Ma-mook Natural Resources** were subsequently replaced by area-based allocations (ha/year), aspirations for conservation-based forestry were being hampered by limited access to milling and other valued-added processes for logs it was selling.

International Forest Products (Interfor) acquired TFL #54 in 1992. For the 10-year period 2002-2012, ***Interfor Management Plan 4*** reflected the move away from volume cuts on the areas covered by the TFLs to an area-based cut in watershed units. The Plan envisaged considerable reduction in "harvests" to accommodate the variable retention and selective harvesting of mature trees within watersheds. **Interfor** also had pilot projects underway to engage more people from First Nations communities in forest work.

Nevertheless, the **Tla-o-qui-aht** First Nation expressed dissatisfaction to the point that it symbolically "evicted" **Interfor** from its traditional territory in 2003.

In March 2007, **Interfor** sold its TFL #54 to **Ma-Mook**. It had decided that the relatively small isolated tenure was not part of its core business in western North America and that any logs from it could be readily bought at market prices. It continues to hold a TFL in **Hesquiaht** territory that includes parts of the un-logged valleys of old growth rain forest, but currently has no plans to log these sites. **Ma-Mook** then entered into a joint venture with **Coulson Forest Products** (based in Port Alberni) in part to pay for TFL #54. **Coulson** has milling and other manufacturing capacities through its subsidiary companies, and the joint venture included an agreement to maintain **FSC** standards, including chain-of-custody, requirements for their entire operation. Through **Ma-Mook**, **Iisaak** could access these value-added services as well. The ***Iisaak Forest Stewardship Plan, 2009*** conforms to the official (2008) land use objectives for Clayoquot Sound. In 2010, **Iisaak** purchased **Coulson's** share of the joint venture as originally agreed in 2007.

Model forest/forest community programs

The **Long Beach Model Forest** (1995) was one of 14 model forests across Canada that were funded in three phases between 1992-2007 by the **Canadian Forestry Service** (in **Natural Resources Canada**). Its area overlapped much of the biosphere reserve area and also extended south to Barkley Sound. It was effectively closed in 2002 after federal funding was eliminated following an evaluation from auditors for Natural Resources Canada. The main problems were at the Board level. The field studies that had been sponsored were first compiled and catalogued by the **Long Beach Model Forest** and then up-dated by the **CBT** and **University of Victoria's** ***Clayoquot Alliance for Research, Education and Training (CLARET*** - 2001-2004).

In 2008, the model forest program was modified administratively to become a ***Forest Communities Program (FCP)*** with similar goals. However, the focus is now placed on forest-dependent communities and opportunities for a more diversified local economy, and it is not necessary to have forest industry partnerships. Some model forests carried on under the new arrangements.

Among new initiatives funded by the ***FCP*** was a five-year, $1.5 million program launched in 2008 by **Ecotrust Canada** and the Nuu-chah-nulth **Central Region Management Board**. The main themes planned for the ***Clayoquot Forest Communities Program (CFCP)*** are: to develop "forest gardens" with an initial focus on the ***Hesquiaht Food Project*** in cooperation with the **CBT's *Healthy Foods, Healthy Communities*** program and other groups; to develop a range of value-added wood products, especially for housing, as an integral part of local forestry with an initial focus on **Ahousaht** territories; to design an ecosystem-based forest monitoring system that might incorporate a review of the ***Science Panel*** recommendations (1995); to develop a draft comprehensive land tenure system for TFL #54 that incorporates ecosystem goods and services valuations (as a model); to create a ***"Nuu-chah-nulth Living Atlas"*** that includes climate change projections that can serve the ***Nuu-chah-nulth Language and Culture Communications Program;*** to develop a feasibility study and/or business plan with other organizations for cultural tourism opportunities to boost local economies; and, to establish a strong organizational structure including protocols (e.g., with the *Council of Hawiih*) to further develop these initiatives at the conclusion of the ***CFCP***.

Proposed Barkley Community Forest

The British Columbia **Ministry of Forests and Range** supports the creation of locally managed community forests on Crown lands under the terms of the Forest Act (RSBC 1996, c 157, section 7.1). The stated intent is to provide opportunities to fulfill local use of Crown forests for a range of community objectives, values and priorities consistent with a commitment to culturally, ecologically and economically sustainable forest management. It is also meant to encourage closer cooperation with First Nations. Applicants must file a forest management plan, a business plan and evidence of strong community support for a community forest. They then may be approved for a probationary period of five years after which the agreement may be granted for 25 years and renewable every 10 years.

The **Toquaht** First Nation and District of **Ucluelet**, through its Economic Development Corporation, are applying to create a ***Barkley Community Forest*** on 6,790 ha of Crown lands somewhat adjacent to TFL #54 (now managed by **Ma-Mook**) in an area extending between **Ucluelet** and Toquart Bay on Barkley Sound, accessible by the Maggie Lake forestry road from Highway 4. This is within the area proposed for an extended transition

zone for the biosphere reserve. The area includes some cutover sites and also private forestland owned by **Island Timberlands**. The community forest vision statements are consistent with provincial requirements and they are explicitly related to the biosphere reserve's vision and principles. This initiative has been endorsed in Section 5.8.2c of the **Alberni-Clayoquot** Regional District's South Long Beach (Area C) ***Official Community Plan*** (Bylaw P1160, 2007). In 2008, the proponents were invited to apply for a probationary agreement by the **Ministry of Forests and Range**. They are in the process of creating a **Barkley Community Forest Corporation.**

Resource Stewardship: Fisheries, coastal and marine conservation

West Coast Aquatic (WCA), the new name (as of June 2009) for the **West Coast Vancouver Island Aquatic Management Board**, was originally created in 2001. The formation followed from a number of meetings and consultations beginning in the mid-1990s about the need for stakeholder participation in fisheries and marine issues under the umbrella of Treaty negotiations. It was also to serve the needs of the Canada Oceans Act (1997), the Canada-British Columbia Agreement on the Management of Pacific Salmon Fishery Issues (1997), the ***Nuu-chah-nulth Regional Aquatic Management Society***, and other initiatives in support of a co-management approach to coastal and marine issues. The region covered by the Board extended from Sheringham Point near Port Renfrew in the south, north some 300 km to the Brooks Peninsula north of Kyuquot, and inland via watersheds to the height of land in the coastal mountains (e.g., Sutton Pass, 250 m). It included about 20 settlements, a number of them quite small and remote.

The **WCA** Board has 16 appointed members (with alternates), with eight from the federal, provincial, First Nations and local governments, and eight drawn from various non-governmental organizations who serve in their own capacity (not as formal representatives of other organizations) and with a commitment to the purposes of the Board. **WCA** is an advisory forum for management agencies and has no legal powers itself. It meets about four times a year for two days each, and sets up small joint working groups to delve into particular issues when needed. It also arranges special dialogue sessions from time-to-time with the **Department of Fisheries and Oceans** to get briefed and to discuss major topics concerning the Pacific Ocean, Canada's commitments under international agreements, and scientific work in marine biology.

The **WCA** Board discusses a range of subjects based on reports or other issues brought to their attention, and they have to sort their priorities depending upon what they judge they can contribute to particular items. Examples of items that were discussed during 2009 include (in no particular order): the halibut allocation process and the groundfish dialogue; implementation of the Pacific Salmon Treaty; climate change and ocean acidification; the draft management plan for the Pacific Rim National Park Reserve; wild salmon policy implementation measures; and, participation in deliberations of the Clam Board that oversees openings/closings of seasons for different shellfish beds at different locations along the coast.

The **WCA** Board has three or four staff at any given time. It maintains a digital library of reports, research papers and other documents relating to ecosystems, communities and activities, and an interactive regional map atlas with over 100 Geographic Information Systems (GIS) map layers of information. On their website, they provide information about events, opportunities or other matters that might be of interest to their clientele.

In 2005, 15 Nuu-chah-nulth First Nations created an organization, "**Uu-a-thluk",** as a forum for to work together and with the federal and provincial governments on matters of a collective bi-lateral nature. It shares a secretariat with the Board to ensure coordination and service delivery.

In 2008, the **WCA** Board received a $1 million grant from the **Moore Foundation** to facilitate the development of a region-wide marine plan and specific coastal plans for Barkley Sound and Clayoquot Sound. A **Tsawalk Partnership** was launched in 2009 to develop a collaborative approach to this work. It was envisaged that for Clayoquot, the coastal plan would complement the watershed and forest plans approved by the **Central Region Board**. In January 2010, the ***Na-a-qu-us Project***, funded by a Community Adjustment Fund (Western Economic Diversification) employed 14 people from First Nations communities to help organize community involvement in the planning process. The partnership initiative includes ecological and socio-economic reports, studies of economic opportunities, visioning and values surveys, and working with **Ecotrust Canada** on a potential ***Marine Investment Analysis*** tool. The **CBT** has been involved in recent discussions with a view to some partnership possibilities.

The original **WCA** Board was set up as a three-year pilot project. An external evaluation in 2005 concluded that the project led to a unique and significant effort at building a collaborative planning process. It had progressed from skepticism through dialogue to active collaboration on many topics of shared interest, and diversified its funding support. Thus, it is being continued with about half of its operating funds coming from the **Department of Fisheries and Oceans** and the rest from other sources. Its five-year business plan for 2007-2012 focused on a number of specific issues to deal with under the general headings of prosperity, science/technology, sustainable use; healthy oceans, and governance. Although a Nuu-chah-nulth fisheries litigation in the British Columbia Supreme Court went on from April 2006 to November 2009 (see Section 6), continued cooperation on these other fisheries and marine matters did not seem to be hindered.

Resource Stewardship: Aquaculture

Aquaculture began in coastal British Columbia in the 1980s with a number of local, small-scale operations. These local operations faced economic difficulties when fish prices were low and were subsequently bought by larger companies, most linked with major food producers. In 2000, **CERMAQ**, a Norwegian-based company that was 43.5% owned by the Norwegian government, embarked on acquisitions to become a world leader in farmed salmonids (salmon and trout). It acquired **EWOS**, a major producer of fish feed that also has extensive aquaculture research and development facilities, to find new and more efficient diets for use in all of the main salmonid farming regions of the world (i.e., Norway, Scotland, Chile and Canada (British Columbia)). At the same time (2000), **CERMAQ** bought the three small groups of fish farms in the Clayoquot Sound region and created **Mainstream Canada** as a wholly-owned division of **EWOS Ltd**.

Mainstream is a vertically integrated company that controls its own hatcheries, grow-out fish farms, processing plants for fish products, and marketing and distribution system. Under a 2002 protocol agreement signed by former fish farm owners with the **Ahousaht** First Nation, **Mainstream** operates 22 open water pens in Clayoquot Sound; 14 are active at any given time, with each containing up to 500,000 Atlantic Salmon (*Salmo salar*). It has a hatchery to produce young smolts in Port Alberni, a **EWOS** fish feed plant in Surrey B.C. (in the Greater Vancouver Regional District, or Metro Vancouver), and a primary processing plant in **Tofino**. It employs about 140 full-time equivalent staff. In 2007,

licenses for nine sites were renewed for another 20 years, even though some were located within a rockfish conservation area. In January 2010, the **Ahousaht** First Nation and **Mainstream** signed a renewed five-year protocol agreement that acknowledged **Ahousaht** rights and title within the Clayoquot Sound region, and commits the signatories to work together to provide employment and related business opportunities for the people of **Ahousaht** and to fund a wild salmon enhancement project.

The **Creative Salmon Company, Ltd**. is a smaller operation that has six fish farms in the **Tofino** Inlet area that raise Chinook salmon (*Oncorynchus tshawytscha*), a native species in British Columbia. It is one of the founding members of the Pacific Organic Seafood Association (POSA) and operates with a philosophy that their environment, employees and local community are equally as important as the economic bottom line. **Creative Salmon** has a Sea Spring hatchery on the east coast of Vancouver Island to produce smolts that are then transferred to the Clayoquot Sound fish farms, a primary processing plant, **Lions Gate Fisheries Ltd**, in **Tofino**, and a final processing and packaging plant in Delta B.C. (in Metro Vancouver). It employs about 45 staff. It operates in Clayoquot Sound under a protocol agreement with the **Tla-o-qui-aht** First Nation.

Over the years, like most fish farms, these operations encountered problems with toxic algae blooms fed by fish wastes from the pens, episodes of virus outbreaks (e.g., Infectious Hematopoietic Necrosis – IHN), outbreaks of sea lice, and occasional mass escapes of the farmed salmon. Predator nets surrounding the pens have drowned sea lions trying to access the fish (46 in 2006 and 110 in 2007) and other marine mammals have been deliberately killed around the farms. There is continuing concern about what impacts all of these factors are having on the native wild Pacific salmon (*Oncorynchus spp*.) and on the marine ecosystems.

Both the federal and provincial governments support the expansion of the aquaculture industry. The main regulatory oversight was deemed to be under provincial jurisdiction (as “farms”), but a February 2009 British Columbia Supreme Court decision declared them to be a “fishery” and thus under federal jurisdiction. The **Department of Fisheries and Oceans** was ordered to assume this responsibility by early 2010. The decision is being appealed by the provincial government and by the largest commercial fish farm corporation in B.C.

Critics of fish farming, or at least of how it has been practiced so far, note the record of poor compliance with provincial regulations over the years, and have increasingly advocated that the companies be required to use either floating closed tanks or land-based systems that include waste treatment before discharging waste water. In 2009, **Sustainable Development Technology Canada** awarded $2.4m to the **Middle Bay Sustainable Aquaculture Institute**, Campbell River B.C. (on the east coast of Vancouver Island), to develop and demonstrate a commercial-scale solid-well containment system, incorporating waste recovery, for aquaculture.

Resource Management: Minerals, Oil and Gas

There is a large, low-grade copper-molybdenum deposit on Catface Mountain in the traditional territory of the **Ahousaht** First Nation, located about three kilometres from the main village of **Ahousaht**. The deposit has been known of for decades, but there is episodic interest in exploring its potential for development into an open-pit mining operation should newer technology and/or changing economic conditions warrant it. Exploratory work had been approved by **Ahousaht** under a memorandum of understanding. The **Ministry of Energy, Mines and Petroleum Resources** authorized another round of exploration in 2008-2009. It involved drilling for eight core samples near the top of the mountain in 2008 and for another 22 in 2009 and 2010. Most of these were at the top of the mountain but six were lower down on the south slope. The samples showed a copper content ranging from 0.16 to 0.45%.

Exploration drilling was undertaken by **Selkirk Metals**, viewed as a relatively junior company in the industry. In 2009, **Selkirk** merged with **Imperial Metals** (Vancouver) that has two open pit copper mines in B.C. and five other mineral exploration properties in the province. This has renewed concerns about what an open pit mine could entail on Catface Mountain. The main scenario anticipates removal of about 40% of material from the 880 metre south peak face, the disposal of huge volumes of waste rock (e.g., in nearby valleys), heavy metal toxic wastes, some of which will leach into salmon streams and/or from overflowing tailing ponds (especially given the high annual rainfalls), and a potential deepwater port with possibly an ore-processing plant as well. All of this is within a short distance from **Tofino,** some 13 km away across the water. The **Friends of Clayoquot Sound** and other groups are campaigning against this development, and

District of **Tofino** Councillors and Ahousaht First Nation leaders are being called upon locally to explain why mining explorations have been allowed in a biosphere reserve.

A federal moratorium on off-shore oil and gas development along the entire British Columbia coast has been in effect since 1972. There is a long-standing industry interest in removing it. The B.C. government expressed favour of removing the moratorium in 2004, with the idea that offshore production might be up and running by 2010. The primary area of interest is north of Vancouver Island in the Queen Charlotte Basin of Haida Gwaii, but First Nations groups there are opposed. The Tofino Basin immediately offshore of the biosphere reserve area is also thought to have considerable potential for natural gas (but not oil). Technologies now used for extracting natural gas from inland shale deposits elsewhere affect the business economics of offshore alternatives. Aboriginal rights and title issues would also have to be resolved. The ***Oil Free Coast Alliance*** of about 110 environmental, business, Aboriginal, fisheries, and other groups support maintaining the moratorium in British Columbia, and would likely become active again should the situation change.

The **CBT** has not been involved with these two issues.

Agriculture and local food systems

In recent years, residents have become more active in forming groups and developing projects to address food systems and local food security issues, which include the need for the affordable, accessible and equitable distribution of quality, nutritious foods, especially to remote First Nation communities such as **Hot Springs Cove**. These issues have evolved in the context of the collapse of the regional fisheries and forestry activities that not only affected local economies, but also local food choices. The **CBT** has played an important role in supporting work on these issues by partnering with the **Ucluelet Community Food Initiative** in conducting a regional survey, and with **Ecotrust Canada** and the **Hesquiaht** First Nation on an ***Hesquiaht Food Planning to Action Project.***

The only example of productive agriculture in the region is that of the ***Rainforest Farm Project*** (known locally as ***The Medicine Farm***)***,*** which has developed off-grid organic farming practices over the past nine years on a small plot of land in the **Ucluelet** area.

The farm supplies some local restaurants and sells to those who drop by. Adopting an 'horticultural therapy approach', the farmer teaches 'WWOOFers' (volunteers who participate in the ***World Wide Opportunities on Organic Farm*** initiative) and recovering addicts how to grow food. Small-scale aquaculture adjacent to the farm is currently being developed to increase productivity.

4b. Community economic development

Community economic development initiatives. Programs to promote comprehensive strategies for economic innovation, change, and adaptation, and the extent to which they are being implemented within the biosphere reserve. Local business or other economic development initiatives. Are there specific "green" alternatives being undertaken to address sustainability issues? Relationships (if any) among these different activities.

The general situation

There is no over-all planning for orderly, sustainable development for the Clayoquot Sound Biosphere Reserve region. In the natural resources sector, as noted in Section 3 (above), the Clayoquot Sound **Central Region Board** had authority to review and recommend approvals of watershed and greatly revised forest management plans to make sure they conformed to the recommendations of the 1995 ***Science Panel***. The Board also reviewed other resource use and development proposals except those for marine fisheries. However, final approval authority remained with the provincial government. The new coastal planning initiative being overseen by **West Coast Aquatic** could complement this approach. In 2006, the province launched the ***Island Coastal Economic Trust*** with a $50 million development initiative fund to help diversify nine sectors of Vancouver Island's economy. The **Alberni-Clayoquot** region (including the entire biosphere reserve) is included in the "North Island-Sunshine Coast Region".

The tourism sector has grown considerably over the past decade. It is driven entirely by market opportunities and responses to them by business at all levels from multinational corporations to local entrepreneurs. Clayoquot Sound is promoted as a year-round tourism and outdoor recreation opportunity because of its spectacular scenery, unique Aboriginal culture, and the perception of it as both remote and accessible. "Adventure"

activities include sea kayaking, diving, surfing, backcountry hiking, and mountain biking. Nature-based activities include fishing, wildlife viewing, camping, and winter storm-watching. A variety of small-craft ecotourism operations feature gray whales, sea lion 'rookeries', bald eagles, black bears (sometimes), hot springs, and visits to First Nations villages. **Tofino** is both a destination area and a gateway point for much of this. The Village of **Tofino** has a full-range of visitor accommodation, facilities and services. A few accommodations, such as local bed & breakfast businesses, are adopting green practices. **Ucluelet** has also been developing this role for areas in the Barkley Sound immediately south of the biosphere reserve and in the area of the new ***Tribal Park***. The **Pacific Rim National Park Reserve** provides an easily accessible range of interpretive services, guided walks in ancient rain forests, and ready access to beaches upon payment of a range of entry and service fees.

The number of visitors to the Clayoquot Sound region in the mid-2000 years had been estimated to range between 750,000 to 1.3 million annually. Surveys at the **Tofino Visitor Centre** indicate that about half were from British Columbia (27%) or elsewhere in Canada, 25% from Europe, and the rest mainly from the US, Australia and Asia. Over 20,000 visitors have been reported in **Tofino** during peak weekends in summer. **Pacific Rim National Park (Long Beach Unit)** had an estimated 795,608 visitors between April 1, 2004, and March 31, 2005 (a peak year) and 775,158 in 2007-2008; the Park continues to attract about the same number of visitors each year to its Long Beach Unit in the biosphere reserve. It is now estimated that about one million visitors visit the Districts of **Tofino** and **Ucluelet** each year.

There has been no overall planning at local or regional levels to foster tourism development in an orderly, environmentally-sensitive way. Infrastructure has developed in a rather haphazard manner and is insufficient for peak demands. Other issues identified in tourism studies include: escalating local real estate and housing costs; many instances of poor site planning and design, especially along foreshore areas that need protection of values that attract tourism; needs for upgrading public road and water transportation services; needs for tourism and hospitality training for management and service staff; a lack of sufficient accommodation for service staff; and, sensitive use of the restricted access to major parks and protected areas.

First Nations communities have not benefited as much from the booming tourism industry on the West Coast as non-First Nation residents, but are increasingly playing a role in informing and developing tourist operations. On-going Treaty issues and questions about encroachments on Nuu-chah-nulth cultural values and traditional terrestrial and marine territories have played a part in complicating matters. Encouraging examples of aboriginal-owned businesses flourishing in the tourism sector include arts and crafts shops, some eco-tourism excursions (including trips in traditional dug-out canoes provided by **Tla-ook Cultural Adventures**), plans for the ***Tla-o-qui-aht Tribal Parks Initiative,*** and food services. The **Tin Wis Best Western** resort and conference centre near **Tofino**, owned and operated by the **Tla-o-quit-aht** First Nation, has received a number of awards for its accomplishments. In 2009, in cooperation with the province, **Tofino**, and ARG Services Inc. (Courtenay B.C.), **Ahousaht** First Nation announced a major **Kakawis Wilderness Resort Village** to be built on the site of a former residential school on Meares Island, and a Cypre Valley Recreation and Conservation Reserve eco-resort development (near **Ahousaht**) designed to have "no-net negative environmental impacts" and to preserve natural and cultural heritage features. Parks Canada, in consultation with a Nuu-chah-nulth working group, developed the **Nuu-chah-nulth Trail** that celebrates and interprets Nuu-chah-nulth cultural heritage in the **Pacific Rim National Park Reserve.**

Some local municipal plans are (somewhat retroactively) addressing issues of affordable housing, job training for young adults, up-grading of infrastructure such as waste treatment and recycling/disposal facilities, and finding ways to encourage qualified persons from registered band members living in other parts of western Canada to return, in part to help with the implementation of Treaties. Tourism Boards were established in both the District of **Ucluelet** and District of **Tofino** in 2008, but neither District retains a full-time economic development position. **Ucluelet** adopted an award-winning sustainability and "smart growth" approach to its planning over the past five years or so.

4c. Community support facilities and services

Community support facilities and services. Programs in/for the biosphere reserve that address issues such as job preparation and skills training, health and social services, and social justice questions. Relations among them and with community economic development.

Two community futures corporations, funded by **Industry Canada** (through the Western Economic Diversification Program) have been established in the biosphere reserve region – the **Nuu-Chah-Nulth Economic Development Corporation**, 1984, and the **Community Futures Development Corporation of Alberni-Clayoquot**. Their main emphasis is advising on all aspects of new start-up businesses serving whatever markets appear feasible. The **Alberni-Clayoquot Economic Development Commission, Ucluelet Economic Development Corporation**, and **Tla-o-qui-aht Economic Development Corporation** seem to provide similar services, but also provide some financing for new enterprises. The **Centre for Community Enterprise**, 1988 (Port Alberni) promotes capacity building for disadvantaged populations and communities to engage in community economic development. It has worked with **Ma-Mook** and the Ucluelet First Nation.

Ma-Mook Development Corporation, 1997, owned by the five Central Region First Nations through the **Central Region Management Board**, now owns **Iisaak Forest Resources** and the former **Ma-mook-Coulson**. **Ma-Mook** sponsored a study in 1999 for a tourism development framework that applied to the five First Nations in the biosphere reserve. It also took a lead in obtaining federal funding for broadband Internet connections in the region. The new **Ucluth Development Corporation** acquired the Thornton Motel in **Ucluelet** that is now operated by the Ucluelet First Nation. It has also acquired land for an 800 hectare oceanfront destination resort in the Fletcher Beach area, including a 34 hectare parcel of land obtained from the Pacific Rim National Park Reserve (as part of the Ma-nulth Treaty agreement). Plans call for a LEEDS (Platinum standard) complex of cabins, tents, a major hotel and conference centre, a spa, and a restaurant & retail centre, all serviced by off-grid energy from wind, ocean wave, and geothermal power sources.

Significant needs in job preparation and skills and trades training continue to be identified and addressed by comprehensive government programs such as the **Port Alberni Service Canada** Centre for career planning and job-search assistance, with special summer services for youth as of 2008, and the **B.C. Ministries of Labour and Citizens' Services, Employment and Income Assistance**, and **Community Services**. Not-for-profit groups like the **North Island Employment Foundation Society** provide links to job training and available jobs. Community groups and institutions such as the **Wickanninish Community School** continue to offer adult and youth-at-risk education and training

programs despite recent threats of reduced funding. Other training opportunities are now provided in Port Alberni and **Ucluelet** by the **Alberni Valley Employment Centre** (formerly Westcoast), as well as by **North Island College,** which offers courses in **Ahousaht** and **Ucluelet**, degree programs in Port Alberni and elsewhere on Vancouver Island, and joint initiatives with **Vancouver Island University** and **Royal Roads University**. A **Skills Development Centre** in the Comox campus is in the planning stages and might draw people from the Clayoqout Sound region.

There is a need for a comprehensive and informative website that clearly outlines who can access what social and health services, and how. Primary and major health and medical services are provided by the **West Coast General Hospital** in Port Alberni, the **Tofino General Hospital**, and the **Ucluelet Medical Clinic**. The **Nuu-chah-nulth Tribal Council** offers a wide range of services to member communities, including programs for community health, nursing and infant development. This was especially needed following reductions in other pediatric services. Other services are offered by the provincial **Ministry of Children and Family Development, and Ministry of Community Services,** both of which emphasize strong community involvement.

The First Nation communities have lower incomes, poorer housing, younger populations, and higher levels of social problems, especially in the more outlying areas, than the other communities, which are generally experiencing economic growth. A community needs assessment in 2003 for First Nations in the biosphere reserve identified many areas for improvement, including: child care facilities and programs for children, pre-teens and youth; counseling for families and family-related problems; services for seniors; housing; local access to food and clothing; and, education and training at all levels. First Nations and civil society organizations continue to address many of these issues. Examples include the **Ahousaht Holistic Society,** The **Kackaamin (formerly Kakawis) Family Development Centre, The Clayoquot Sound Basic Needs Society**, the **Coastal Family Resources Coalition**, and the **Westcoast Community Resource Society**. In 2010, a ***Nuu-chah-nulth Social Issues Forum*** identified problems of alcohol & drugs, bullying, culture & language, education, restorative justice for first-time offenders, safety, and unemployment as ones that still need more attention.

Critically, a lack of affordable and accessible public transportation has a highly significant impact on what activities youth can participate in and on their safety and security. West Coast youth, especially from the indigenous communities, tend to hitchhike throughout the region. Without easily accessible transport for participating in healthy and skill-building extra-curricular activities, youth may turn to abusing drugs and alcohol. Thus, a regional transportation system that reaches remote communities is vital to the well-being of the region's youth.

4d. Other comments/observations on development from a biosphere reserve perspective

The Ecotrust Canada alternatives

In 2002, **Ecotrust Canada** partnered with the **Friends of Clayoqout Sound** (the initial proponents of the project) and the **Ahousaht** First Nation to complete the ***"Clayoquot Green Economic Opportunities: Taking Steps Towards A Conservation Economy"*** research project with the **Community Economic Development Centre** at **Simon Fraser University**. The **CBT** provided partial funding. A survey identified possible small-scale community-based economic development projects and issues to be faced in realizing those opportunities. The situation in 13 socio-economic sectors was reviewed, with special attention to particular opportunities that might be pursued in **Ahousaht**. Criteria for judging possibilities included ecological sustainability, social equity, economic wellbeing, and recognition of the inherent rights of First Nations. The opportunities identified in order of priority were: shellfish harvesting, arts and culture, value-added wood manufacturing, and "green products and services". Other longer-term possibilities included fisheries and other resource sectors, "green energy", and the enhancement of selected research and education capabilities. Barriers identified included policy issues and scale of investments needed; there was no clear government policy or direction for promoting small businesses in rural / resource locations such as the Clayoquot Sound region. Hence, they found overlapping efforts at different jurisdictional levels.

Ecotrust Canada partnered with **Shorebank Enterprises Pacific** (Washington State) to provide start-up investment funds for small-scale "green" businesses in the Pacific coast region, including some in the Clayoquot Sound area. Partly in response to the 2002 research results, **Ecotrust** has loaned money to several businesses in the area, including

Iisaak Forest Resources, the **Trilogy Fish Company** in **Tofino,** and to some shellfish growers in Clayoquot Sound to create locally branded quality shellfish products. In 2006, **Ecotrust Canada** established a wholly-owned subsidiary **Ecotrust Canada Capital** to administer these and newer loans to enterprises that meet their "triple bottom line" criteria. It offers micro-loans of up to $25,000 and business loans of up to $500,000, and regularly helps local people to prepare business plans for conservation economy initiatives and to access potential funding sources.

As noted under Section 4a, **Ecotrust** has a lead role in a new (2008) ***Clayoquot Forest Communities Program*** funded by the **Canadian Forest Service**. One of its first actions was to commission a social survey of people in 303 households in the five Central Region Nuu-chah-nulth communities, **Tofino** and **Ucluelet** to gather their views on 10 broad topics related to building a conservation economy. Interviews were carried out between mid-December 2008 and mid-March 2009, and respondents were able to complete written versions to submit on-line or on paper. Many of the 45 questions were to characterize the respondents in various ways, and the rest solicited their views on matters of interest in the Clayoquot-Pacific Rim region. Tallies were of the percent of respondents replying to pre-coded or open-ended questions.

There were several findings of interest for the periodic review. Residents were particularly attracted to the area for its scenery and outdoor recreation possibilities, and they ranked their community highly in terms of "over-all quality of life" (76%), their social life & friends (68%), and trust & cooperation (49%). However, they were very concerned about "overdevelopment" along with too many tourists (42%) and issues such as affordability and housing (32%). Personally, they were "very concerned" about affordable housing (72%), protecting the environment (71%), the cost of living (67%), alcohol & drug abuse (56%), local overpopulation/development (53%), and the gap between rich and poor (48%). They were also much less satisfied with jobs, skills training and economic opportunities, the quality of schools and health care services, and local governments. When asked about community organizations that they think are doing a particularly good job, respondents listed 30 individual or general categories of organizations. The top five were: **Friends of Clayoquot Sound** (an environmental advocacy organization, described in 3b), voted as such by 12% of the respondents; the **Food Bank** (it distributes donated groceries to the needy); parks & recreation facilities in **Tofino**; **Ecotrust Canada**; and the

CBT, as voted by 8% of respondents. Generally, the results were considered to reflect the growing imbalances, inequalities and vulnerabilities created as "externalities" by the market-driven tourism development strategies pursued over the last decade or so.

CBT involvement

From time to time, the **CBT** has funded feasibility studies for small-scale shellfish and biofuel enterprises (one from fish wastes) and for baseline studies or business plans of local business associations (e.g., **Tofino Business Association, Ucluelet Chamber of Commerce)** or community organizations (e.g., **Long Beach Recreation Centre**). The **CBT's** main contributions have been to the social and cultural sector organizations. Examples include (in alphabetical order): the **Ahousaht Cultural Centre Society; First Nations Youth Photography Club; Nuu-chah-nuth Central Region Language Group**; **Pacific Rim Arts Society; Pacific Rim Communities Senior's Care Society; Pacific Rim Hospice; Ucluelet Disaster Relief Society; Ucluelet Elementary School's** "Aboriginal Language and Culture room"; and the **Westcoast Family Resources Society**. Due to **CBT's** charitable status (regained in 2009), it does not engage in direct economic development activity or funding of commercial projects. It does remain engaged in a broad range of community health and "quality of life" initiatives that may have indirect economic benefits.

A ***Clayoquot Socioeconomic Report (2009***) was commissioned by **Ecotrust Canada** and administered by **CBT**. Consultants compiled social and economic data from a number of sources and compared findings from the Clayoquot Biosphere Reserve Region to the province of British Columbia and to some global trends. An assessment of the "community health" of the region was then made. The main conclusions drawn were that: the region had a "fragile regional economy" prior to the onset of the 2008 global downturn; the region's "mono-economy" is over-dependent on tourism and a transient seasonal part-time work force that does not bode well for the long term; the energies expended on declining extractive-based resource sectors have been at the expense of pursuing innovative and productive alternatives to diversify the economic benefits for communities and future generations; the elaborate and long-drawn out Treaty negotiations have consumed the time, attention and resources of First Nations in particular, some of which might otherwise have gone towards community development and the economic renewal of Nuu-chah-nulth communities; yet there does remain much untapped potential for

developing collaborative regional approaches to an alternative development where quality of life is the objective, knowledge, innovation and investment are the resources, and opportunities and benefits are widely shared among all communities in the region.

For this periodic review, the **CBT** distributed a survey in May 2010 to local people who had some association with **CBT** activities (e.g., by participating in the advisory committees). By mid-July 2010, 58 responses were received. As might be expected, the respondents were quite aware of the **CBT** and the biosphere reserve designation. Written comments on the survey and spontaneous feedback about the pre-coded questions suggested quite diverse expectations about what the designation means and thus what the **CBT** would (or should) do. As a result, what emerged were different opinions about the relative importance or significance of the **CBT's** work and about what priorities, partnerships and initiatives it could and should pursue. This exercise can be seen as a useful probe that could help guide **CBT's** communication and marketing strategy and activities. The ***Ha-shilth-sa*** Nuu-chah-nulth newspaper might be of particular help in publicizing how the projects being funded (especially major initiatives, such as those related to local foods and nutrition) relate to what a biosphere reserve is all about.

The results also point to the need for locally-relevant processes of citizen engagement concerning a range of topics, including: the meaning of the designation to residents in the region as compared to the UNESCO mandate and other sites in Canada and around the world; the related purpose, priorities and activities of the **CBT**; how individuals and organizations can partner with the **CBT** to carry out initiatives that are consistent with the UNESCO mandate and CBT's core priorities; how local projects can be connected to networks and initiatives beyond the region; and, local issues that have implications for the sustainability of the people, environment and resources of the region. Overall, the results and interviews revealed a desire for the **CBT** to lead discussions and long-term initiatives to address how to move the region toward self-sufficiency and sustainability.

SECTION 5. The Logistics Function

(This refers to programs that enhance the collective capacity of people and organizations in the biosphere reserve to address conservation and development issues. Much of it may be directed towards the research, monitoring, demonstration projects, education and training that are needed to deal with the specific circumstances of the biosphere reserve. To be effective they should be open to learning and the exchange of experience with other biosphere reserves and international programs of cooperation).

5a. Research: institutions, initiatives, studies, and monitoring

Describe the main research institutions in the biosphere reserve, or conducting work in the biosphere reserve, and their programs. Comment on organizational changes (if any) in these institutions over the past ten years as they relate to their work in the biosphere reserve. Summarize the main themes of research and monitoring undertaken over the past ten years under the general categories of trans-disciplinary syntheses (research and scholarship), and for topics that come under the standard abiotic, biotic, and socio-economic categories. List specific topics with reference citations under these headings, and provide a list of the full citations alphabetically by lead author at the end of S.5 or in a separate Appendix.

For reasons noted below, it seems best to combine discussion of 5a and b together. Appendix 3 is a list of publications that reflect the range and scope of research and scholarship associated with the Clayoquot Sound region. This material is very scattered among a large number of reports and scientific journals, so it is, at best, indicative of what has been done, but not an exhaustive compilation of it.

5b. Environmental / sustainability education

Environmental/sustainability education. Note the main educational institutions ("formal" – schools, colleges, universities, and "informal" – services for the general public) in the biosphere reserve, or conducting work in the biosphere reserve. Describe their programs, including special school or adult education programs, as these contribute towards the functions of a biosphere reserve. Comment on organizational changes (if any) in institutions and programs that were identified in the biosphere reserve ten or so years ago (e.g., closed down, redesigned, new initiatives). Note programs of the UNESCO Associated Schools where applicable, and contributions towards the UN Decade of Education for Sustainable Development (2005-2014).

The Clayoquot Sound Biosphere Reserve has no difficulty in attracting interest from researchers wanting to undertake studies due to its attractive location. A ***"Standard of Conduct for Research"*** (2003) was developed by the **Clayoquot Alliance for Research, Education, and Training (CLARET),** a partnership between the **CBT** and faculty at the **University of Victoria**. The **CBT** maintains two research cabins acquired from the former **Clayoquot Biosphere Project**, the Sydney Inlet Biosphere Research Cabin in **Ahousaht** Traditional Territory, and the Clayoquot Lake Biosphere Research Cabin in **Tla-o-qui-aht** Traditional Territory. The **CBT** also helps support research and other studies by other local organizations. One of three "core priorities" for the CBT and a long-term goal, is to establish a Biosphere Centre (2008), which could contain a multi-media library to house scientific, cultural, educational, historical, environmental, and other publications and information.

Organizations that undertake research, survey, monitoring, education, and training activities are listed below in alphabetical order. Two groups are identified - those based within the biosphere reserve, and those based elsewhere but who work in the biosphere reserve region. In some cases, the work was for a fixed time period only or it has only recently begun. The list below is intended to cover the past decade.

Within the Clayoquot Sound biosphere reserve

Association of Wetland Stewards for Clayoquot and Barkley Sounds: This local group conducts surveys of wetland biota, including a study of amphibians such as Red-legged Frogs and Northwestern Salamanders that serve as indicators of wetland ecosystem integrity, partially funded by the **CBT.**

Boat Basin Foundation: The Foundation has a Temperate Rainforest Field Study Centre based on 47 hectares of land at **Hesquiaht Harbour**, about 42 km north of **Tofino** (accessible only by boat or float plane in favourable weather). The Centre has six cabins and a central hall facility, and the site includes "Cougar Annie's Garden", of local historical interest. It is for use by university students for field studies or by other groups through prior arrangement.

The Clayoquot Alliance for Research, Education and Training (CLARET) was a SSHRC/CURA project (2001-2004) organized as a partnership between the **CBT** and the

University of Victoria. The project team developed several community-based projects, providing a forum to link community interests and needs with academia and to make academic training and education resources more accessible in the region.

Widely consulting with communities and academics, **CLARET** developed a formal ***"Standard of Conduct for Research in Northern Barkley and Clayoquot Sound Communities"*** (June 2003) to guide research institutions/personnel coming to the region. **CLARET** also explored the idea of having a local centre in Clayoquot Sound to serve as a permanent reference centre, clearinghouse and facility for maintaining databases. They created a meta-database with links to government documents about Clayoquot Sound (since 1984) and various data resources in the region. The meta-database drew upon the work of the former **Long Beach Model Forest** (to 2002), with additional material from an inventory of university-based research in the region.

The project co-sponsored workshops and symposia (2001-2003), and consulted widely on community concerns that local initiatives and academic research could address. Their 2003 Clayoquot Symposium, entitled, ***Citizen Science and Community Health: Health Across The Water,*** was particularly successful at bringing people from different communities in the region together with academics in a forum to discuss issues of local concern, and at showcasing the diverse, high quality work carried out by local organizations and individuals. Before the symposium, meetings in **Tofino**, **Ucluelet**, **Maaqtusiis** (**Ahousaht**) and **Hot Springs Cove** (**Hesquiaht**) were held to discuss a range of topics, including the status and trends of community health in the region, the effects of tourism on local economies, the environment and social health, and coastal zone planning. Culture, cohesiveness, sense of place, and security, equity within and among communities, opportunities for recreation and gaining an education, and affordable and suitable housing were some of the issues covered. During the symposium, discussions centered around the following themes: the value of First Nations' traditions and culture; working with youth; environmental health as an integral, threatened component of community health; economic diversification and equity among communities; the importance of community events; self-reliance and self-empowerment; community access to resources and places; and, clarifying decision-making processes. Symposium participants expressed a desire for more symposia to be held, and for the **CBT** to play a vital role "in building trust, spearheading discussions, promoting environmental and social

values, transcending political boundaries, engaging youth, raising awareness, and providing support to communities to pursue local projects" (CLARET 2003: 5). The pre- and post-symposium summaries are well worth a read as recommendations emerged for moving forward toward a more unified, viable and healthy region (http://www.clayoquotalliance.uvic.ca/Symposium2003/index.html).

Further, **CLARET** obtained funding from **Industry Canada** to explore the feasibility of delivering high speed broad internet services to the West Coast (***Clayoquot Sound – Mamook Broadband Access Project)***. Two other significant projects were the ***Iisaak Sustainability Project*** and the ***Nuu-chah-nulth Central Region Language Project*****.** The former included a report with recommendations for monitoring and capacity-building, while the latter produced an interactive DVD and a book. A main theme of their publications was "Sound Governance," with insightful discussions of issues and changes underway in the region. In addition, **CLARET** held a number of interviews, meetings and community events to develop a useful list of community research needs related to aquaculture, community health, marine resources, and tourism. The ***Clayoquot Sound Regional Web Atlas*** project and a partnership with the **Raincoast Education Society** to deliver the ***Raincoast Host Program*** (aimed at tourism staff), and the ***Raincoast Energy Program Series*** are other key achievements. As of the time of this periodic review, the work of CLARET was still available on line at: http://www.clayoquotalliance.uvic.ca/).

Clayoquot Field Station / Tofino Botanical Garden Foundation: The field station in the gardens is a 32 bed dormitory and teaching facility that includes a large classroom, seminar rooms, a library, and a wet lab. It hosts programs, classes and events for "transformative experiential learning" on a wide range of topics. The gardens are on a five hectare site overlooking the Tofino Mud Flats wildlife area and are adjacent to a forest preserve. They include pathways around a series of pocket parks, some with natural vegetation of the temperate rainforest, and others having herbs, flowers, and art installations. A small café and gift shop is attached. In 2009, the Board for the foundation and field station decided to widely promote and facilitate the establishment of a "Clayoquot Consortium … that aims to engage academic institutions from around the world in considering and responding to the challenges and opportunities presented by the UNESCO Clayoquot Sound Biosphere Reserve". Once the consortium develops more fully, a separate society will be incorporated for it. The goal over the next five years or so

is to have a membership of about 100 institutions and organizations and to provide a variety of educational programs, research facilities, conferences, and associated services.

Central Westcoast Forest Society, Ucluelet: The Society was established in 1995 to (a) carry out forest and aquatic ecosystem restoration work around the Kennedy Lake area; (b) develop access and interpretive trails such as the Fisheries Restoration Interpretive Drive to view demonstration projects for aquatic restoration, and the 16 km Wild Pacific Trail along the ocean coast from the tip of **Ucluelet** to the Pacific Rim National Park Reserve; and, (c) conduct selected surveys of birds and mammals of conservation interest. Among the last has been fieldwork to designate wildlife habitat areas for special protection such as winter range for ungulates, and breeding sites for marbled murrelets, goshawks, and red-legged frogs (*Rana aurorus*). The Society has developed a business plan for a Clayoquot Community Forest Centre to be located on a highway site near the access road to Pacific Rim National Park.

Ecotrust Canada, Aboriginal Mapping Network: Besides the work of **Ecotrust** with **Iisaak** and with the new ***Forest Communities Program*** noted above, **Ecotrust** was at the forefront of developing training courses for First Nations students in the use of GIS technologies for displaying and managing traditional ecological knowledge about their own territories. Soon after **Ecotrust Canada** was incorporated in 1995, it co-founded the conservation mapping consortium in British Columbia and began developing GIS capabilities with local First Nations in a number of areas, particularly coastal regions. The first courses held in Port Alberni in 1996 for the Clayoquot Sound region were devoted to mapping information that would be required to implement the 1995 Science Panel recommendations. In 1998, **Ecotrust** created the "Aboriginal Mapping Network" as a joint initiative with the **Ahousaht** and Gitxsan First Nations. By the early 2000s, this network was attracting participants from other countries, and in 2006, the Aboriginal Mapping Network was "revamped and re-launched as an interactive global forum for indigenous know-how". In 2010, it co-sponsored an international workshop on "community conservation in practice" with the **World Commission on Protected Areas** (of the World Conservation Union) and the **Global Biodiversity Fund** for members of the I**nternational Society of Ethnobiology** meeting at the **Clayoquot Field Station**, **Tin Wis Resort, Tofino Community Theatre**, and other local locations in May 2010.

Hooksum Outdoor School: This school is an outstanding example of how traditional indigenous knowledge and Nuu-chah-nulth teachings can frame outdoor leadership training. Begun in 2000, the school offers courses on such topics as **Hesquiaht** indigenous knowledge, technical tree-climbing, natural history, and remote surfing, as well as certifications in first aid, sea kayaking, marine radio operation, and boat operation.

Nism'a Project Society: Formed in 2006, the Society provides outdoor education programs for children. It focuses on Nuu-chah-nulth culture, health & awareness, and outdoor skills. Day trips are held at various local sites on weekends for pupils from **Tofino**, **Esowista** and **Ucluelet**. Some youngsters have become regular participants.

Pacific Rim National Park Reserve: Under the terms of the Canadian National Parks Act, 2001, the "…maintenance or restoration of ecological integrity though the protection of natural resources and natural processes shall be the first priority…when considering all aspects of the management of the park" (Section 8 (2)). Canada's National Parks were to have monitoring and reporting systems for ecological integrity fully functional by March 2009, and up-dated park management plans by 2010. Pacific Rim activities are paced by the larger set of on-going Treaty negotiations. Until final agreements are reached, management guidelines for the park serve as a management plan. The 2006 agreement with the **Maa-Nulth First Nations** for cooperation in the planning for the Park omits topics such as renewable resource harvesting and traditional cultural activities, as they may occur in the Park until such time these and other matters are clarified in final Treaty agreements. Park staff have initiated a broad consultation process seeking feedback on draft statements for the 2010 revised general set of management guidelines.

The first ***State of the Park*** report for the **Pacific Rim National Park Reserve** was published in 2008. It reported on the situation with respect to: Aboriginal relationships; ecological integrity; cultural resources; and, visitor experiences, outreach education and stakeholder relationships. The monitoring framework for this covers the "condition" of the subject being reviewed and the "effectiveness" of management actions taken in response to these. Monitoring is applied to each of the three management units of the park (Long Beach, Broken Group Islands and the West Coast Trail). This entails identifying a small number of key indicators and the measurements/data needed to assess them. The system is not complete at this point. It is being developed in consultation with the Central

Region First Nations, who are also members of five separate Treaty tables associated with the park reserve.

Monitoring for ecological integrity is guided by Nuu-chah-nulth principles, especially *Hishuk ish ts'awalk,* or "everything is connected". Conceptually, the key indicators of integrity for the Park are the conditions of six ecosystems that readily exchange energy and nutrients. Conditions are determined by a total of 27 measured attributes. Viewed from the ocean to land, the ecosystem indicators are: the sub-tidal; inter-tidal; shorelines; streams; lakes and wetlands; and, forests. Data from measurements chosen for each ecosystem are judged as good, fair, poor, or undetermined, and their trends as either improving, stable, declining, or undetermined. Field monitoring for the different measures is being phased in over several field seasons. Based on what has already been done, the state of ecological integrity was judged to be fair and stable in terrestrial environments, and fair to poor with some deteriorating trends in the freshwater and marine environments.

Cultural resources such as archaeological sites, historic objects and landscape features were deemed to be generally good; sites for the first two have been documented while landscape features have yet to be assessed. Visitor experiences are generally good based on limited survey information, but infrastructure to service them needs upgrading. There is no information for outreach education or stakeholder relations.

The Wildlife-Human Conflict Specialist at the Park has coordinated the ***WildCoast Project*****,** which has provided a key contribution to the knowledge of ecosystem health and interactions in the region that informs park management. This multi-disciplinary, collaborative study of the links among predators (primarily cougars and wolves), prey, people, and landscape began in 2004 out of concern about the potential for human-predator conflicts due to increased interactions in the region.

The **Wickaninnish Interpretive Centre** in the Park (at the Long Beach Unit and within the biosphere reserve) has been undergoing major redesign and renovations over the past four years. A Nuu-chah-nulth Working Group with people from eight First Nations was established in 2007 to work with the planners and designers for the new Centre. Cultural heritage themes are being integrated with natural heritage themes in various murals, models and exhibits, as well as in signage for some short trails through nearby old growth

forests and to adjacent beaches. The **CBT** has contributed $20,000 in funding to help incorporate the biosphere reserve concept into exhibits. The renovated Centre is to be completed in December 2010 with a grand opening scheduled for ***Whalefest*** 2011.

Raincoast Education Society (RES): While the interpretive centre was opened in **Tofino** in 1995, the RES was incorporated in 2000 and has been a driving force of developing quality, locally-relevant educational programs, interpretive walks, presentations, and materials — not only about the natural environment, but also about biosphere reserve ideals. The RES developed the interpretive signage for the Clayoquot Sound Biosphere Reserve for the **CBT** (see the Photo Interlude). Their overarching goal is to promote an environmentally sensitive future for Clayoquot Sound and Barkley Sound through education and interpretive activities. Currently, the office space and interpretive materials for the RES are housed in the **Clayoquot Field Station**, located within the **Tofino Botanical Gardens**. A Board of eight local residents with a range of educational backgrounds and experience employs three staff persons. A variety of seasonal programs and events are on offer for a diverse array of local groups and organizations, and a large number of booklets, brochures, and other information materials are made available, including some about the biosphere reserve. The RES also has responsibility for stewardship programs for the Tofino Mud Flats Wildlife Management Area.

Strawberry Island Research Society, Tofino: The Society was created in 1997 to foster volunteer "citizen science" field surveys of selected species of marine mammals and birds in the Clayoquot Sound region. Their field observations were informally linked to scientists in the **Department of Fisheries and Oceans, the Vancouver Aquarium, Parks Canada**, and elsewhere where data could be incorporated into related research. Main activities have included recording occurrences of killer whales, gray whales, and Steller sea lion (*Eumetopias jubatus*) haul-out sites. They also started year-round monthly transects to record pelagic sea birds and marine mammals on transects that ran beyond the continental shelf to over the abyssal plain, some 55 km from shore.

The extent of reported field observations seems to have declined considerably over the past several years. The group noted the challenges of finding enough volunteer and experienced boat crews. Meanwhile, the **Cetaceans Sighting Network,** now maintained by the **Vancouver Aquarium** and the **Department of Fisheries and Oceans** with

funding from habitat programs for species at risk, has a database of about 20,000 sightings from British Columbia along with instructions of what to look for to help identify individual animals. Recently, however, the Society has worked on compiling information on the occurrences of cougars and wolves in Clayoquot Sound.

Tofino Steamkeepers Society: This was formed in 2004 by volunteer stewards to promote interest and field skills in good watershed practices. It recently helped set up the **Esowista Streamkeepers** to work in the ***Tribal Park.***

Tonquin Foundation, Tofino: This Foundation was set up in 2003 in order to preserve and interpret information about the early marine heritage in the region. The Foundation is named after a trading vessel, the "Tonquin", that was lost or deliberately destroyed near **Tofino** in 1811. Members of the Foundation search for artifacts and relicts from shipwrecks (e.g., the HERA, 1898) and maintain links with the **Underwater Archaeological Society of British Columbia**. Recently, it has undertaken a project to clean up and provide interpretation for the Morpheus Island burial sites.

Wild Pacific Trail Society, Ucluelet: A volunteer organization dedicated to developing and maintaining a hiking trail, now in seven phases, that connects the tip of **Ucluelet** with the **Pacific Rim National Park Reserve** along the outer coast facing the ocean.

Based outside of the biosphere reserve:

Bamfield Marine Sciences Centre: The Centre, established in 1972, is located in the village of Bamfield on the south shore of Barkley Sound. It is administered by the **Canadian Universities Marine Sciences Society** (five universities in British Columbia and Alberta). The Centre has developed world-class, year-round facilities for research and teaching related to marine and coastal studies. About 60 scientists visit annually. **The School for Field Studies** at the Centre offers courses and directed student field projects. These include five 15-week courses in the fall term and up to 12 six-week immersion courses as well as independent field research during the summer for university students. Collaborative research opportunities are also available (e.g., concerning fish physiology and abalone cultivation for restoration). The Centre hosted ***"The First Barkley Sound Knowledge Symposium"*** in February 2010 and maintains an **OceanLink** website dedicated to information and education about oceans and marine science.

Earthquakes Canada & Pacific GeoScience Canada, Sydney B.C.: Clayoquot Sound is geologically part of a much larger and mainly off-shore region that is the most seismically active in Canada. The activity is caused by two phenomena. One is a Pacific Ridge divide that pushes the ~100 km thick Juan de Fuca plate to the north-east where it encounters the Cascade subduction zone and then dips very deeply below the much larger North American Plate. It has also become somewhat fused (or "locked in") with the latter, some 45 km below the west coast of Vancouver Island (and deeper still to the east). Pressure builds up under these conditions and generates a relatively large number of mostly small earth tremors occurring on average every few days (~300 per year). Very few of these are felt on the surface. The other source arises from the major northwest-southeast large fault in the Pacific Plate that occurs in a deep trench along the subduction zone. This results in a transformation boundary off-shore from the Vancouver Island coast where the Pacific Plate moving to the northwest collides with the North American Plate, itself moving more slowly to the west. Very strong but deep earthquakes can occur when they suddenly slide past one another in the trench.

The two organizations (both with **Natural Resources Canada**) operate the Western Canada Deformation Array of 15 seismic stations placed directly over the land portion of the Cascade Subduction Zone in southwestern B.C. (including one station at **Ucluelet** and another at Bamfield). The stations automatically record seismic activity continuously and relay data to **GeoScience Canada**. Global Positioning System satellites that can measure ground location change as small as a few millimeters annually are used to track small movements in the monitoring stations themselves.

Strong quakes with tsunamis have occurred at least six times in the past 3,000 years along the coast of southern B.C. and northern Washington State. Archaeological evidence combined with Aboriginal oral histories indicated that local villages were destroyed or abandoned for long periods afterwards. The most recent of these severe events was 310 years ago, in January 1700. A tsunami from a major earthquake in Alaska in 1964 destroyed or damaged much of **Hesquiaht's** community and also caused some damage at Port Alberni. A regional tsunami response plan has been developed with information about warnings, tsunami inundation zones and regional evacuation measures.

North Island Collage, 1975: Providing skills training, continuing education and university transfer courses at four campuses and four centres on Vancouver Island, one campus is located in Port Alberni and two centres are located in **Ahousaht** and **Ucluelet**. The campus offers a range of degree programs such as in tourism and hospitality, human services, early childhood care, animal care, business, fine arts and design, health care, trades and technology, and it offers university transfer courses including those in biology, English, geography, and history. The centres offer customized short courses and training to businesses and organizations, allowing people on the West Coast post-secondary educational opportunities. Distance education and on-line courses are also offered.

Northwest Ecosystem Institute, Lantzville: The Institute is a non-profit consulting and research services organization operated by personnel who have affiliations with other institutions, including the **University of Victoria**, and **Fisheries and Oceans Canada**. Its personnel constitute the Board of Directors. The Institute has done considerable work in Clayoquot Sound on watershed atlases, especially for restoration work in the Kennedy Lake area and for Yaakhis Creek in **Hesquiaht**. It does not seem to be as active now as it was five or six years ago.

Pacific Biological Station, Nanaimo: Established in 1908, this is the principal centre for fisheries research on the west coast. It conducts various research and monitoring projects associated with stock assessment and fisheries management, marine environment and habitat science, ocean science and management, and aquaculture. The **Pacific Scientific Advice Review Committee** reviews all scientific information regarding stock assessments for commercial groundfish, pelagic fish, salmon, invertebrates, and habitats.

Pacific Wildlife Foundation, Vancouver (formerly the **Westcoast Whale Research Foundation):** The Foundation conducts independent studies of coastal and marine ecosystems combined with public outreach through media productions. It focuses on just a few projects at any one time. The annual photo-identification sampling of humpback whales in Clayoquot Sound was undertaken from 1995-2007 as part of a wider study of humpbacks in the Pacific organized with the Whale Trust (Hawaii). It indicates there has been a slow recovery of populations that occur along the Vancouver Island coast. Studies are also underway on the role of Pacific herring (*Clupea pallasii*) and herring roe in the food web dynamics of humpbacks and gray whales. Studies on the seasonal abundance

and movements of Steller sea lions (a species of concern) in the Clayoquot Sound and Barkley Sound were started in 2006.

The Director of the Foundation is also the main coordinator for the **British Columbia Breeding Bird Atlas** and intends to map marine birds and mammals along the entire B.C. coast to produce the first Marine Bird and Mammal Atlas for the province. Studies have begun on the seasonal movements of black oystercatchers (*Haematopus bachmani*) at various coastal locations, including Clayoquot Sound. They are considered to be a good indicator of rocky islet habitats with healthy rocky inter-tidal invertebrate communities and are being used for monitoring ecological integrity in the Pacific Rim National Park Reserve.

University of Victoria

- **Clayoquot Alliance for Research, Education and Training (CLARET).** A partnership between the CBT and the University of Victoria (see description above).

- **POLIS (Project on Ecological Governance),** with **SmartGrowth BC**, has undertaken a number of background studies, including topics related to ecosystem-based community forestry, legal aspects of Aboriginal issues, political ecology, and ecosystem-based governance that are quite relevant for issues in the biosphere reserve.

- Faculty members in the **School of Environmental Studies** have established long-term research relationships with people in the biosphere reserve region and particularly with First Nations. Students continue to be mentored in respectful research practices and to carry out research in ethnobiology and on traditional knowledge systems. One study of note was carried out by a local from the region, who worked with the people of **Ahousaht** on the ***Tl'aaya-as* project** to study and help revitalize traditional root gardens in the tidal flats and river estuaries, which had produced root vegetables that had been an important part of Nuu-chah-nulth diets for generations. The School also offered a unique course on **'Community-based Research In Clayoquot Sound'** in 2003 and 2005, which was sponsored in part by, and developed in collaboration with key individuals from **CLARET**. The course

involved field visits to the region with and asked questions such as, what role does academic research play in resolving, or assisting communities to resolve, environmental and social problems? What specific challenges are involved in collaborative research between universities and communities?

- The university's **Whale Research Laboratory** has carried out extensive research on the summer distribution and foraging behaviour of gray whales in Clayoquot Sound.

- Faculty and students from the **Department of Biology** have conducted field research on the theme of "arboreal biodiversity across spatial scales" using insects, arthropods and other invertebrates as evidence of biodiversity in both the canopy environments and the ground litter environments in several locations on the west side of Vancouver Island. Five of their long-term sites are in pristine watersheds of Clayoquot Sound.

University of Washington, School of Oceanography, Seattle, USA: Faculty and graduate students from the **Aquatic Organic Geochemistry** unit in the School have had a ***"Clayoquot Sound Expeditions"*** program for the past 10 years. They conduct annual field and laboratory work on ocean currents and tidal processes for mixing waters, including on: fresh water inflows and warm water spring up-welling into the fjords; the extent of anoxic waters at the heads of inlets and fjords due to the accumulation of bark and other logging debris in the water over the years; and, the bacterial anoxygenic photosynthesis processes associated with these "dead zones".

Vancouver Island University, 2008 (formerly Malaspina University-College): Programs of interest for the Clayoquot Sound biosphere reserve region are (in alphabetical order):

- **Alejandro Malaspina Research Institute, Liberal Studies Department**. The institute promotes research and scholarship on 18th century navigation and first encounters with Indigenous peoples on the Pacific Coasts of the Americas.

- **Community Based Research Institute**. Newly created to develop service learning and experiential education for students who work on research topics identified by community organizations.

- **Institute for Coastal Research.** The idea for this came up in 2001 and was realized with the appointment of the Canadian Research Chair in Coastal Resource Management in 2006. The goal of the Institute is to understand and promote the resilience of coastal social-ecological systems with special attention to those in coastal British Columbia and the Pacific North.

- **Malaspina-Ucluelet Research Alliance.** This was created in 2001 as a co-op education placement for students in the ***Tourism Management Program*** to help with public input/consultations related to a new community vision and planning initiative in the District of **Ucluelet**. This arrangement became a College (now University) Community Research Alliance in 2003 to work on the new Official Plan for **Ucluelet**. The Official Plan and the "grassroots" approach to develop it have received recognition in British Columbia, and also won awards in three categories of a United Nations Environmentally Sustainable Community Competition held in Hangzhou, China, in 2006.

- **Protected Areas and Poverty Reduction – A Canada-Africa Research and Learning Alliance.** This is a five-year project approved in 2009 and funded by ICURA (Canada) for collaborative studies with the **College of African Wildlife Management,** Mweka (Tanzania), and the **Sunyan Polytechnic** in Ghana. Study sites are to include **Pacific Rim National Park Reserve**, **Tla-o-qui-aht *Tribal Parks***, **Serengeti National Park** in Tanzania, and three national parks/protected areas in Ghana.

5c. Other comments from a biosphere reserve perspective

CBT involvement:

Relatively early on, the **CBT** decided to contribute $2,000 annually to each of five annual festivals held in the Clayoquot Sound region. These are (in seasonal order): ***"Pacific Rim***

Whale Festival", for one week in March with a wide range of associated events; ***"National Aboriginal Day"***, June 21st, held in Nuu-chah-nulth communities and at Pacific Rim National Park with musical and dance performances, arts and crafts, story-telling, interpretive walks, and native cuisine; ***Pacific Rim Art Society Summer Festival***, July 1-15, with many music, films and other events; ***"Ukee Days – Life on the Edge",*** late July, with a number of events that serve as a fund-raiser for community projects; and, the ***"Westcoast Maritime Festival"*** (late September) sponsored by the **Tonquin Foundation**, with boat cruises, Coast Guard exhibits, model miniature boat shows, and exhibits of traditional Aboriginal canoes. In earlier years, it also helped fund the ***"Return of the Salmon Festival"*** (last weekend in October), sponsored by the **Wickaninnish Interpretive Centre**, the **Central Westcoast Forest Society** and other groups.

The **CBT** has been the most active in supporting projects and programs sponsored by organizations noted in Section 5 above. A number of these organizations have members serving on the **CBT** Advisory Committees. Some of the main recipients have included the **Central Westcoast Forest Society**, the **Raincoast Education Society**, the **Tofino Botanical Gardens Foundation,** and the **University of Victoria** (for coastal management, arboreal biodiversity research and gray whale/marine mammal studies).

In 2002, the **CBT** and **Genus Capital Management** set up a scholarship program for **Ucluelet Secondary School** students that provided up to $3,000 /year for the duration of their post-secondary studies (up to a maximum of $12,000) providing they maintained a strong academic standing. This was extended to First Nations students from other schools, and for study at accredited post-secondary education or training institutions.

Currently, the **CBT** is renewing efforts to emphasize longer term and larger scale projects in cooperation with other organizations that can also contribute funds and/or other inputs. The intent is to have greater impact and a much enhanced collective capability to provide logistic support in the biosphere reserve.

SECTION 6. Governance and "civil society" context for the biosphere reserve

(Local biosphere reserve groups have to work within extensive overlays of government bodies, business enterprises, and a "civil society" mix of non-government organizations and community groups. These collectively constitute the structures of governance for the area of the biosphere reserve at any given time. Success in carrying out the functions of a biosphere reserve can be crucially dependent upon the kinds of collaborative arrangements that evolve among sets of these other organizations. A key role for the local biosphere reserve group is to learn about the governance system they are in and explore ways to enhance its collective capacities for fulfilling the functions of a biosphere reserve.)

6a. What is the overall framework for governance in the area of the biosphere reserve?

Identify the main components and their contributions to the biosphere reserve. List in a separate Appendix if necessary.

Components include: local jurisdictions; main government agencies and programs that relate to the functions of a biosphere reserve; key businesses and industries; main active non-governmental organizations; and, major collaborations (networks, alliances, coalitions, partnerships).

6a (i) Local jurisdictions (townships/districts, First Nations communities, towns and cities)

The Canadian constitutional framework is set out in the Constitution Act of 1982 (Schedule B, Canada Act, UK 1982, c.11). The Act specifies the division of jurisdictional authority between the federal government and the provinces & territories. For local matters, the primary responsibility for First Nations rests with the federal government, and for other local/municipal governments, with the provinces. The main local jurisdictions in the biosphere reserve region are: **Alberni-Clayoquot** Regional District, Electoral Area "C" (Long Beach); District of **Ucluelet**; District of **Tofino**; and the five Central Region First Nations who belong to the **Nuu-chah-nulth Tribal Council**: **Ahousaht**; **Hesquiaht**; **Tla-o-qui-aht**; **Toquaht**; and **Ucluelet**.

6a (ii) Main government agencies and programs

Main government agencies and programs (federal, provincial, regional sub-provincial, local) that relate to the functions of a biosphere reserve.

Given the scope of activities that biosphere reserves are meant to foster in any given area, local biosphere reserve organizations could be in contact with a large number of government agencies and programs. The major categories of federal jurisdictions that apply include: international affairs and inter-provincial trade; Aboriginal treaty obligations; navigation and shipping; fisheries; criminal law; and, "peace order and good government". Provincial responsibilities include: natural resources; public (Crown) lands; property and civil rights; municipalities (cities, towns, rural districts); and, generally "all matters of a local or private nature". There are ten major federal departments along with 15 provincial Ministries of the British Columbia government, with programs of relevance to the work of the biosphere reserve. In addition, the **Nuu-chah-nulth Tribal Council** has developed a range of programs and services for member communities in the fields of family & child welfare, community health and nursing; education and training; social and economic development; fisheries and aquatic management; and, employment services, including use of information technologies.

6a (iii) Key businesses and industries (main employers)

The geographic location of the Clayoquot Sound region has made it a resource hinterland in a provincial economy that itself has long been (and still is) mainly based on resource exploitation and exports. The "post-industrial" economy in British Columbia is concentrated in the Greater Vancouver and southern Vancouver Island regions of the province. Generally, within the biosphere reserve, employment in the industrial forestry and commercial fishing sectors has declined rapidly since the early 1990s, while employment in the tourism and resort sector (and associated services) has increased substantially. Employment has also increased in the aquaculture sector. This transition was much more abrupt in the District of **Ucluelet** than in the District of **Tofino**. There continues to be a need for more and diverse educational opportunities in the region, including in trades, so that locals can be trained and employed in areas such as

construction. Trades have provided many employment opportunities for skilled workers from outside the region in recent years with increased construction needs.

The economy of these two main communities is based on a number of quite small businesses. In 2006, **Tofino** had 154 registered firms with no employees, and 145 with employees; 124 of the latter had fewer than 20 employees, while at the other end of the spectrum, two reported more than 200 employees, but not all are in **Tofino**. For **Ucluelet**, 123 firms had no employees and 129 had employees, 118 of which had fewer than 20. Three had up to 50 employees.

Table 4: Percent employment by sector for Tofino and Uclulet

SECTOR	TOFINO		UCLUELET	
	1996	2006	1996	2006
Accommodation, food and beverage	23.5	25.1	15.3	19.2
Government, education and health	16.6	13.7	10.2	15.7
Retail trade	13.0	9.0	9.3	7.9
Construction	10.5	10.0	3.6	8.4
Natural resources (forestry, fisheries)	9.3	6.6	15.8	5.9
Manufacturing (including food processing)	3.7	4.3	18.4	9.4
Transportation and warehousing	4.3	6.2	4.6	3.4

Source: BC Statistics – Community Facts
Note: Similar information for First Nation communities is not available

As noted in the ***2009 Clayoquot Socioeconomic Report***, the over-dependence of the regional economy on market-driven high-end tourism with its substantial local impacts makes it very vulnerable to recessions or other external events. The energy that also went into combating declines in resource extraction sectors (logging and the fisheries in particular) has been at the expense of regional collaboration for local economic diversification away from the new "mono-economy" of mass tourism and away from undermining the region's high value environmental assets by using them as disposable economic resources.

(iv) Main non-governmental organizations active in the biosphere reserve

There are about 100 non-governmental and community organizations in the biosphere reserve region or involved with **CBT** that do or can contribute in their own ways to employment and to the different functions of a biosphere reserve. Please see Appendix 4.

(v) Collaborations

Major collaborative groupings involved with biosphere reserve-related activities (networks, alliances, coalitions, partnerships).

The Clayoquot Sound region has a highly rich and varied array of "social capital" and "human capital" it can draw upon to enhance its sustainability. Given the inherent scope of a biosphere reserve and the range of actions already going on, the large number of government agencies that could be involved is quite large, as noted in 6a (ii). There is also an impressive number of non-governmental organizations (NGOs) and community groups, as noted in 6a (iv). The main collaborative groups are ones that have been organized and/or sanctioned by governments, and have government participation in them. These include the **Central Region Board** (whose future is now unclear), **West Coast Aquatic**, the **Nuu-chah-nulth Tribal Council**, and the **CBT**. Of note are the collaborative efforts of the **CLARET** and the **Raincoast Education Society** in developing and delivering programs, projects and communications materials for the realization of biosphere reserve ideals with individuals and organizations throughout the region. Partnerships also form around major projects such as **Ecotrust Canada's** conservation economy and the **Tsawalk Partnership** for coastal planning. There are coalitions of NGOs that perform a "watchdog" role over issues of concern to them, and who remain ready to take up vocal advocacy and/or organized political action should they judge it necessary. Examples include: the **Friends of Clayoquot Sound, Greenpeace** and other wilderness protection or conservation organizations; the **Coastal Alliance for Aquaculture Reform** and the **Wild Salmon Circle** dedicated to the removal of open net fish farms in coastal B.C.; and the **Oil Free Coast Alliance**. There are a number of other formal, less formal or quite informal groups and networks that are contributing to the functions that biosphere reserves are meant to foster. The **CBT** advisory committees and groups supported by the **CBT** are examples.

6b. Role of the biosphere reserve in collaborations

Identify the role of the biosphere reserve organization in these structures (e.g., convenor or co-sponsors of conferences and workshops, leader in networking processes, members of advisory boards, funded project activities, managed projects as a stakeholder in some larger endeavour).

Before the biosphere reserve designation

Some 15-20 years of bitter disputes had occurred in the Clayoquot Sound region over the massive industrial forest operations and declining fisheries caused in part by destructive logging practices. The first organized protests in 1984 challenged a corporate decision to clear-cut Meares Island (where the community of **Opitsaht** is located), a sacred site for the **Tla-o-qui-aht** and **Ahousaht** First Nations and the source of freshwater supply for the District of **Tofino**. In 1985, a court-ordered injunction halted logging until a Treaty agreement was reached, and the **Tla-o-qui-aht** First Nation declared Meares Island to be a Tribal Park.

Peaceful protests against industrial logging anywhere in Clayoquot Sound had become particularly intense by the late 1980s and early 1990s. By then, organized but nonviolent protests were engaging people from across Canada. The protests had attracted considerable international attention, especially in Europe and the United States, and many people traveled to B.C. to join. Protesters staged media campaigns, and some lived in trees and/or blocked access to logging roads for months at a time while generally maintaining a convivial, festive atmosphere. Many were camped out in a "Peace Camp" set up in a large clear-cut site of charred forest, stumps and logging wastes at the major highway junction in the area that reminded everyone of what they were opposing. An estimated 10-12,000 people gathered in Clayoquot Sound during the summer of 1993; about two-thirds were women of all ages, some with small children. About 870 people were arrested and subjected to mass trials, and some were jailed in what is one of the largest civil disobedience events in Canadian history. Other groups successfully organized campaigns for consumer boycotts of products using logs from the Clayoquot region (or generally from anywhere in British Columbia). While some First Nations objected to the massive clear-cutting operations that also degraded salmon spawning

sites and helped lead the protests, they had little influence over the politics of the protests that were organized to stop it.

This situation generated a legacy of bitterness and distrust, especially among First Nations, wilderness protection groups and industrial corporations; between the corporate executive class joined by former employees of the resource extraction industries and "environmentalists" or anyone else coming from "outside" to protest; and, between and among long-time residents and many newcomers attracted by and/or benefiting from tourism developments that have now become the main base of the local and regional economy.

Conversely however, it also brought forth a determination to resolve these issues and find innovative ways for doing business and building communities. A **"Clayoquot Biosphere Project"** was initiated locally in 1991 with assistance from **Ecotrust** USA, founded the same year in Portland, Oregon. Both were supportive of the idea of a biosphere reserve. The **B.C. Commission on Resources and Environment (CORE)** issued a report in 1993 that recommended (among other things) that the government support the designation of Clayoquot Sound as a UNESCO biosphere reserve. The government accepted this recommendation. At about the same time, **Ecotrust** started working in coastal British Columbia to demonstrate collaborative approaches for resolving these kinds of disputes with large resource extraction industries.

In 1990, elaborate arrangements for Treaty negotiations between the federal and provincial governments and the First Nations were established throughout British Columbia. The decision to seek a UNESCO designation was endorsed by the Clayoquot Sound **Central Region Board** in 1996; the Board was established under an interim "bridge to treaty" agreement in 1994. The Clayoquot Sound Biosphere Reserve was designated by UNESCO/MAB in 2000. (Please see Section 6c for summaries of the Treaty processes and results.)

The Clayoquot Biosphere Trust (CBT)

The **CBT Society** was incorporated in 2000 to be the administrative organization for the biosphere reserve. It was set up as a co-management organization modeled after the

Clayoquot Sound **Central Region Board,** with Board members drawn from the same communities and following similar rules for voting if a decision was required but a consensus could not be reached. The Board is composed of ten people: one Director and an Alternate from each of the five Central Region First Nation communities and from the Village of **Tofino**, District of **Ucluelet**, and Area "C" of the **Alberni-Clayoquot** Regional District, plus two At-Large Directors. It also has four Ex-Officio representatives from three federal departments and the province of British Columbia. The Board has two Co-Chairs (one from one of the five Nuu-chah-nulth First Nations communities, and the other from one of the three other communities), with other Directors elected or re-elected at Annual General Meetings (AGMs). Earnings from the $12 million endowment fund, established in 2000, cover the overhead and operating costs of the CBT, including grants awarded to community organizations (please see Section 2 c(ii) for information about the fund).

The original expectation at the time it was created was that the **CBT** would play a positive but not intrusive "healing role" for the biosphere reserve region by fostering constructive dialogue among local stakeholder groups and communities. Some people saw this as the latest attempt at a means for establishing innovative sustainable resource and environmental management practices and institutions in the region after the ***Science Panel*** and ***Long Beach Model Forest***; others saw it as a complementary role to that of ***Iisaak*** in the forestry sector. It was recognized that operationalizing the **CBT** would be a slow process of building trust, mutual recognition and acceptance. Treaty negotiations provided the larger immediate context, restricting the availability of some First Nation Directors to participate in **CBT** meetings and thus influencing the pace of **CBT** decisions and directions.

In its first ten years, the **CBT** has had three Executive Directors and one Interim Executive Director (Thomas C. Esakin, 2000-2001; Stan Boychuk, 2002-2007; David Fraser, Interim, 2007-2008; and Curtis Cook, 2008 – current). The first year or so was pre-occupied with start-up logistics and seeing to it that the necessary legal and procedural requirements were put in place. The first Executive Director also held visioning sessions in various communities, published informative articles about the biosphere reserve in local papers, copyrighted the **CBT** name, and sought advice from an advisory committee of local residents.

The second Executive Director was appointed following a consultation process with local interest groups and residents. The biosphere reserve began to experience a greater acceptance from local residents by assuming a "reaching out to the community" approach while also not being perceived as aligned with a particular type of interest group. An early decision was to provide $2,000/year routinely to each of five annual festivals in the region that attract a lot of local visitors and publicity. The second Executive Director was community-oriented, often serving informally as a volunteer on advisory or organizing committees of community groups. These festival and volunteer efforts were seen as ways to build recognition and acceptance within the larger community. The **CBT** also created a website and brochure materials about who they are and what they do, and developed work plan statements with long-term goals to direct their own activities as well as expectations within the community. Under the second Executive Director, they also hired Coop students from the University of Victoria (e.g., to compile a directory of the non-governmental organizations in the region) and embarked on major initiatives and partnerships such as **CLARET**, a community-university research alliance between the **CBT** and faculty from the University of Victoria (2001-2004), with several associated projects and events (see Section 5b).

There were apparently a number of disagreements and tensions within the Board in the earlier years. In part, they were fueled by recent memories and experiences of the 1993 blockades and continued disputes following along from it, and by the fact that the trust fund had been approved before the biosphere reserve designation was granted. When the Board made its decision in 2002 to begin project funding, the formal process with accompanying procedures for the granting of monies for projects was adopted by the Board and referred to at Board meetings and at AGMs.

The result was that the Fund became viewed as a community resource, with some members of the **CBT** Board representing different community factions each seeking a share of "their" resources to help meet pressing local needs. Acceptance of the biosphere reserve concept and of drawing upon trust funds to meet diverse aspirations and expectations of what the designation entailed was not well received at the time by all and thus was the focus of considerable discussion. In addition, the very structure of the **CBT** includes communities outside of the official biosphere reserve boundary as well as the requirement for consensus decision-making. This meant that the organization was

vulnerable to Board members who were not prepared to operate in the spirit of consensus, but who saw themselves as champions for what they perceived to be the best interests of their own community.

While subsequent changes in the membership and processes of the Board attempted to address questions of where the Fund should be allocated, it also resulted in a sharper division between some members who saw the Fund entirely as the source of help to serve urgent local needs and other members who wanted to see much more of it devoted to various initiatives that would exemplify long-term, big-picture biosphere reserve ideals, and to see the **CBT** demonstrate strong leadership in initiating and promoting them. As a result, it was not unusual that the **CBT** Board experienced long arguments over what to some seemed to be minor points, procedural wrangling and, in a few cases, expressions of resentment against the biosphere reserve idea itself. While they still have debates, the current Board members report that the rancor of earlier times has gone and that the Board is quite collegial in matters they discuss.

A turning point in public perception and acceptance of the biosphere reserve seemed to have occurred in the summer of 2003 under the leadership of the second Executive Director, when the **CBT** put out a call for community projects and was able to fund five with a grant of $10,000 each; June 2004 saw the third call for community proposals. As well, several **CLARET** initiatives generated locally-relevant discussions and outputs, including the well-attended and successful ***Clayqouot Symposium*** (November 2003), the ***Nuu-chah-nulth Central Region Language Project*** book and DVD, the consultative development of the ***Community University Connections Protocols Project,*** the ***Clayoquot Sound Regional Web Atlas***, a consultative development of community research needs for the region, the ***Iisaak Sustainable Forestry Project*** (a model for monitoring and capacity-building), the ***Raincoast Host Program*** (aimed at tourism staff), the ***Clayoquot Sound – Mamook Broadband Access Project,*** and a database that inventoried research and documentation about the region. These tangible benefits, combined with a policy of inclusion, created a broader acceptance of the biosphere reserve concept because of its relevance to community desires and goals. The **CBT** also created a website and various materials about who they are and what they do.

By 2005, there were increasing attempts, guided by the **CBT** Board, to formalize program activities to a degree. As spelled out in the 2005-2007 three-year business plan at the time (up-dated and approved annually), it was decided that five local advisory committees be created around specific themes. They were to draw members from each of the First Nations and non-aboriginal communities who would themselves constitute informal networks connected with other networks with whom each individual was affiliated. Each committee would ideally have about 10 members who would be appointed for two-year renewable terms, and each committee was to have $15,000 annually – $5,000 was to cover their own expenses for meetings, and $10,000 for use as discretionary funds that the advisory committees could allocate (in the $1,000-$2,000 range) to start-up or help very small groups deemed to be worthy of encouraging. All of this was subject to approval from the **CBT** Board. The committees were: community development; cultural; educational; marine & aquatic; and terrestrial.

While some committees were difficult to get going and/or seldom met, others were reported to be quite effective in bringing greater community understanding and cohesion into the work of the CBT. The Interim Executive Director developed organizational arrangements for roles and functioning of the Advisory Committees and oversaw the reorganization of the **CBT's** information system. The development committee was re-cast in 2009 as the Common Ground Committee to promote open house style gatherings and more community outreach work. The current Executive Director reports that recent experiences with the committees have been quite positive, with dedicated volunteers playing significant technical and advisory roles to help inform the **CBT** Board and staff.

A Community Coordinator was hired in October 2005, an Office Manager was hired in July 2006, and a Development Officer (Biosphere Programs, Policies & Communications) was hired in February 2009. The **CBT** had office space in the Pacific Rim National Park Reserve Administration building until early 2004. The **CBT** then obtained **Ucluelet** office and **Tofino** offices in 2004 and October 2005 respectively; the former was closed in June 2008.

In 2006, in part to fulfill the monitoring role of a biosphere reserve, the **CBT** agreed to support a collaborative initiative to develop a comprehensive set of some 12-15 indicators for community health. These drew together and supplemented data gathered by various

individual projects in an understandable format that tells a larger story in ways that people can understand more easily. Literature reviews were done, workshops were held, and a draft set of qualitative indicators has been agreed upon. These include indicators of Nuu-chah-nulth language, resource harvesting activity, species at risk, climate change, marine health, gender equity, early childhood education, youth, waste, transportation, unemployment, and nutrition. Data for them are being compiled as opportunities allow.

In 2007/8, the **CBT** identified three **core priority** project themes they intend to pursue in the years ahead. They are: ***Connecting People with Place; Practicing Sustainability; and Building a Biosphere Centre.*** The initial project for the first priority is to create a Biosphere Youth Council that would in turn be assisted in building a youth-driven regional program, expand it and eventually provide an international model through the **UNESCO Associated Schools Program Network (ASPnet)** and/or associated follow-up under the **UN Decade of Education for Sustainable Development** (2005-2014). "Practicing sustainability" will be pursued through cooperation with the **Ecotrust** Canada conservation economy initiatives, and the new ***Healthy Food, Healthy Communities*** Program involving a number of community organizations that are addressing issues of nutrition and food security in the region. The "Biosphere Centre" is a three-year project still in the planning stages.

All of the above are being done under up-dated **CBT** statements of its *Vision, Mission, and Strategic Goals & Objectives*. The latter have been summarized under the categories of *Model, Research, Educate, Train, Culture, and Build*. Priorities pursued by the current Executive Director have been to: acquire a larger, waterfront office building in **Tofino** (January 2010): improve office functioning that includes a new computer network; improve public access to archived scientific, historical and cultural publications and data housed by the **CBT**; regain charitable status for the **CBT**; activate a **Fund Development Committee** to pursue relevant grant opportunities from government and non-governmental organization sources; improve communications and marketing (including online social marketing) of the biosphere reserve; and, implement corporate and individual donor campaigns as well as Director-led fundraising.

The situation at the time of the periodic review had officially been summarized by **Environment Canada** in a report under "Up-front multi-year funding" to the **Treasury Board of Canada** for fiscal 2010-2011:

Summary of annual plans of recipient: The CBT's Core Priority projects begin in this period in support of the themes – Connecting People and Place, Practicing Sustainability and the Biosphere Centre. These are the Biosphere Reserve Youth Council Programs, the Healthy Food, Healthy Community Initiative and establishing a Clayoquot Biosphere Centre. The CBT will build on modest budgets for these multi-year initiatives by pursuing grants and private donations, as well as securing partnerships that can provide financial or in-kind contributions and lead specific project tasks. CBT will continue to build its fundraising and fund development capacity to bridge the gap between planned budget expenditures and the annual interest and dividend from the Endowment Fund.

Fundraising will focus on the Core Priority projects and a Measuring Community Health program. A targeted corporate donor campaign will be implemented and the CBT's website will be improved to allow for individual donations. Volunteer Advisory Committees will continue to play a critical role in CBT programming, providing technical expertise and ongoing feedback. Four Committees will operate in this period – Culture, Education, Terrestrial, Marine and Aquatic - and the Community Development Committee will be replaced by a Common Ground pilot project. A new Code of Conduct for Advisory Committee volunteers will be implemented.

As the CBT heads into a 2010 UNESCO review, it will engage Biosphere Reserve community members and leaders, securing their feedback on its performance and profile to date. CBT will host a UNESCO review team and work collaboratively to complete the required review and reporting. Workspace improvements, updated technologies and communications tools and new roles and responsibilities for CBT employees are planned to achieve improved operational effectiveness and efficiencies. A new Code of Conduct for Staff will be implemented.

6c. Main governance changes and the role of the local biosphere reserve organization

What have been the main changes in overall governance for the biosphere reserve during the past 10 years? What general experience has the biosphere reserve organization had from fostering collaborative endeavours to enhance the governance capacity in the biosphere reserve. What seemed to work, what didn't?

The overall governance for the Clayoquot Sound region has been steadily evolving over the past decade. This arises in part because of major changes to its economic base, but even more so because of Treaty negotiations between the federal and provincial governments with groups of First Nations communities. Ongoing treaty negotiations at this large scale, which embraces the entire Clayoquot Biosphere Reserve region, deserves

attention even though, or especially because it is unique among Canadian biosphere reserves.

For various historical reasons, British Columbia is the last major jurisdiction in Canada to take up a Treaty-making process to clarify the nature and extent of aboriginal rights and title to traditional territories throughout the province. The Canadian Constitution Act, Part II (Rights of the Aboriginal Peoples in Canada) Section 35 (1) declared that: "The existing aboriginal and treaty rights of aboriginal peoples of Canada are hereby recognized and affirmed". In British Columbia these rights still had to be specified more clearly while taking into account major Canadian Supreme Court rulings on several cases in Canada.

Treaty negotiations

In 1990, the provincial government along with the federal government agreed to enter negotiations and met with a "***First Nations Summit***" that agreed to represent the interests of First Nations that chose to participate in a Treaty process. **A British Columbia Treaty Commission** was then established as an independent body to accept First Nations into the process and determine when the parties are ready to start negotiations. There is a six stage formal process: 1) the Commission reviews a statement of intent from a First Nation that identifies who it represents, the geographic region it will cover, and evidence to show that who it represents agrees with this; 2) the Commission convenes meetings of the three parties to provide information, consider criteria that determine their readiness to negotiate, and identify general issues of concern; 3) a Framework Agreement, rather like a table of contents for a Treaty, is agreed upon with timetables for negotiations; 4) an Agreement-in-Principle (AIP) identifies expected outcomes that will define the rights and obligations of each part. The AIP has to be submitted for formal approval by each party; 5) a Final Treaty having all the technical and legal issues spelled out for ratification by each party; and, 6) an Implementation Agreement to set out how and when each main component of the agreement is to be implemented, including the phasing in of policy, administrative and funding arrangements needed to accomplish this.

Most First Nations agreed to participate, some as individual communities (bands) to negotiate on their own; many were represented by Tribal Councils that brought together communities having the same language, culture, and regional traditional territories. As of

early 2010, there were 49 “negotiating tables” in British Columbia involving 116 First Nations (about two-thirds of the total in B.C.); 43 were negotiating (or were stalled at) stage 4 (the AIP). The **Nuu-chah-nulth Tribal Council (NTC)** was the negotiating body for 13 of 14 First Nations communities in their traditional territories (i.e., the west coast of Vancouver Island up to the height of land on the coastal mountain range immediately inland to the east); several communities chose to negotiate separately. The 12 members of the **NTC** include all of its Central Region’s five First Nations residing in, or partly within the Clayoquot Sound biosphere reserve region.

The **NTC** entered the Treaty process in January 1994, a Framework Agreement was reached in February 1996, one community (outside of the Central Region) withdrew from the process in 2000, and an AIP was initialed in March 2001. In the voting process that went on over the next year or so, six First Nations, including three in Clayoquot Sound, voted against the AIP and six, including two in the Clayoquot Sound region, voted in favor of it. The main contentious issue appeared to be commercial fishing rights. Those who approved the AIP also accepted the terms and conditions for commercial fishing in force by the Department of Fisheries and Oceans under the federal Fisheries Act. Those who rejected it believed their aboriginal rights and title allowed them to operate their own commercial fisheries. This would go beyond their constitutional rights to fish at any time for their personal consumption or use on social or ceremonial occasions. In 2003, the three First Nations in Clayoquot Sound joined another six to launch a case in the Supreme Court of British Columbia to obtain a ruling on their rights and title respecting commercial fisheries. The formal proceedings ran from 2006 to 2009. The Court ruled that the First Nations did have a right to harvest and sell all species of fish in their territory, but not on an industrial scale, and that they should negotiate ways that this can be done with the federal authorities. The **NTC** seemed generally satisfied, British Columbia accepted the decision, but the federal government appealed it. Talks are reported to be underway with **Fisheries and Oceans** about implementing the Court decision.

Meanwhile, the two First Nations who accepted the AIP withdrew from the **NTC** and joined three other First Nations who had approved it to form the **Maa-Nulth Treaty Society** in 2003. They subsequently reached a Final Agreement that was formally agreed to by all parties by December 2008, and was formally ratified by the federal parliament in June 2009. Although the **Tla-o-qui-aht** First Nation had rejected the AIP, they on their own

negotiated an ***Incremental Treaty Agreement*** in November 2008. This was an innovation in the process that the other parties accepted in order to find ways to move the stalled AIPs along. Instead of having to agree on everything before implementing anything (the implications or consequences inherent in the formal six stage process), the agreement was to implement whatever may have been agreed to, say parts of an AIP, while continuing negotiations for the rest. While still in stage 4, **Tla-o-qui-aht** First Nation has secured some transfers of Crown lands to them, along with some funding to enhance their capacity to do more, and they identified the 55,000 ha ***Ha'uukwin Tribal Park*** over much of their traditional territory.

In addition, some of the above First Nations are now actively discussing a new Constitution for their communities. One issue of considerable interest is how to create a governing structure that would incorporate the traditional Hereditary Chiefs and their central advisors (senior heads of extended kinships, referred to as "Houses" or "Clans") in an executive role and combine it with the administrative staff and experience gained through the elected Band Councils under the "Indian Act" provisions of the federal government that are to be replaced. All of this would have to be within the framework of the Constitution of Canada and the Canadian Charter of Rights and Freedoms. In January 2009, the **Ahousaht** and **Hesquiaht** First Nations issued an announcement to all concerned that they have united to pursue the following: advance their inherent Aboriginal title; to exercise their traditional laws and authority over their territories; to give expression to their own self-governance under their Hereditary Chiefs system; and, that henceforth, any and all economic activity in their territories must be formally granted permission, and with conditions set by them.

"Interim measures agreements"

These agreements were introduced at the start of the Treaty process in 1993. They are used to protect, manage, or use land and resources before Final Treaties are concluded. They can provide some immediate benefits for First Nations, by serving as a framework for developing their Treaties. They are also meant to give some degree of certainty for land management and business investments. As of early 2010, there were some 75 such agreements in effect in British Columbia.

The Clayoquot Sound **Central Region Board** was established under an interim agreement by the provincial government in 1994. The Board was a co-management organization with equal representation (and two Co-chairs) from the five First Nations in the biosphere reserve area and from the municipal districts of **Alberni-Clayoquot**, **Tofino**, and **Ucluelet**. Consensus was sought and if a vote was required, the double majority rule applied. The **Central Region Board** reviewed all resource use and development proposals (except those for marine fisheries) to make sure they incorporated the principles for ecosystem-based management and traditional aboriginal knowledge. These principles had been articulated by the ***"Scientific Panel for Sustainable Forest Practices in Clayoquot Sound"*** and were approved by the provincial government in 1995.

Besides its tasks of recommending approval for watershed and forestry plans in compliance, the Board also participated in the development of regional economic development strategies and advised the Parties on planning processes and strategic initiatives. Final approval authority remains with the province. This interim agreement was named the ***"Interim Measures Extension Agreement: A Bridge to Treaty"*** in 2000, and had to be extended several more times up to and including 2008. The province reduced funding for the Board for 2009, and by early 2010 the future was not clear. There was some speculation that the **Maa-Nulth** First Nations would withdrawing from the Board now that they have final Treaty agreements. There are reservations within the government about continuing a largely independent regional planning and management oversight agency with the experience and influence the Board had acquired, especially since it was intended only to be an interim arrangement. With the federal Indian Act slowly being replaced, the province was thought (by some) to prefer dealing with First Nation communities individually, viewing them as just a special kind of municipal government. "Municipalization" would most likely be unacceptable to First Nations; in Canada, municipalities are administrative entities created by and reporting to provincial governments.

Toward a new relationship

In March 2005, and given a sense the whole Treaty process was becoming bogged down, the B.C. provincial government began meetings with provincial First Nation organizations to explore other possibilities. The main idea was to deal directly on a government-to-government level based on respect, recognition and accommodation of Aboriginal title and rights as a basis for the reconciliation of Aboriginal and Crown titles and jurisdictions. In 2009, the government announced its intention to introduce a provincial Recognition and Reconciliation Act, based on a widely circulated discussion paper on its intent and main content. There were mixed and sometimes strong reactions to this from a number of interest groups in British Columbia, and the proposed legislation is currently on hold. But it does seem to have opened the door for alternative arrangements throughout the province. The **Tla-o-qui-aht** First Nation's negotiation of an incremental Treaty process within Clayoquot Sound is an example.

6d. Other comments/observations from a biosphere reserve perspective

None.

SECTION 7. Conclusions

Note: This section is from the UNESCO/MAB (first) periodic review form.

Brief justification of the ways in which the biosphere reserve fulfils each criterion of Article 4 of the Statutory Framework for the World Network of Biosphere Reserves. Refer to other sections of this report if appropriate.

7 (iv) The biosphere reserve should encompass a mosaic of representative ecological systems representative of major biogeographic regions, including a graduation of human interventions

The mosaic still applies as noted in the UNESCO/MAB Directory. The population data should be up-dated using 2b (ii) above. Please see Appendix 1.

7 (ii) The biosphere reserve should be significant for biological diversity conservation

Yes, it remains very significant for biodiversity conservation, especially as it protects some of the few remaining intact temperate zone rainforest watersheds in British Columbia, also thought by some to be the only ones left in the northern hemisphere. Biological surveys over the past decade have documented more of this biodiversity; examples include studies of macrofungi and arboreal canopy-living invertebrates representing a number of different biological Families and Genera, and of species at risk.

7 (iii) The biosphere reserve should provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale

This opportunity is being explored in a number of different ways as summarized in Section 3 above.

7 (iv) The biosphere reserve should have appropriate size to serve the three functions (as set out in Article 3)

The biosphere reserve covers about 3,000 km^2 extending from the coastal zone configurations at the interface of the Pacific Ocean through to the watershed divide at the top of the nearby inland coastal mountains. This provides ample space for the three functions. In recent years, there has been some discussion by members of the **CBT** about the possibility of extending the official biosphere reserve south from the present location defined by the Kennedy Lake watershed to include adjacent lands and watersheds draining into Barkley Sound that would include the territories of the **Ucluelet** and **Toquaht** First Nations, and the District of **Ucluelet**.

7 (v) The biosphere reserve should have appropriate zonation to serve the three functions

It does, as noted in Section 3b above.

7 (vi) A biosphere reserve should have organizational arrangements for the involvement and participation of public authorities and local communities in carrying out the functions of a biosphere reserve

The **CBT** is the designated convener organization for the biosphere reserve and is organized as a representative co-management organization for the purpose. It has a $12 million endowment fund. Earnings from this fund cover annual administrative expenses and enable about $70k-$100k of funds to be allocated each year for community projects that focus mainly on the logistic function of the biosphere reserve.

7 (vii) A biosphere reserve should have:

a) provisions to manage human use and activities in the buffer zones;

b) a management policy or plan for the area of the biosphere reserve;

c) a designated authority or mechanism to implement this policy or plan; and,

d) programmes for research, monitoring, education and training.

There is no one "master plan" for the biosphere reserve, given that the designation does not have some over-riding legal, regulatory authority. Different communities and socio-economic sectors have their own plans set within the larger context of Canadian federalism and an evolving set of governing relations with the First Nations as explained in Section 6. The governance is a mix of resource and community planning and market-driven development by private interests. Research, monitoring, education and training are conducted by a variety of organizations and qualified individuals, and the **CBT** has contributed to these endeavours (e.g., through **CLARET**), as well as to some planning or pilot projects that are consistent with the functions of a biosphere reserve.

7 (viii) Does the biosphere reserve have cooperative activities with other biosphere reserves (exchanges of information and personnel, joint programmes, etc.)?

At the national level

The **CBT** participates in the **Canadian Biosphere Reserve Association (CBRA).** It has hosted annual meetings of the Association twice in the past 10 years (in 2000 and 2008); the 15 biosphere reserves in Canada take turns hosting meetings to give those in the network a chance to learn more about what is being done "on the ground" and an opportunity to exchange ideas and experiences. The second Executive Director (Stan Boychuk) served as Chair, President and Co-Chair of CBRA from 2004-2006 (through a time of CBRA restructuring). It also maintains an informative website, and contributes information to CBRA newsletters or occasional summary reports.

Through twinning and/or transboundary biosphere reserves

The Clayoquot Sound Biosphere Reserve has not done this to date, although the CBT has been approached by biosphere reserves from around the world. There is growing bi-national cooperation in coastal and marine research along the west coast of North America and in a body of water now known locally as the Salish Sea (Puget Sound, Strait of Georgia, and Strait of Juan de Fuca). This cooperation has not yet been extended to the region of the biosphere reserve. However, the **Clayoquot Field Station** has hosted research personnel from the **University of Washington** who have been carrying out oceanographic studies in Clayoquot Sound for the past decade.

Within the World Network (including Regional Networks)

Some people from other biosphere reserves (e.g., the Rhön Biosphere Reserve in Germany) as well as senior staff from UNESCO/MAB have visited Clayoquot, but there has been no formalized twinning or other relationships. In 2005, the second Executive Director of the **CBT** attended the biannual Euro-MAB Conference in Vienna and Sholsherinstien, Austria as a delegate from the Canadian Commission for UNESCO, as a presenter on activities in the biosphere reserve contributing to the UNDESD, and as being moderator for a number of sessions. The former Interim Executive Director of **CBT** attended the Third World Congress of Biosphere Reserves in Madrid, February 2008.

Obstacles encountered, measures to be taken and, if appropriate, assistance expected from the Secretariat

As noted above, especially in Section 6, the pace and priorities of the **CBT** are set within the context of Treaty negotiations that have been underway for the last 20 years and of the historical conflicts over resource use (logging, in particular). Treaty negotiations and overcoming past conflicts can be slow and tedious for all concerned. It is not so much a matter of obstacles as it is of persistence and continued determination to create an empowered co-management governance structure that can then proceed in working towards enhanced sustainability for all in the region. These are the main measures to be taken, and most have to be done locally.

7 (ix) Main conclusions of the reviewer(s)

1. The Clayoquot Sound Biosphere Reserve continues to meet the requirements for a biosphere reserve designation as articulated in the ***Seville Strategy*** and ***The Statutory Framework of the World Network***.

2. The changing institutional arrangements for governance of the biosphere reserve region, arising as the outcomes of Treaty negotiations with the Nuu-chah-nulth Central Region First Nations, have exhibited innovations in the self-governance for individual communities and in the "empowered co-management" capabilities and partnerships for the region. These appear to be approaching a transformation stage with little indication of what might emerge in the years ahead. The **CBT's** structure reflects these changes in the region toward co-management. Through financial support of initiatives such as the ***Nuu-chah-nulth Central Region Language Project, Ahousaht Clean Harbour Project, Grief and Loss Program, Ahousaht Youth Centre,*** and the ***N'isma Project***, and past community outreach activities such as the **Clayoquot Alliance for Research, Education and Training (CLARET)** ***Clayoquot Symposium*** and ***Nuu-chah-nulth Language Group*** projects, as well as the week-long ***Celebration of the Biosphere*** in **Ahousaht**, the **CBT** has demonstrated its support for First Nations and community organizations, and collaborative endeavours that have strengthened cooperation among them. The **CBT** is encouraged to continue to do so.

3. The **CBT** is well-known among people who have participated in its Board and Advisory Committees, in the former **CLARET** partnership and among the many beneficiaries of its financial or in-kind support over the past decade. Some people, however, are concerned that by responding to the immediate problems faced by communities, insufficient attention has been given to longer-term, big-picture thinking about alternative strategies that are more sustainable, as urged in the ***2009 Clayoquot Socioeconomic Report*** (sponsored by **Ecotrust Canada** and the **CBT**), in previous needs assessments and visioning exercises, and in the **CLARET 2003** ***Clayoquot Symposium*** pre-meeting and post-event summaries. Many informal comments and expressions of concern heard by the review committee during its visit resonated with the findings of that 2009 report. Residents and organizations desire the **CBT** to take a leading role in initiatives such as a regional gap

analysis that takes stock of various needs previously identified in different communities, and coastal planning.

4. Despite having an informative and regularly updated website and past community outreach efforts, the biosphere reserve concept and ideals appear not to have been communicated sufficiently to create widespread public understanding. Although the **CBT** has long contributed funding to major seasonal events in the biosphere reserve region, it does not appear to have much visibility at them. Much of this might be rectified if **CBT** would draw upon information from its archive of past projects to develop different narratives for a communication strategy that shows what the biosphere reserve does in the region. Further, in her ongoing research, Ms Mendis-Millard found that residents, including those that sit on the advisory committees, desire the **CBT** to have more of a visible presence in each of the seven communities, particularly in the five Central Region Nuu-chah-nulth communities. Board members who act as active "exchange agents" between the communities they represent and the **CBT**, and/or who also work with others within their communities to do so, would be an asset.

5. Some members of the **CBT** have raised the possibility of formally extending the official boundary of the biosphere reserve to include the communities that the CBT's representation and funding reaches. If, after community consultations, a request to extend the transition area is received from the **Ucluelet** and **Toquaht** First Nations and the District of **Ucluelet**, we recommend its approval by the **CBT** Board of Directors. All three entities are regular participants in the **CBT's** work and have had representation on the **CBT** Board of Directors from the outset. CC/UNESCO can advise on the procedure to follow for obtaining recognition of this addition from UNESCO/MAB. During the site visit, the idea of extending the official boundary to include the north shore area of Barkley Sound raised the question about how the Barkley Sound region itself would qualify for a designation of recognition as a quite separate, but adjacent biosphere reserve. There appeared to be some informal interest in exploring this question.

7(x) Directions to pursue based on the findings from this review

1. **CBT** should continue to develop and participate in shared-cost collaborative projects such as those with **Ecotrust** and different community groups, along the lines of recent initiatives and the past success of **CLARET**. Among other things, this would address the "conservation economy" value-added potential noted in the ***2009 Clayoquot Socioeconomic Report*** as a critical means for securing the future of the communities in the region. Given that the **CBT** has a broad mandate for "sustainability", it would be appropriate to work with other organizations such as **Ecotrust** on regional issues, to undertake gap analyses to identify priority needs, and to strive to direct program activities and partnerships to address these.

2. To advance the **CBT** ***Communications and Promotional Strategy*** (2009-2011 Business Plan) and also illustrate what the biosphere reserve itself does and how it is relevant, prepare narratives in various formats about collaborative programs or projects funded in part by **CBT**. Communications efforts would benefit from drawing upon a wealth of material in the archives, supplemented where possible by interviews with people who had been involved in them. A current example (that the reviewers heard about during their site visit) is the **CBT**-supported initiative with the **Hesquiaht** First Nation to help develop their local food security program, and the **CBT**-funded work underway for the **Ucluelet Community Food Initiative.** Both are viewed in the context of the ***Healthy Food, Healthy Communities*** program, and have considerable potential to become region-wide initiatives with more participating organizations. The Nuu-chah-nulth ***Ha-shilth-sa*** newspaper might be of particular help in this regard.

3. As noted in 7 (ix) #5, and in consultation with the **Tsawalk Partnership** and the communities of Barkley Sound, initiate an exploration of the desirability and feasibility of creating a Barkley Sound Biosphere Reserve. The major components for it already exist. The marine environment, extending east to Port Alberni, is widely recognized to be of considerable social-ecological significance, especially given the research work undertaken by the **Bamfield Marine Sciences Centre** as well as the intensive marine planning initiated under the **Tsawalk Partnership** by **West Coast Aquatic** in 2009. A major 10,607 hectare "core area" of over 100 islands, islets and rocky outcrops is protected by the Broken Group Islands Unit of the Pacific Rim National Park Reserve. This potential

biosphere reserve would have to be accepted and overseen by the Hupacasath, Huu-ay-aht, Tseshaht, **Toquaht**, Uchucklesaht, and **Ucluelet** First Nations given that some or much of their traditional territories might be included, and by **Alberni-Clayoquot** Regional District (including Bamfield), Port Alberni, and the District of **Ucluelet**. Organizational arrangements for this would have to be quite separate from the **CBT** itself, but possibly modeled on it in some way. Pursuing a Barkley Sound Biosphere Reserve designation may be desirable for several reasons. Besides being the first marine biosphere reserve in western Canada, useful comparisons could then be made between applying the biosphere reserve concept and ideals in the Clayoquot Sound region's temperate zone rain forest ecosystems and coastal marine areas to applications in Barkley Sound's major coastal marine ecosystem with some forested rivers flowing into it. Both could exemplify effective co-management regimes for biosphere reserves with an emphasis on Nuu-chah-nulth traditions and aspirations, local conservation economy enterprises for reliable prosperity, and the preservation and enhancement of biodiversity and ecosystem services.

4. The **CBT** intends, appropriately, to pro-actively renew efforts to build local networks and collaborative nodes among agencies and other organizations while also respecting the continuing need for co-management capacity building in the biosphere reserve. In keeping with the work of **CLARET**, pursuing a forum function for discussing issues supported by trustworthy information (rather like the local Advisory Committees do, only on a larger scale and with focused facilitation) would be an important and locally-supported role in line with the 'learning platform' function of biosphere reserves. This, in turn, raises questions about using technology and increasing the visibility, relevance and presence of the **CBT** in each community. Questions of how best to develop the website to place more emphasis on the biosphere reserve (as **CBT** intends to do) and the role for the proposed biosphere centre need to be addressed. Other biosphere reserves in Canada are engaged with these kinds of questions. Responses go beyond the traditional "bricks and mortar" questions about physical space and facilities to issues about computerized networks of distributed databases, and protocols for using modern information and communications technologies (including Web 2.0, collaborative geomatics and social marketing tools). Pursuing a forum function raises questions about various ways that **CBT** may develop a more regular and visible presence in each of the seven communities. As the survey-monkey results and interviews indicate, it would be desirable for the **CBT** to lead locally-relevant and culturally-appropriate processes of citizen

engagement and provide forums for discussion. Issues to consider could include what the biosphere reserve designation means in the region, CBT's priorities and activities, partnership opportunities with organizations within the region, how to connect local projects to networks and initiatives beyond the region, and how to work towards enhanced sustainability.

5. As noted informally during the field visit, there is an opportunity to explore constructive links between some educational programs being developed by organizations in the biosphere reserve and the **UN Decade for Education for Sustainable Development (UNDESD)**, 2005-2014. In January 2010, a **Regional Centre of Expertise for Education on Sustainable Development** was designated (by the **UN University** on behalf of the UNDESD) at the Faculty of Education, **Simon Fraser University**, for the British Columbia (North Cascadia) region. With biosphere reserves viewed by UNESCO to be places where people are learning how to do sustainability under the particular circumstances they are in, such links can provide the necessary contextualization for effective learning based on the principles endorsed by **UNDESD** and **UNESCO**. What might be useful at the outset is to engage the **CBT's** Education Advisory Committee as leads and to gauge the interest of local educational institutes and organizations. Links to the **UNESCO Associated Schools Project Network (ASPnet)** might also be considered. These in turn could help re-enforce one of **CBT's** core priorities*, Connecting People with Place*, and especially the *Biosphere Youth Council* initiative that the **CBT** hopes to launch as a national, and in due course, an international model.

Reviewed by:

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Maureen Reed, Professor, School of Environment and Sustainability, and Department of Geography and Planning, University of Saskatchewan

On-site assistance provided by Colleen George, PhD candidate, Department of Geography, University of Saskatchewan is gratefully acknowledged.

Reference Materials Drawn Upon for the Periodic Review

Note on Internet Sources: Much of the information of interest for this periodic review was available on the Internet from websites related to organizations, programs, and issues identified in the report. Some were accessed a number of times and altogether they were too numerous to record. All of them are subject to changes, non-functional links, and closure or abandonment without notice so that any list would soon become quite out-dated. Information was also gleaned from on-line news sources such as the ***Alberni Valley Times*** *(*weekly), ***The Westerly*** (West Coast weekly), ***Westcoaster*** (Alberni-Clayoquot weekly), and ***Ha–Shilth-Sa*** (Nuu-chah-nulth bimonthly news).

A particularly informative research and document base for the Clayoquot Sound Biosphere Reserve was compiled by the **Clayoquot Alliance for Research, Education, and Training (CLARET)** in 2001-2004; it is still accessible via the **University of Victoria.**

Clayoquot Biosphere Trust

In addition to website items and files read or scanned during the visit and discussions with staff in Tofino, the main reference documents drawn upon were:

Funding Agreement between the (federal) Minister of the Environment and the Clayoquot Biosphere Trust Society, May 5, 2000.

Board Governance and Policy Statements, Approved 20 June 2000, and up-dated at various times through to 11 June 2008.

Clayoquot Alliance for Research, Education and Training (CLARET). 2003. Summary of the Clayoquot Symposium 2003. Tin Wis Resort, November 25-28. Supported by the Clayoquot Biosphere Trust, The West Coast Learning Network, Westcoast Women's Resource Society, Nuu-chah-nulthaht/West Coast Aquatic Management Society, and volunteers. Online: www.clayoquotalliance.uvic.ca/Symposium2003/Summaries_Final.pdf.

Clayoquot Sound UNESCO Biosphere Reserve: Mandate, Mission & Vision; Strategy Goals & Objectives; Board and Staff; List of Regional Background Documents; Core Priorities; **CBT** Advisory Committees (as of 2009).

CBT Business Plans for 2007-2009 & 2009-2011.

CBT Funded Project Archive (list of projects funded, 2002-2010).

Analysis of the Clayoquot Biosphere Trust Core Priorities. Report from Sharmalene Mendis-Millard to the CBT. July 11, 2008.

Background documents, CBT Annual General Meeting, Tofino, May 14, 2010:

- GENUS Capital Management. Vancouver. Clayoquot Biosphere Trust Society. First Quarter 2010.
- Auditor's Report. Mollon Tyle-Mollon Chartered Accountants. Port Alberni, May 5, 2010.
- Executive Director's Annual Report on Operations, 2009.
- Executive Director's Report, May 6, 2010.
- Minutes of the Annual General Meeting, **Tofino**, June 4, 2009.

Treaty Processes with First Nations

Understanding the B.C. Treaty Process: An Opportunity for Dialogue. Prepared for The First Nations Education Steering Committee, The B.C. Teachers Federation, and The Tripartite Public Education Committee. Second edition, February 1998.

Daniel Arbour, Brenda Kuecks & Danielle Edwards. Nuu-chah-nulth Central Region First Nations Governance Structures, 2007-2008. Ecotrust Canada 2008.

Nuu-chah-nulth Framework Agreement. February 21, 1996.

Nuu-chah-nulth, Canada and B.C. Initial Agreement-in-Principle. March 10, 2001.

Backgrounder: Maa-Nulth First Nations Agreement-in-Principle. Indian and Northern Affairs Canada, October 2003.

Incremental Treaty Agreement signed by Tla-o-qui-aht FN and B.C., November 2008.

Discussion Paper on Instructions for Implementing the New Relationships. Confidential – without prejudice. B.C. government, 2/19/2009.

Summary reports of the B.C. Supreme Court decision about aboriginal rights to fish and sell fish on the west coast of Vancouver Island, November 2009.

Maa-Nulth First Nations Final Agreement, Backgrounder. Office of the Premier, Indian and Northern Affairs Canada, Maa-nulth First Nations. December 9, 2009.

Maa-Nulth First Nations. A Foundation for Our Future Generations. Powerpoint presentation on the final agreement, prepared for effective date (est. 2009-2010).

Statement from Ahousaht and Hesquiaht First Nations reasserting the roles of Hereditary Chiefs and self-governance over traditional territories, January 2009.

Nuu-chah-nulth Agreement-in-Principle, 2001 – 11 reasons why Tla-o-qui-aht rejected the AIP & what progress, if any have we made so far? *Inside Tla-o-qui-aht,* Volume 11, Issue 4, December 2009.

United Nations Declaration on the Rights of Indigenous Peoples Adopted by the General Assembly Resolution 61/295 on 13 September 2007.

Other (in alphabetical order)

ARA Consulting Group (division of KPMG Consulting) and Peter Williams, Simon Fraser University. 2000. *Clayoquot Sound / Central Region Tourism Opportunities Study: A Process Towards Tourism Development.* Final Report for the B.C. Ministry of Small Business, Tourism & Culture, Ma-Mook Development Corporation, Aboriginal Business Canada, Nuu-chah-nulth Development Corporation.

Bamfield Marine Sciences Centre. *The First Barkley Sound Knowledge Symposium. Program and extended Abstracts*. 9-11 February 2010.

Barbara Beasley and Dawn Foxcroft. 2008. Species at Risk Within Nuu-chah-nulth Territories. Compiled for Uu-a-thluk Council of Ha'wiih and Nuu-chah-nulth Nations.

Canadian Forest Service - Forest Communities Program. *Clayoquot Forest Communities Program Strategic Plan, 2007-2013*. Submitted by Nuu-chah-nulth Central Region Management Board & Ecotrust Canada. March 2008.

Clayoquot Biosphere and Sustainability: A Workshop to Explore Measurements of Community Health. *Summary Report for the LIRN Workshops in the Clayoquot Biosphere Region,* March 27th and 28th, 2007. Presented by the partners of Learning Initiatives for Rural and Northern B.C. (LIRN), Clayoquot Biosphere Trust (CBT) and B.C. Healthy Communities.

Clayoquot Forest Communities Program. *Annual Work Plan 2010/2011*. Submitted to Canadian Forest Service, Pacific Forestry Centre, Victoria B.C. March 2010.

Clayoquot Socioeconomic Report. 2009. Curtis Cook, Laura Bonenfant, Daniel Arbour. Clayoquot Biosphere Trust, Ecotrust Canada, Clayoquot Forest Communities Program.

Clayoquot Sound Biosphere Region Community Food Survey. Presented by the Ucluelet Community Food Initiative. Funded by the Clayoquot Biosphere Trust and the Vancouver Island Health Authority. May 2009.

Clayoquot Sound Central Region Board. *Annual Report 2007-2008 & Strategic Plan, 2008-2013.* Presented to the Parties of the Interim Measures Extension Agreement as Required Under IMEA 15 (E). March 2008.

Clayoquot Sound Technical Planning Committee. *Watershed Planning in Clayoquot Sound. Volume 6: Kennedy Lake Watershed Plan*. Draft, March 2005.

Climate Change in Clayoquot. Ahousaht, Hesquiaht and Tla-o-qui-aht Community-based Climate Change Adaptation. Phase 1. Draft report. March 2010.

Coast Information Team. *Policy and Institutional Analysis for Implementation of the Ecosystem Based Management Framework.* 4.1 Case study of Clayoquot Sound; Appendix II. Implementing EBM in Clayoquot Sound – process and lessons learned.

Directory of Community Organizations in Clayoquot Sound UNESCO Biosphere Reserve Region. Clayoquot Biosphere Trust. February 2006.

Ecotrust Briefing/forest communities program. Issue 3, 2008.

Ecotrust Canada. *Alki yaka alta yukwa – the future it be now.* (Overview of Ecotrust programs), n.d. c 2005.

Fisheries and Oceans Canada. 2005*. A Discussion Paper on the Implementation of Pacific Fisheries Reform.*

Iisaak. *Wood with Respect*. 2007 Report.

Iisaak Forest Stewardship Plan, 2009 Rationale Document. Iisaak Forest Resources Ltd. Tree Farm License #57,Timber License T0840, and Timber License T0846.

Integrated Coastal Planning: What we are doing and how it all fits together. Westcoast Aquatic and Tsawalk – the power of one. The 1st Barkley Sound Research Symposium, February 2010.

Mendis, S. 2004. *Assessing Community Capacity for Ecosystem Management: Clayoquot Sound and Redberry Lake Biosphere Reserves.* Unpublished Master's thesis. Saskatoon, SK: University of Saskatchewan.

Mychajlowycz, Maryjka. *Overview of Logging in Clayoquot Sound.* Friends of Clayoquot Sound. Report for the Terrestrial Committee, CBT. November 2009.

Natural Resources Canada. 2002. *Long Beach Model Forest – Phase II Evaluation Report.* Audit and Evaluation Branch.

Pacific Rim National Park Reserve of Canada. 2008. *State of the Park Report*. Parks Canada.

Pinkerton, Evelyn, Anita Bedo and Arthur Hanson. 2005. *Final Evaluation Report: West Coast Vancouver Island Aquatic Management Board (AMB*). Simon Fraser University.

Rainforest Communications. 2003. *Community Needs Assessment.* Report Prepared for the Westcoast Women's Resources Society.

Weinstein, Marty, Sean LeRoy and Rod Dobell. 2003. *Aboriginal and Treaty Rights, and Subsistence Fisheries. Workshop Backgrounder,* 2003 National Conference. Ocean Management Research Network.

West Coast Aquatic (formerly WCVIAMB). *Coastal Prosperity and Health: A Five Year Plan (2007-2012).*

West Coast Community Survey. McAllister Opinion Research. Topline Report Appendix 1. Ecotrust, March 2009.

Wickaninnish Interpretive Centre Exhibit Redesign – Update. Powerpoint slides. Parks Canada. 2010.

List of Appendices for the Periodic Review Report for the Clayoquot Sound Biosphere Reserve August 2010

1. Information for the MABnet Directory of Biosphere Reserves

2. List of Projects Funded by the Clayoquot Biosphere Trust, 2002-2010

3. Research and Scholarship Related to the Clayoquot Sound Biosphere Reserve

4. “Civil Society”/Non Governmental Organizations in the Clayoquot Sound Biosphere Reserve Region

APPENDIX 1

Information for the MABnet Directory of Biosphere Reserves

(Adapted from the Annex to the Biosphere Reserve Nomination Form, Feb. 2004)

Administrative details

Country:	CANADA
Name of BR:	Clayoquot Sound Biosphere Reserve
Year designated:	2000
Administrative authorities:	Clayoquot Biosphere Trust Society
Name contact:	Curtis Cook
Contact address:	Clayoquot Biosphere Trust P.O. Box 67 Tofino, British Columbia Canada. V0R 2Z0
Related Links:	curtis.cook@clayoquotbiosphere.org http://www.clayoquotbiosphere.org

Description

General description (site characteristics, human population, management units); approximately 25 lines.

Clayoquot Sound is an array of islands, fjords, narrows, estuaries, mudflats, rocky shores, sand beaches, mountains, forests, lakes and streams. It is one of five Sounds on the Pacific Ocean coast of Vancouver Island, British Columbia. Most of the terrestrial vegetation is associated with the Coastal Western Hemlock (*Tsuga heterophylla*) Temperate Rainforest. The biosphere reserve includes several of the last remaining intact temperate zone rainforest watersheds in North America. The area also has a rich cultural history and a rich biodiversity.

The permanent population is about 5,000 people. At least one-third of them are Nuu-chah-nulth First Nations (of Aboriginal ancestry) whose traditional territories include all of the biosphere reserve. The UNESCO designation acknowledges their rights and title and does not prejudice ongoing Treaty negotiations between the First Nations and the

Canadian provincial and federal governments. The Clayoquot Biosphere Trust is a co-management arrangement as are other governing bodies, and subject to change following successful Treaty negotiations.

Since 2000, the local economy continues to move away from its former heavy dependency on industrial forestry and fisheries towards a more ecologically sensitive utilization informed by Nuu-chah-nulth cultural principles, and "conservation economy" small-scale alternatives. Aquaculture is also well established. Tourism and related services have grown rapidly along the coast, both in and between two towns that are accessible from the only road into the biosphere reserve. Seasonal visitors are in the order of one million annually.

Major ecosystem type:	Temperate rainforests including marine and coastal components.
Major habitats and land cover types:	Coastal Western Hemlock (~85%); Mountain Hemlock (~12%); Marine
Coastal:	
Location:	49°00' to 49°35'N and 125°25' to 126°35'W
Total area (ha):	349,947 (with possibility of some expansion)
Core areas:	110,288 (of which terrestrial = 90,184 ha)
Buffer zone:	60,409 (of which terrestrial = 58,309 ha)
Transition area:	179,250 (of which terrestrial = 116,557 ha)
Different existing zonation:	Implicit in NCN Tribal Park designations
Altitudinal range:	From – 55 to +1,804 m

Research and monitoring

Brief description (approximately 5 lines)

There are at least 22 organizations (13 based in the biosphere reserve) that are engaged in research, monitoring, demonstration projects, education and training in Clayoquot Sound on topics consistent with the biosphere reserve ideals. Much of this work is

directed to ecology and biophysical studies (biotic and abiotic) and to socio-economic and cultural studies. There is an extensive literature about "governance" in the biosphere reserve region that is based on interpretations of political events in the region over the past 30 years, and on the evolving empowered co-management form of institutions being developed with the First Nations.

Specific variables

(Please fill in the table and check relevant parameters.)

Abiotic		**Biodiversity**	
Abiotic factors	X	Afforestation/reforestation	X
Acidic deposition		Algae	X
Air quality		Alien and/or invasive species	
Air temperature	X	Amphibians	X
Climate. climatology	X	Arid & semi-arid systems	
Contaminants		Autoecology	
Drought		Beach/soft bottom systems	X
Erosion	X	Benthos	X
Geology	X	Biodiversity aspects	X
Geomorphology	X	Biogeography	X
Geophysics	X	Biology	X
Glaciology		Biotechnology	
Global change		Birds	X
Groundwater		Boreal forest ecosystems	X
Habitat issues	X	Breeding	
Heavy metals		Coastal/marine ecosystems	X
Hydrology	X	Community studies	X
Indicators		Conservation	X
Meteorology	X	Coral reefs	
Modeling	X	Degraded areas	X
Monitoring/methodologies	X	Desertification	
Nutrients		Dune systems	
Physical oceanography	X	Ecology	X
Pollution, pollutants		Ecosystem assessment	X
Siltation/sedimentation	X	Ecosystem functioning/structure	X
Soil	X	Ecotones	X
Speleology		Endemic species	X
Topography	X	Ethology	
Toxicology		Evapotranspiration	X
UV radiation		Evolutionary studies/palaeoecology	X
		Fauna	X
		Fires/fire ecology	
		Fishes	X
		Flora	X
		Forest systems	X

Abiotic (continued)

Biodiversity (continued)

Freshwater systems	X
Fungi	X
Genetic resources	
Genetically modified organisms	
Home gardens	X
Indicators	X
Island systems/studies	
Lagoon systems	
Lichens	X
Mammals	X
Mangrove swamps	
Mediterranean type systems	
Microorganisms	X
Migrating populations	X
Modeling	X
Monitoring/methodologies	X
Mountain and highland systems	X
Natural and other resources	
Natural medicinal products	X
Perturbations and resilience	
Pests/diseases	
Phenology	
Phytosociology/succession	X
Plankton	X
Plants	X
Polar systems	
Pollination	
Population genetics/dynamics	X
Productivity	
Rare/endangered species	X
Reptiles	
Restoration/rehabilitation	X
Species (re) introduction	
Species inventorying	X
Sub-tropical & temperate rainforest	
Taxonomy	X
Temperate forest systems	X
Temperate grassland systems	
Tropical dry forest systems	
Tropical savannah systems	
Tropical humid forests systems	
Tundra systems	
Vegetation studies	X
Volcanic/geothermal systems	X
Wetland systems	X
Wildlife	X

Socio-economic	
Agriculture production systems	
Agroforestry	
Anthropological studies	X
Aquaculture	X
Archaeology	X
Bioprospecting	
Capacity building	X
Cottage(home-based) industry	X
Cultural aspects	X
Demography	X
Economic studies	X
Economical important species	X
Energy production systems	X
Ethnology/TEK	X
Firewood cutting	
Fishery	X
Forestry	X
Human health	X
Human migration	
Hunting	X
Indicators	X
Indicators of sustainability	X
Indigenous people's issues	X
Industry	
Livelihood measures	X
Livestock & related impacts	
Local participation	X
Micro-credits	X
Mining	X
Modeling	X
Monitoring/methodologies	X
Natural hazards	
Non-timber forest products	X
Pastoralism	
People-Nature relations	X
Poverty	X
Quality economies/marketing	X
Recreation	X
Resource use	X
Role of women	X
Sacred sites	X
Small business initiatives	X
Social/socio-economic aspects	X
Stakeholders' interests	X
Tourism	X
Transports	X

Integrated monitoring	
Biogeochemical studies	
Carrying capacity	
Conflict analysis/resolution	X
Ecosystem approach	X
Education & public awareness	X
Environmental changes	X
Geographic information systems	X
Impact and risk studies	
Indicators	X
Indicators of environmental quality	X
Infrastructure development	
Institutional & legal aspects	
Integrated studies	
Interdisciplinary studies	X
Land tenure	X
Land use/cover	X
Landscape inventory/monitoring	
Management issues	X
Mapping	X
Modeling	X
Monitoring/methodologies	X
Planning and zoning measures	
Policy issues	X
Remote sensing	X
Rural systems	
Sustainable development/use	
Transboundary issues/measures	X
Urban systems	
Watershed studies/monitoring	X

APPENDIX 2

List of Projects Funded by the Clayoquot Biosphere Trust, 2002-2010

Prepared by Jessie Fletcher, Development Officer, CBT

Year	Project	Proponent	Amount
2002	Clayoquot Biosphere Regional Initiative	Raincoast Education Society	$8,199
2002	Nuu-chah-nulth Language Program	Central Region Nuu-chah-nulth Language Society (CRNLS)	$9,800
2002	Return of the Salmon Festival	Central Westcoast Forest Society (CWFS)	$9,000
2002	Regional Recycling Initiative	Rainforest Regional Recycling Society	$9,001
2002	Green Economic Opportunities Study	Friends of Clayoquot Sound	$9,000
2002	Goosebarnacle Harvest	Aquatic Management Board (AMB)	$5,000
2002	National Aboriginal Days	Pacific Rim National Park Reserve (PRNPR)	$901
2002	Scholarships		$11,000
2003	First Nation Liason and Participation in Community Events	CWFS	$8750
2003	Language Teacher Training	CRNLS	$5,000
2003	An Arts Festival Approach to Cross-Cultural Understanding	Pacific Rim Arts Society	$10,000
2003	Community Needs Assessment	Westcoast Community Resources Society (WCRS)	$10,000
2003	Lemmens Inlet Shellfish Carrying Capacity Study	Tribal Council	$10,000
2003	Kelp Inventory	AMB	$5,000
2003	Eelgrass Inventory	Strawberry Isle Marine Research Society (SIMRS)	$5,000
2003	Scholarships		$9,000
2004	Grief and Loss Program	Pacific Rim Hospice Society (PRHS)	$5,000
2004	Small Stream Recovery	CWFS	$9,900

2004	Community Structure for Shellfish Plant	Ecotrust	$10,000
2004	Biodiesel Collective	Tofino Long Beach Chamber of Commerce	$7,500
2004	Life Skills and Leadership Program	WCS	$9,500
2004	Cultural Awareness through Arts	PRAS	$9,000
2004	Mudflats Monitoring Program	Caron Olive (Contract)	$11,000
2004	Scholarships		$11,000
2002-4	CLARET		$93,571
2005	Expansion of Ahousaht Youth Centre Library	Ahousaht Cultural Centre Society	$1,451
2005	Delivery of 'Kindness Injection'	PRHS	$1,210
2005	Nism'a Training	Nism'a	$8,000
2005	Nuu-chah-nulth Young Naturalist Program	RES	$3,452
2005	Youth Advocate	WCRS	$31,000
2005	Expansion of the Community Action Lifeskills and Leadership Program	WCS and TFN	$5,000
2005	Scholarship		$11,000
2006	Youth and the Biosphere Program	Tofino Botanical Gardens Foundation (TBGF)	$4,150
2006	Outdoor Leadership Program	USS	$5,425
2006	Young Naturalist Program	RES	$10,000
2006	Intertidal Education Materials	UAS, PRNPR, RES	$5,000
2006	CALL Program	WCSC	$7,000
2006	Outdoor Recreation and Sports Tourism	Ucluelet Chamber of Commerce	$2,000
2006	Baseline Economic Data and Indicators	Tofino Business Association (TBA)	$5,000
2006	Fish Mort and Offal to Biofuel Feasibility Study	Environmental Youth Alliance	$7,225
2006	FN Cultural Digitizing Project	Hesquiaht First Nation	$5,000
2006	Nuu-chah-nulth Language Centre	Central Region Nuu-chah-nulth Language Group	$6,000

2006	Nism'a Project – Outdoor Education for Youth	Nism'a Project Society	$8,000
2006	Bear Aware	West Coast Bear Aware Committee	$3,000
2006	Canopy Study – Aboreal Biodiversity Across Spacial Scales	UVIC Biology Department	$8,000
2006	Clayoquot Sound Wolf Study	First Nations Environmental Network	$8,000
2006	Stellar Sea Lions	PRNPR	$8,000
2006	Community Participation in Whale Studies	Pacific Wildlife Foundation	$8,500
2006	Grief Support in Ittatsoo	PRHS	$1,800
2006	Disaster Relief Training	Ucluelet Disaster Relief Society	$3,300
2006	Coastal Health Care Committee	Tofino General Hospital Foundation	$4,900
2006	Portrait of Ahousaht film Project	USS	$1,800
2006	Summer Arts Festival	PRAS	$1,700
2006	Ahousaht Root Garden	RES	$2,500
2006	Training Volunteers and Service Providers	PRHS	$2,500
2006	Geography 453	UVIC	$3,000
2006	Atlantic Salmon Study	First Nations Environmental Network	$2,000
2006	Streamkeepers Education Materials	Tofino Streamkeepers Society	$2,800
2006	Signage for the Wild Pacific Trail	West coast Bear Aware Committee	$2,000
2006	Scholarships		$11,000
2006	Event Funding		$5,000
2007	Outdoor Leadership Program	USS	$5,425
2007	Nuu-chah-nulth Language Centre (mutli-year)	Central Region Nuu-chah-nulth Language Group	$6,000
2007	Nism'a Project – Outdoor Education for Youth (mutli-year)	Nism'a Project Society	$8,000
2007	Canopy Study – Aboreal Biodiversity Across Spacial Scales (mutli-year)	UVIC Biology Department	$8,000
2007	Stellar Sea Lions (mutli-year)	PRNPR	$8,000
2007	Community Participation in Whale Studies (mutli-year)	Pacific Wildlife Foundation	$8,500
2007	West Coast Recreation Centre Business Plan	Long Beach Recreation Society	$6,000

2007	West Coast Trades and Apprenticeship Program	School District 70	$6,000
2007	Youth Activity Worker: Cultural, Education and Recreation	Ahousaht Cultural Youth Centre	$4,000
2007	Young Naturalists Program	RES	$4,000
2007	Sustainability Camp	TBGF	$4,000
2007	Tla-o-qui-aht Language and Knowledge Mutli-media Project	TFN	$6,500
2007	Living our Ahousaht Language	Ahousaht Cultural Youth Centre	$1,815
2007	Ahousaht Clean Harbour Project	Make it Happen	$2,069
2007	Integrating Fisheries into the Local Elementary School Curriculum	Hesquiaht First Nation Fisheries	$4,091
2007	Wetland Surveys for Breeding Amphibians	Wetland Stewards of the Clayoquot Sound Region	$5,110
2007	Carnivore Diet – WildCoast Project	PRNPR	$3,500
2007	Wild Pacific Trail Interpretive Signs	Wild Pacific Trail Society	$3,000
2007	Celebration of Health	Ucluelet First Nation	$1,000
2007	Reaching IN- Reaching OUT	PRHS	$2,500
2007	HERA Project	Tonquin Society	$1,363
2007	First Nations Component of 2007 Arts Festival	PRAS	$2,000
2007	Celebration of Health	Ucluelet First Nation	$2,000
2007	Living Ahousaht Language	Ahousaht Youth Cultural Centre	$6,000
2007	Impacts of Recreation on the Tofino Mudflats	RES	$2,400
2007	Communication Materials	SIMRS	$2,050
2007	Geography 453	UVIC	$3,000
2007	Geogarphy 490: Ahousaht Field Work	UVIC	$3,000
2007	Orthographic Photos	CBT Terrestrial Committee	$5,000
2007	Events Funding		$5,000
2007	Scholarships		$11,000
2008	Outdoor Leadership Program (multi-year)	USS	$5,425
2008	CALL Program (multi-year)	WCS	$7,000
2008	Nism'a Project (multi-year)	Nism'a Society	$8,000
2008	Canopy Study (multi-year)	UVIC	$8,000
2008	Stellar Sea Lions (multi-year)	PRNPR	$8,000
2008	Community Participation in Whale	Pacific Wildlife Foundation	$8,500

	Studies (multi-year)		
2008	Coastal Erosion and Climate Change Impacts Monitoring Program	UVIC	$4,320
2008	Community Feasting Project	Uu-a-thluk	$2,500
2008	First Nations Photography Club	Make it Happen	$2,500
2008	Fish, Human and Ecosystem Health: Assessment and Education Plan	UAS	$4,000
2008	Hospice Training 2009	PRHS	$2,500
2008	Lost Shoe Trail Restoration	CWFS	$3,250
2008	Morpheus Island Remediation and Interpretation Project	Tonquin Foundation	$7,300
2008	Primary Playground Replacement	UES PAC	$4,000
2008	Seniors Care: Extended Care, Intermediate Care & Assisted Living for Seniors	Pacific Rim Communities Seniors Care Society	$4,000
2008	Roots of Empathy	WCRS	$5,400
2008	Raincoast Sustainable Living	RES	$3,750
2008	Sharing Nuu-chah-nulth Culture	UES	$5,300
2008	St Columba Centennial History Project	St Columba Anglican Church Women	$2,000
2008	Streamkeepers Website	Tofino Streamkeepers	$2,000
2008	Sustainability Camp 2009	TBGF	$3,000
2008	Trail Head Map Signs with Interpretive Component	Wild Pacific Trail Society	$3,350
2008	USS Totem Project	USS	$2,000
2008	Wetland Surveys for Breeding Amphibians	Wetland Stewards of the Clayoquot Biosphere Region	$3,500
2008	Wolf and Cougar Studies in Clayoquot Sound	SIMRS	$5,620
2008	Sports Teams Scholarships		$4,000
2008	Opera Benefit		$2,500
2008	Event Sponsorship		$5,000
2008	Tofino Film Festival		$2,000
2008	Rockfish Tank	UAS	$500
2008	Scholarships		$11,000

2009	Coping with Grief Engaging Communities	PRHS	$2,500
2009	Truth about Fundraising Seminars	WCRS	$4,375
2009	Building Capacity for Disaster Resilience	Ucluelet Disaster Relief Society	$3,200
2009	Morpheus Island and Historical Interests Dinner	Tonquin Society	$3,137
2009	Whale Festival Cedar Weaving Workshop	Pacific Rim Whale Festival Society	$1,535
2009	Archival Supplies and Materials	Ucluelet and Area Historical Society	$1,500
2009	Sharing the Grandparents Teachings	Uu-a-thluk – NTC	$3,000
2009	Ha-wiih Governance Workshop	Central Region First Nations Holding Society	$4,000
2009	Young Naturalists Program	RES	$4,000
2009	Sustainability Camp	TBGF	$4,000
2009	Youth Activity Worker	Ahousaht Cultural Youth Centre	$4,000
2009	Grade 5 Field Trip	WCS	$1,000
2009	Aquarium Education Program	UAS	$1,800
2009	Crab Monitoring in the Ucluelet Harbour	Ucluelet First Nations	$3,150
2009	Salmon Report Printing	First Nations Environmental Network	$494
2009	Hatchery Tour Honoraria	Tofino Salmon Enhancement Society	$200
2009	Bedwell River Salmon Enhancement	Thornton Creek Enhancement Society	$8,000
2009	Streamkeeper Course	Hesquiaht Fisheries	$406
2009	Forestry Forum	CBT Terrestrial Committee	$1,438
2009	Scope of Change: New Forest Managers, New Management Ideas in Clayoquot Sound	FOCS	$5,000
2009	Sydney Inlet Field Course	Bamfield Marine Sciences Centre	$2,200
2009	Education Committee Elementary School Field Strip Support	Education Committee	$5,000
2009	AFN dancers to Calgary	AFN	$500
2009	Cool Cooks	District of Tofino	$2,250
2009	Existing GIS data in Tofino	Caron Olive	$875
2009	Cedar Weaving Workshop	Whale Fest	$1,535
2009	Wild Coast Communications	PRNPR	$2,500

2009	Organic Master Gardener Course	Ucluelet Community Food Initiative	$1,472
2009	Community Garden Survey	Tofino Community Food Initiative	$2,000
2009	Tofino Film Festival		$2,000
2009	Challenging Cultures of Violence	WCRS	$2,500
2009	Salt Water Aquarium	WCS	$755
2009	Conserving Aquarium Populations	UAS	$6,000
2009	Marine Mammal Studies	Cetus Research	$1,2000
2009	Bedwell River Enhancement	Bedwell River Enhancement Society	$4,029.67
2009	Festival Funding		$5,000
2009	Scholarships		$11,000
2010	2010 Tofino International Indigenous Film Festival	Tofino Film Festival Society	$3,000
2010	Cedar Harvest and Weaving: Elder and Youth Mentoring	Ittatsoo Learning Centre	$2,000
2010	Nuu-chah-nulth Reiki Project	Tla-o-qui-aht First Nations	$3,000
2010	Launch of a West Coast Carving Festival – Carving on the Edge	Pacific Rim Arts Society	$2,000
2010	Raincoast Sustainable Living Podcasts	Raincoast Education Society	$5,000
2010	Community Participation in the 12th International Congress of Ethnobiology	Tofino Botanical Gardens	$3,000
2010	After-school Club	District of Tofino – Parks & Rec department	$2,000
2010	There's a Sea Lion on my Line	Vancouver Aquarium	$4,584
2010	Bedwell River Chinook Recovery Plan	Thornton Creek Enhancement Society	$2,000
2010	Searching for Sustainable Local Foods: A Study of the Heavy Metal Toxicity of Ucluelet Harbour Clams	Ucluelet First Nations	$3,416
2010	Wolf and Cougar Studies in Clayoquot Sound: Involving Communities and Using Local Knowledge to understand Coastal Carnivore Ecology	Strawberry Isle Marine Research Society	$7,000
2010	Training DVD for the Bear Smart Community Program	BearSmart BC Society	$3,000

2010	Extended Care, Intermediate Care, Assisted Living for Seniors	Pacific Rim Communities Seniors Care Society	$2,000
2010	Community Gardens	Health R Us	$2,350
2010	West Coast Youth Consultation and Integration Initiative	Coastal Family Resource Coalition	$8,000
2010	Tofino Community School Garden	Tofino Community Food Initiative	$7,650
2010	Cedar Weaving Workshops	Pacific Rim Whale Festival Society	$1,535
2010	Demential Education Workshop	Pacific Rim Hospice Society	$900
2010	Centennial & Tonquin Creek Survey	Central Westcoast Forest Society	$3,188
2010	Traditional Foods Tool Kit Demonstration	Uu-a-thluk	$1,800
2010	Adventures with Killer Whales update	Strawberry Isle Marine Research Society	$1,000
2010	Michael Ableman Lecture	Raincoast Education Society	$1,500
2010	Festival Funding		$5,000
2010	Phase 2, Hesquiaht Food Project	CBT	$20,000 (pending)

APPENDIX 3: Research and Scholarship Related to the Clayoquot Sound Biosphere Reserve

The following publications indicate the wide range of research and scholarly interests that have been attracted to the biosphere reserve region, most within the last 10-15 years or so. They are reported in a widely scattered range of academic and other research publications, so the items listed here are best considered illustrative of the range of interests, rather than some thorough or exhaustive compilation of them. The first set of Governance Related Papers are mainly reflective and interpretive accounts of the contexts in which resource disputes, political responses and policy issues arose and were dealt with by different players over the years. The second and third compilations under Ecology and Biophysical Studies, and Socio-economic and Cultural Studies respectively, address a range of quite specific topics relevant to phenomena in Clayoquot Sound.

Governance Related Papers

Arvai, Joseph L., and Michael J. Mascarenhas. 2001. Print Media Framing of the Environmental Movement in a Canadian Forestry Debate. *Environmental Management*, 27(5); 705-714.

Atleo, E. Richard – (Ummek). 2004. *Tsawalk: A Nuu-chah-nulth Worldview*. Vancouver: University of British Columbia Press.

Berman, S.F. Tzeporah. 1995. *Standing for Our Lives: A Feminist Journey to Clayoquot Sound*. Masters of Environmental Studies Thesis, York University.

Bernstein, Steven, and Benjamin Cashore. 2000. Globalizations, Four Paths of Internationalization and Domestic Policy Change: The Case of EcoForestry in British Columbia, Canada. *Canadian Journal of Political Science*, XXXIII(1): 67-99.

Boucher, Priscilla Mae. 1998. *Ecology, feminism, and planning: Lessons from women's environmental activism in Clayoquot Sound*. PhD Thesis, University of British Columbia.

Bunton, Martin. 2004. *Natural resource management and property rights: getting the institutions right*. Clayoquot Alliance Working Paper. (32 pp. typescript).

Burrows, Mae. 2001. Multistakeholder Processes: Activist Containment versus Grassroots Mobilization, Ch. 9 (pp. 209-228) in: Debra J. Salazar and Donald K. Alper (Eds.) *Sustaining the Forests of the Pacific Coast: Forging Truces in the Woods*. University of British Columbia Press.

Chaloupka, William. 2000. Jagged Terrain: Cronin, Soulé, and the Struggle over Nature and Deconstruction in Environmental Theory. *Strategies*, 13(1): 23-38.

Coast Information Team. 2004. Clayoquot Sound Case Study. In: *Policy and Institutional Analysis for Implementation of the Ecosystem Based Management Framework*. Section 4 and Appendix II

Curran, Deborah, and Michael M'Gonigle. 1999. Aboriginal Forestry: Community Management as Opportunity and Imperative. *Osgoode Hall Law Journal*. 37(4):711-774.

Dai, Sulan, and S. Martin Taylor. 2007-2009. Socio-economic Restructuring and Health: A Qualitative Study of British Columbia Coastal Communities. [includes Tofino-Ucluelet]. *Western Geography*, 17-19: 5-38.

Dark, A. Vladimir. 1998. *Public sphere politics and community conflict over the environment and Native rights in Clayoquot Sound, British Columbia*. PhD Thesis, New York University.

Dobell, Rod. 2001. *Social Learning, Social Capital and Adaptive Management in the Clayoquot Sound UNESCO Biosphere Reserve*. Notes for comments, 4th Annual Policy Research Conference, Ottawa.

Dobell, Rod. 2002. Devolution and Discretion: Building Community-Based Resource Management into Contemporary Governance. In John Langford and Meredith Edwards (Eds.) *New Players, Partners, and Boundaries: A Public Sector Without Borders?* Canberra: National Institute for Governance.

Eden, Sally. 2001. Environmental Issues: Nature versus the environment? *Progress in Human Geography*, 25(1): 79-85.

George, Chief Earl Maquinna 2003. *Living on the Edge: Nuu-Chah-Nulth History From an Ahousaht Chief's Perspective*. Winlaw, BC:Sononis Press.

Harris, Douglas C. 2009. A Court Between: Aboriginal and Treaty Rights in the British Columbia Court of Appeal. *BC Studies*, Issue 162; 137-165.

Hoberg, George, and Edward Morawski. 1997. Policy change through sector intersection: forest and aboriginal policy in Clayoquot Sound. *Canadian Public Administration*, 40(3): 387- 414.

Hoberg, George. 1999. The Coming Revolution in Regulating Our Forests. *Policy Options*, December, pp. 53-56.

Hoberg, George. 2002. *Finding the Right Balance: Designing policies for sustainable forestry in the new era*. Jubilee Lecture. Faculty of Forestry, University of British Columbia, September 12, 2002.

Jackson, Tony, and John Curry. 2002. Regional Development and Land Use Planning in Rural British Columbia: Peace in the Woods. *Regional Studies*, 36(4): 439-443.

Kamieniecki, Sheldon. 2000. Testing Alternative Theories of Agenda Setting: Forest Policy Change in British Columbia, Canada. *Policy Studies Journal*, 28(1): 176-189.

Kepay, Mark. 2002. *Implementing adaptive forest management: the challenge of a wicked human environment*. Clayoquot Alliance Working Paper. (36 pp. typescript).

Lertzman, David A. 1999. *Planning Between Cultural Paradigms: Traditional Knowledge and the Transition to Ecological Sustainability*. PhD Thesis, University of British Columbia.

Lertzman, David A., and Harrie Vredenburg. 2005. Indigenous Peoples, Resource Extraction and Sustainable Development: An Ethical Approach. *Journal of Business Ethics*, 56: 239-254.

Mabee, Warren E., Evan D.G. Fraser, and Olav Slaymaker. 2004. Evolving Ecosystem Management in the Context of British Columbia Resource Planning. *BC Journal of Ecosystems and Managemen*t, 4(1):1-11

Magnusson, Warren, and Karena Shaw (Eds.) 2002. *A Political Space: Reading the Global through Clayoquot Sound*. Montreal & Kingston: Queen's University Press.

Mendis-Millard, Sharmalene, and Reed, Maureen G. 2007. Understanding Community Capacity Using Adaptive and Reflexive Research Practices: Lessons From Two Canadian Biosphere Reserves. *Society & Natural Resources*, 20:6, 543 – 559.

M'Gonigle, Michael. *Structural Instruments and Sustainable Forests: A Political Ecology Approach*. 1996. Discussion paper 96-3A. Eco-Research Chair of Environmental Law & Policy, University of Victoria.

de Moor, Aldo. 2004. *Strengthening Civil Society by Developing Stakeholder Communities Using Intermedia*. Paper for the Community Network Analysis Conference. Brighton, UK

Morford, Shawn, Dave Robinson, Felice Mazzoni, Cleo Corbett and Heidi Schalberger. 2004. Participatory research in rural communities in transition: A case study of the Malapsina-Ucluelet Research Alliance. *BC Journal of Ecosystems and Management*, 5(2): 40-43.

National Round Table on the Economy and the Environment (NRTEE). c. 2002? *Clayoquot Sound Biosphere Reserve*. Case Study for the NRTEE Conservation of Natural Heritage Program.

Nicol, Anne-Marie. 1996. *The Press & Environmental Issues: A Case Study of the Canadian Coverage of Clayoquot Sound*. Masters of Environmental Studies Thesis, York University.

Patel, Nandita. 2002. *Postmodern interpretations of the policy cycle*. Clayoquot Alliance Working Paper. (48 pp. typescript).

Pollock, R. Reed, M.G. and Whitelaw, G. 2008. "Steering Governance Through Regime Formation at the Landscape Scale: Evaluating Experiences in Canadian Biosphere Reserves" in Hanna, K., Clark, D., and Slocombe, S. (eds.) Transforming Parks: Protected Areas Policy and Governance in a Changing World. Routledge: London, pp. 110-133.

Pralle, Sarah B. 2003. Venue Shopping, Political Strategy, and Policy Change: The Internationalization of Canadian Forest Advocacy. *International Public Policy*, 23(3): 233-260.

Rayner, Jeremy, Michael Howlett, Jeremy Wilson, Benjamin Cashore, and George Hoberg. 2001. Privileging the sub-sector: critical sub-sectors and sectoral relationships in forest policy-making. *Forest Policy and Economics*, 2: 319-332.

Reed, Maureen G. 2000. Taking Stands: a feminist perspective on 'other' women's activism in forestry communities of northern Vancouver Island. *Gender, Place and Culture*, 7(4): 363-387.

Reed, M.G. 2003. Taking Stands: Gender and the Sustainability of Rural Communities. Vancouver, UBC Press.

Reed, Maureen G. 2007. Uneven Environmental Management: a Canadian comparative political ecology. *Environment and Planning A*, 39: 320-338.

Reed, M.G. 2007. Uneven Environmental Management: A Canadian Perspective, Environmental Management. 39:30-49.

Reed, M.G. 2009. "Environmental justice and community-based ecosystem management" in Agyeman, R.J., Cole, P., Haluza-Delay, R. and O'Riley, P. (eds.) *Speaking for Ourselves: Environmental Justice in Canada*. Vancouver: UBC Press. pp. 163-180.

Richards, Laura J., and Jean-Jacques Maguire. 1998. Recent international agreements and the precautionary approach: new directions for fisheries management science. *Canadian Journal of Fisheries and Aquatic Science*, 55: 1545-1552.

Robison, Joanna L., D.B Tindall, Erin Seldat, and Gabriela Pechlaner. 2007. Support for First Nations' Land Claims Amongst Members of the Wilderness Preservation Movement: The Potential for an Environmental Justice Movement in British Columbia. *Local Environment*, 12 (6): 579-598.

Rojas, Alexandro, Jake Grandy and Julie Jamieson. 2002. *Towards an adaptive resolution of environmental conflicts: lessons from Clayoquot Sound.* Paper for an International Conference on Adaptive Resolution of Environmental Conflicts, Liu Centre, University of British Columbia, September 25-27, 2002.

Rossiter, David. 2004. The Nature of Protest: Constructing the spaces of British Columbia's rainforests. *Cultural Geographies*, 11: 139-164.

Shaw, Karena. 2004. The Global/Local Politics of the Great Bear Rainforest. *Environmental Politics*, 13(2): 373-392.

Svendsen, Ann. 2000. Stakeholder Engagement: A Canadian Perspective. *Accountability Quarterly*, March 2001 (7 pp.)

Thom, Megan. 2005. Connections, Challenges, and Clayoquot Sound: Community-based Research in an Indigenous Context. Research paper, School of Environmental Studies, University of Victoria.

Torgerson, Douglas. 1999. Images of Place in Green Politics: The Cultural Mirror of Indigenous Traditions, in: Frank Fischer and Maarten Hajer (Eds.) *Living with Nature – Environmental Politics as Cultural Discourse.* New York: Oxford University Press.

Trosper, Ronald L. 2003. Resilience in Pre-Contact Pacific Northwest Social Ecological Systems. *Conservation Ecology*, 7(3)6. [on-line]

Turner, Nancy J., and James T. Jones. 2000. *Occupying the Land: Traditional Patterns of Land and Resource Ownership among First Peoples of British Columbia*. Paper presented to the International Association for the Study of Common Property Resources Conference, Bloomington, Indiana, May 2000.

Turner, Nancy J. c2001? *"Keeping it Living": Applications and Relevance of Traditional Plant Management in British Columbia to Sustainable Harvesting of Non-timber Forest Products [NTFP*]. NTFP Conference Proceedings, pp. 66-77.

Walter, Emily, R. Michael M'Gonigle, and Celeste McKay. 2000. Fishing Around the Law: The Pacific Salmon Management System as a "Structural Infringement" of Aboriginal Rights. *McGill Law Journal*, 45: 263-314.

Walter, Emily. 2003. From Civil Disobedience to Obedient Consumerism? Influences of Market-Based Activism and Eco-Certification on Forest Governance. *Osgoode Hall Law Journal*, 41(2&3): 531-563.

Walter, Pierre. 2007. Adult Learning in New Social Movements: Environmental Protest and the Struggle for the Clayoquot Sound Rainforest. *Adult Education Quarterly*, 57: 248-263.

Willems-Braun, Bruce. 1997. Buried Epistemologies: The Politics of Nature in (Post)colonial British Columbia. *Annals of the American Association of Geographers*, 87(1): 3-31.

Zietsma, Charlene, Monika Winn, Oana Branzei and Ilan Vertinsky. 2002. The War of the Woods: Facilitators and Impediments of Organizational Learning Processes. *British Journal of Managemen*t, 13(2S):61-74. [MacMillan Bloedel in Clayoquot Sound.]

Ecology and Biophysical Studies (Biotic and Abiotic UNESCO/MAB)

Baird, R.W., P. Stacy, K. Langerlier, and David Duffus, 2003. An evaluation of gray whale (*Eschrichtius robustus*) mortality incidental to fishing operations in British Columbia. *Journal of Cetacean Research and Management*, 4(3): 289-286.

Bass, Joanna. 2000. *Variations in Gray Whale Feeding Behaviour in the Presence of Whale-Watching Vessels in Clayoquot Sound, 1993-1995.* PhD Thesis, Department of Geography, University of Victoria.

Beasely, Barbara, and Caron Olive. 2005. *Stewardship, Mudflats and Snowshoes: Trial methods for monitoring forest vegetation along the shore of the **Tofino** Mudflats Wildlife Management Area*. Presentation to the Ecological Monitoring and Assessment Network (EMAN) National Science Meeting, Penticton.

Beasley, B.A. 2009. Wetland surveys for breeding amphibians within the Clayoquot Biosphere Reserve Region in Spring 2008-2009. Unpublished Technical Report, Association of Wetland Stewards for Clayoquot and Barkley Sounds. Ucluelet, B.C. 23 pp + appendices.

Burger, Alan E. 2000. Bird in Hot Water: Responses by Marbled Murrelets to Variable Ocean Temperatures off Southwestern Vancouver Island. *Proceedings of a Conference on the Biology and Management of Species and Habitats at Risk*. BC Ministry of Environment, Lands and Parks and University College of the Caribou, Kamloops, BC. February 1999.

Burger, AE. 2001. Using radar to estimate populations and assess habitat associations of marbled murrelets. *Journal of Wildlife Management*, 65(4): 696-715.

Burger, A.E., and T.A. Chatwin (Eds.) 2002. *Multi-scale Studies of Population, Distribution and Habitat Associations of Marbled Murrelets in Clayoquot Sound, British Columbia*. Victoria B.C. Ministry of Water, Lands and Air Protection.

Calambokidis, John (and 9 others). 2000. *Range and Movement of Seasonal Resident Gray Whales from California to Southeastern Alaska*. Cascadia Research, Olympia, Washington.

Calambokidis, John (and 9 others). 2002. Abundance, range and movements of a feeding aggregation of gray whales (*Eschrichtius robustus*) from California to southern Alaska in 1998. *Journal of Cetacean Research and Management*, 4(3): 267-276.

Calambokidis, John (and 8 others). 2003. *Gray Whale Photographic Identification in 2002: Collaborative Research in the Pacific Northwest*. Report prepared for the National Marine Mammal Laboratory, Seattle, Washington.

Carruthers, Erin H. 2000. *Habitat, population structure and energy value of benthic amphipods and implications for gray whale foraging in Clayoquot Sound, British Columbia*. MSc Thesis, Queen's University.

Chatwin, Trudy, Lindsay E. Jones, and Alan E. Burger. 1999. *Using multi-scale inventory and research to conserve Marbled Murrelets in Clayoquot Sound, British Columbia*. Presentation to the 26th Annual Meeting of the Pacific Seabird Group, Blaine, Washington, 24-28 February 1999.

Clarkson, Peter, and Yuri Zharikov. 2010. *Black Oystercatchers – Shoreline Sentinel of Barkley Sound.* Paper presented to the Barkley Sound Knowledge Symposium, February 2010.

Craig, Juliet. 1998. *Nature was the provider: traditional ecological knowledge and inventory of culturally significant plants and habitats in the Atleo watershed, Ahousaht Territory, Clayoquot Sound.* MSc Thesis, Environmental Science, University of Victoria.

Culik, Boris M., Sven Koschinski, Nick Tregonza, and Graeme M. Ellis. 2001. Reactions of harbor porpoises, *Phocoena phocoena*, and herring, *Clupea harengus*, to acoustic alarms. *Maine Ecology Series*, 211: 255-260. [Clayoquot Sound & Baltic Sea]

Darling, J.D. and K.E. Keogh. 1994. Observations of basking sharks, *Cetorhinus maximus*, in Clayoquot Sound, British Columbia. *Canadian Field Naturalist*, 108(2): 199-210.

Dearden, P. and S. Doyle. 1997. External Threats to Pacific Rim National Park, pp. 121-136 in: C. Stadel (Ed.) *Themes and Issues of Canadian Geography, II*. Salzburger Geographische Arbeiten.

Dunham, Jason. 1999. *Gray Whale Prey and Whale Distribution in Clayoquot Sound, British Columbia, Canada (1996-97).* MSc Thesis, Department of Geography, University of Victoria.

Dunham, J.S., and Duffas, D.A. 2001. Foraging patterns of gray whales in central Clayoquot Sound, British Columbia, Canada. *Marine Ecology Progress Series*, Vol. 223, pp. 299-310.

Gavin, Daniel G. 2001. Estimation of Inbuilt Age in Radiocarbon Ages of Soil Charcoal for Fire History Studies. *Radiocarbon*, 43(1): 27-44. [studies in Clayoquot Sound]

Gavin, Daniel G., Linda B. Brubaker, and Kenneth P. Lertzman. 2003. Holocene Fire History of a Coastal Temperate Rain Forest Based on Soil Charcoal Radiocarbon Dates. *Ecology*, 84(1): 186-201.

Griffiths, David W., David W. Kevin & Melissay Darby. 2004. *Preliminary Archaeological Survey and Analysis with Ethnographic Notes* [Echachist Island]. Prepared for the Tla-o-qui-aht First Nation. Tonquin Foundation.

Hamilton, Christopher. 1996. *Public Preferences for Scenic Resources in Clayoquot Sound*. Masters of Environmental Studies Thesis. York University.

Haynes, Trevor, Cliff Robinson, Pippa Sheppard, and Bob Hansen. 2004. Determining Critical Marine Foraging Habitats of the Threatened Marbled Murrelet (*Brachyramphus marmoratus*) in Pacific Rim National Park Reserve of Canada. In: T.D. Hooper (Ed.) *Proceedings of the Species at Risk 2004 Pathways to Recovery Conference.*

Hutchinson, Ian, and Alan D. McMillan. 1997. Archaeological Evidence for Village Abandonment Associated with Late Holocene Earthquakes at the Northern Cascadian Subduction Zone. *Quaternary Research*, 48: 79-87.

Jacob, M. 2000. The impact of logging on landslide activity at Clayoquot Sound, British Columbia. *Catena*, 38: 279-300.

Johannes, M.R.S., and K.D. Hyatt. 1998. The Kennedy Watershed Restoration Project: Identification of forest harvest impacts and opportunities for salmon stock and habitat rehabilitation in Clayoquot Sound, British Columbia, pp. 389-402 *Proceedings of the Forest-Fish Conference*, Calgary, Alberta.

Johannes, M.R.S., C.L.K. Robinson and K.D. Hyatt. 1999. *Kennedy Watershed Working Atlas, Volume 1: Watershed Overview. The integration of forest, salmon and water resource information to encourage sustainable resource use and development*. Northwest Ecosystem Institute, Lantzville, B.C.

Kerr, K. 2005. *Nearshore Oceanography and Planktonic Prey (Family Porcellanidae) of Gray Whales, Eschrichtius robustus, in Clayoquot Sound, British Columbia*. MSc. Thesis, Department of Geography, University of Victoria.

Kopach, B. 2004. *Fine-scale circulation as a component of gray whale (Eschrichtius robustus) habitat in Clayoquot Sound, British Columbia*. Msc Thesis. Department of Geography, University of Victoria.

Kremsater, Laurie L. and Fred L.Bunnell. 1998. Changing Forests, Shifting Values, and Chronosequence Research. *Northwest Science*, 72 (special issue 2): 9-17.

Kunze, U. 1996. *Fish rearing habitats and their natural dynamic: Study in the Clayoquot River, an undisturbed watershed in the temperate old growth rainforest on Vancouver Island, Canada, with comparative data from the Kennedy River, a disturbed watershed*. Masters Thesis, Department of Biology, Phillipps-University, Marburg, Germany.

Lertzman, Ken, Daniel Gavin, Douglas Hallett, Linda Brubaker, Dana Lepofsky, and Rolf Mathewes. 2002. Long-Term Fire Regime Estimated from Soil Charcoal in Coastal Termperate Rainforests. *Conservation Ecology*, 6(2): Art 5.

Lessard, Joanne, Josie Osborne, Ray Lausier, Glen Jamieson, and Rick Harbo. c2001. Applying local and scientific knowledge to the establishment of a sustainable fisheries: the west coast Vancouver Island goose barnacle fishery experience. *Proceedings of the Putting Fishers' Knowledge to Work Conference*, pp. 36-43.

Mabee, Holly Spiro, and George Hoberg. 2004. Protecting culturally significant areas through watershed planning in Clayoquot Sound, *The Forestry Chronicle*, 80(2): 229-240.

McFarlane, GA., Ware, DM, Thomson RE, Mackas, DL, Robinson, CLK. 1997. Physical, biological and fisheries oceanography of a large ecosystem (west coast of Vancouver Island) and implications for management. *Oceanologica Acta*, 20(1): 191-200.

McLean, Robyn. 2003. *Ecosystem-based Management in Pacific Rim National Park Reserve*. Presentation to the Science and Management of Protected Areas (SAMPA-5) Conference, Victoria.

Meier, S.K. 2003. *A multi-scale analysis of habitat use by gray whales (Eschrichtius robustus) in Clayoquot Sound, British Columbia, 1997-99*. MSc Thesis, Department of Geography, University of Victoria.

Mulkins, Lindsey, D.E. Jelinski, and J.D. Karagatzides. 2002. Carbon isotope composition of mysids at a terrestrial marine ecotone, Clayoquot Sound, British Columbia. *Estuarine, Coastal and Shelf Science*, 54(4): 669-675.

Nuwer, Jonathan M. and Richard G. Keil. 2005. Sedimentary organic matter geochemistry in Clayoquot Sound, Vancouver Island, British Columbia. *Limnology and Oceanography*, 50(4): 1119-1128.

Oronsanz, J.M., Claudia M. Hand, Ana M. Parma, Juan Valero, and Ray Hilborn. 2003. Precaution in the harvest of Methuselah's clams [Geoduck, *Panopea abrupta*] – the difficulty of getting timely feedback from slow paced dynamics. *Canadian Journal of Fisheries and Aquatic Sciences*, 61: 1355-1372.

Palm, R. 1997. *An identification guide to transient killer whales in Clayoquot Sound*. Strawberry Island Research Society, **Tofino**. (typescript)

Patterson, H.M. 2004. *Small-scale distributions and dynamics of the mysid prey of gray whales (Eschrichtius robustus) in Clayoquot Sound, British Columbia, Canada*. MSc. Thesis, Department of Geography, University of Victoria.

Pearson, Audrey F. 2000. *Natural disturbance patterns in a coastal temperate rain forest watershed, Clayoquot Sound, British Columbia*. PhD Thesis, University of Washington.

Pitt-Brooke, David. 2004. *A Wilderness Almanac – Chasing Clayoquot*. Vancouver: Raincoast Books.

Price, Karen, and Gail Hochachka. 2001. Epiphytic Lichen Abundance: Effects of Stand Age and Composition in Coastal British Columbia. *Ecological Applications*, 11(3): 904-913.

Price, Karen, Arlene Suski, Joanna McGarvie, Barbara Beasley, and John S. Richardson. 2002. Communities of aquatic insects of old-growth and clearcut coastal headwater streams of varying flow persistence. *Canadian Journal of Forest Research*, 33(8): 1416-1432.

Reimchen, T.E., D. Mathewson, M.D. Hocking, and J. Moran. 2002. Isotopic Evidence for Enrichment of Salmon-Derived Nutrients in Vegetation, Soil, and Insects in Riparian Zones in Coastal British Columbia. *American Fisheries Society Symposium 2000*. 12 pp.

Roberts, Christine, Oluna Ceska, Paul Kroeger, and Bryce Kendrick. 2004. Macrofungi from six habitats over five years in Clayoquot Sound, Vancouver Island. *Canadian Journal of Botany*, 82: 1518-1538.

Rodway, M.S. and H.M. Regehr. 1999. Potential density of Marbled Murrelets in valley-bottom old-growth forest in Clayoquot Sound, British Columbia. *Pacific Seabirds*, 26: 3-7.

Schreiber, Dorothy. 2002. Our Wealth Sits on the Table: Food, Resistence, and Salmon Farming in Two First Nations Communities. *American Indian Quarterly*, 26(3):360-377.

Szanislo, Wendy. 2009. *Stellar Sea Lion Abundance and Distribution in Clayqouot and Barkley Sounds.* Poster presentation. 18th Biennial Marine Mammal Conference, Quebec City, Quebec, 11-16 October 2009. Also presented at the Barkley Sound Knowledge Symposium, Bamfield, 9-11 February, 2010. Funding and in-kind support by the CBT, National Marine Mammal Lab, and Pacific Wildlife Foundation.

Steeves, T.E., J.D. Darling, P.E. Rosel, C.M. Schaeff, and R.C. Fleischer. Preliminary analysis of mitochondrial DNA variation in a southern feeding group of eastern North Pacific gray whales. *Conservation Genetics*, 2(4): 379-384.

Stewart, E. Anne. 2004. Communities Play an Important Role in the Recovery of Marine Species at Risk: Pinto Abalone and Sea Otter on the West Coast of Vancouver Island. In: T.D. Hooper. (Ed.) *Proceedings of the Species at Risk 2004 Pathways to Recovery Conference*.

Spoljaric, Mark A. 2008*. Pilot study assessing the impacts of recreation on invertebrates that inhabit the Tofino Mudflats*. Report to CBT on behalf of the Raincoast Education Society and the Clayoquot Field Station.

Theberge, Michelle. 2007. *Human Encounters with Wolves and Cougars in the Pacific Rim National Park Reserve Area: Summary and Analysis of Behaviour.* WestCoast Project PRNPR.

Timko, Joleen A., and John L. Innes. 2009. Evaluating Ecological Integrity in National Parks: Case studies from Canada and South Africa [includes Pacific Rim National Park Reserve]. *Biological Conservation*, 142: 676-688.

Tomascik, T., and H. Homes. 2004. Distribution and Abundance of Northern Abalone (*Haliotis kamtshatkana*) in Relation to Habitat and Predators in Pacific Rim National Park Reserve of Canada, in: T.D. Hooper (Ed.) *Proceedings of the Species at Risk 2004 Pathways to Recovery Conference.*

Trofymow, J.A., and A. Mackinnon (Eds.) 1998. Proceedings of a Workshop on Structure, Processes, and Diversity in Successional Forests of Coastal British Columbia. Victoria BC, February 1998. *Northwest Science*, 72 Special Issue No. 2.

Turner, Nancy J. 2001. "Doing it Right": Issues and practices of sustainable harvesting of non-timber forest products relating to First Peoples in British Columbia. *B.C. Journal of Ecosystems and Management* 1(1): 1-11.

Wipond, Karen J. 1996. *Interpretation and implementation of the mandate to maintain ecological integrity in Pacific Rim National Park Reserve*. MA Thesis, Department of Geography, University of Victoria.

Walker, Ian R. and Marlow G. Pellatt. 2003. Climate Change on Coastal British Columbia – a paleoenvironmental perspective. *Canadian Water Resources Journal*, 28(4): 531-566.

Wilson, Jodie. 2001. *Sustainable Management of Ecotourism: Whale Watching in* ***Tofino****, B.C.,* A Case Study. MA Thesis, Department of Geography, University of Victoria.

Winchester, Neville. 2007. *Year-end Progress Report: Arthropod Biodiversity Across Spatial Scales.* Report to the Clayoquot Biosphere Trust.

Wulff, K. 1996. *An exploratory study of epiphytic macrolichens at Clayoquot Sound, British Columbia, with special emphasis on the chemotaxonomy of the genus Usnea*. Masters Thesis, Department of Biology, Free University of Berlin.

Ucluelet Harbour Project. 2004. *Shorekeeper Surveys – Past Work and Future Opportunities*. Ucluelet.

Van den Drissche, Ruth, Trudy Chatwin and Monica Mather 2000. Habitat Selection by Bats in Temperate Old-Growth Forests, Clayoquot Sound, British Columbia. *Proceedings of a Conference on the Biology and Management of Species and Habitats at Risk*. BC Ministry of Environment, Lands and Parks and University College of the Caribou, Kamloops, B.C. February 1999.

Yakimishyn, Jennifer L. 2003. *Monitoring Spatial and Temporal Patterns Structuring Eelgrass (Zostera marina L.) Fish Diversity in Clayoquot Sound*. MSc Thesis, Department of Geography, University of Victoria.

Yakimishyn, Jennifer L., Cliff L.K. Robinson, and Philip Dearden. 2003. *The utility of beach seining for assessing fish diversity in eelgrass beds of Pacific coastal park reserves*. Presentation to SAMPA-5. Victoria, BC.

Socio-Economic and Cultural Studies (Socioeconomic UNESCO/MAB)

Abrams, Peter E. 2000. *Overcoming obstacles to implementing community-based collaborative governance of natural resources: The case of the Clayoquot Sound Central Regional Board, British Columbia*. Masters in Resource Management Thesis, Simon Fraser University.

Bailey, Richard James. 2001. *Transition in Tofino and Ucleulet: Using Indicators to Become More Sustainable.* Masters Thesis, School of Community and Regional Planning. University of British Columbia.

Beaugrand, Hawley. 2007. Clayoquot Sound Biosphere Region Sustainability Indicators. Directed studies report, Geography, University of Victoria.

Boutilier, Robert G., and Ann C. Svendsen. (c2001?) *From Conflict to Collaboration: Stakeholder Bridging and Bonding in Clayoquot Sound.* (draft transcript)

Butt, Gordon, and Don McMillan. 2009. Clayoquot Sound: Lessons in ecosystem-based management from an industry perspective. *BC Journal of Ecosystems and Management,* 10(2): 13-21.

Davis, Emily Jane. 2009. The Rise and Fall of a Model Forest [Long Beach MF]. *BC Studies*, Issue 161: 35-57.

Dobell, Rod, and Martin Bunton. 2001. *Sound Governance: The emergence of collaborative networks and new institutions in the Clayoquot Sound region*. Background paper for Clayoquot Sound Regional Workshop, September 2001.

George, E.M. 1999. *Living on the Edge: Nuu-chah-nulth History from an Ahousaht Chief's Perspective*. MA Thesis, Department of Geography, University of Victoria.

Goetze, Tara C. 2005. Empowered Co-management: Towards Power-Sharing and Indigenous Rights in Clayoquot Sound, B.C. *Anthropologica*, 47: 247-265.

Guppy, W. 1997. *Clayoquot Soundings: A history of Clayoquot Sound, 1880s-1980s*. Tofino: Grassroots Publication.

Isaac, Thomas F., Morgan A. Troke, Adam D. Wanke, and Joshua Walters. 2009. *B.C. Supreme Court Affirms Aboriginal Rights to Fish and Sell Fish on West Coast of Vancouver Island and Orders Consultation.* McCarthyTétrault Lawyers.

Karpiak, Monica. 2003. *Modeling Nuu-chah-nulth Land Use: The Cultural Landscape of Clayoquot Sound.* Masters thesis. Department of Archaeology, Simon Fraser University.

Lavalle, L., and P. Suedfeld. 1997. Conflict in Clayoquot Sound: Using Thematic Content Analysis to Understand Psychological Aspects of Environmental Controversy. *Canadian Journal of Behavioural Science*, 29(3): 195-210.

Lee, Stuart. 2002. *Hybrids: A literature review and analysis of the Clayoquot Sound Scientific Panel Report.* Clayoquot Alliance Working Paper Series. (81pp. typescript).

Lister, M.K. and T.Q. Murdock. 2010. *Building Resilient Coastal Communities in the Face of Climate Change Impacts on Coastal and Marine Resources and Ecosystems in British Columbia.* Paper presented to the 1st Barkley Sound Knowledge Symposium.

Mabee, Holly Spiro, and George Hoberg. 2006. Equal Partners? Assessing Comanagement of Forest Resources in Clayoquot Sound. *Society and Natural Resources*, 19: 875-888.

Masso, Marc (Sayachapis). 2005. *Tla-o-qui-aht Nation Building Strategy: Ha'wiih and Ma'uas (Chiefs and Houses).* Community Governance Project report in partial fulfillment of a Masters of Arts in Indigenous Governance, University of Victoria.

McNutt, Kate, Barbara Beasley, and Margret Moeges. 2003. Protecting wetland habitat in the Cypre Watershed Planning Unit, Clayoquot Sound, Vancouver Island, British Columbia. *BC Journal of Ecosystems and Management*, 3(1):1-9.

Mendis, Sharmalene. 2004. *Assessing Community Capacity for Ecosystem Management: Clayoquot Sound and Redberry Lake Biosphere Reserves*. Masters thesis, Department of Geography, University of Saskatchewan.

Morford, Shawn, Dave Robinson, Felice Mazzoni, Cleo Corbett and Heidi Schalberger. 2004. Participatory research in rural communities in transition: A case study of the Malapsina-Ucluelet Research Alliance. *BC Journal of Ecosystems and Management,* 5(2): 40-43.

Murdock, Trevor, and Mary Liston. 2009. *Social and Environmental Change and Resilience in Ucluelet, BC.* Paper presented to the 1st Barkley Sound Knowledge Symposium, Bamfield, February 2010

Postnikoff, Heidi. 2005. *Coming Full Circle: Applying a Nuu-chah-nulth Worldview in Community-Based Research.* Senior Research Paper, School of Environmental Studies, University of Victoria.

Pukomen, Jennifer C. 2008. *The Rock Garden Project: Revitalizing Traditional Nuu-chan-nulth Root Gardens in Ahousaht, British Columbia*. MSc. Thesis, School of Environmental Studies, University of Victoria.

Robinson, Katherine, Dan Samuel, and Darlene Watts. 2001. Case Study on the Nuu-chah-nulth Economic Development Corporation, in: John McBride (Ed.) *Our Own Vision-Our Own Plan*. Community Economic Development Centre, Simon Fraser University, March 2001.

Thom, Megan. 2005. *Connections, Challenges, and Clayoquot Sound: Community-based Research in an Indigenous Context*. Research paper, School of Environmental Studies, University of Victoria.

Turner, Nancy. 2003. *Sustaining Forests, Sustaining People: Lessons from Clayoquot Sound, BC*. Paper presented at the Annual General Meeting, Canadian Institute of Forestry.

Turner, Nancy J. and Katherine L. Turner. 2008. "Where Women Used To Get The Food": Cumulative Effects and Loss of Ethnobotanical Knowledge and Practice; Case Study From Coastal British Columbia. *Botany*, 86: 103-115.

White, Brian P. 1999. *Authoring the tourism landscape of Clayoquot Sound (Vancouver Island, British Columbia).* PhD Thesis, Simon Fraser University.

APPENDIX 4

CLAYOQUOT SOUND BIOSPHERE RESERVE

"Civil Society"/NGOs/Programs in the Area

Note: The following list includes national, provincial, regional (within BC) and local organizations or groups that have a declared purpose relevant to the ideals of the Clayoquot Sound Biosphere Reserve. They currently are, or have been active in the region over the last few years, or in some cases they would become so should an issue of concern to them arise there. The 'region' is defined here to include the area of the biosphere reserve along with the Ucluelet area immediately adjacent to it on the coast and extending east to Port Alberni that is the main gateway community on the only road into the biosphere reserve (on BC Highway #4). These organizations contribute in different ways to the conservation of biodiversity, resource stewardship, environmental protection, local economic development, and social well being of people within the region and biosphere reserve.

* = Some cooperative activities with or recipients of funding from the CBT

Aboriginal Mapping Network
Ahousaht Cultural Centre*
    Ahousaht Cultural Youth Centre*
Ahousaht Holistic Centre
Ahousaht Walk the Wild Side Heritage Society
    Wild Side Heritage Trail
Alberni-Clayoquot Continuing Care Society

Alberni-Clayoquot Environmental Research & Education Society
Alberni-Clayoquot Learning Network
Alberni Environmental Coalition
Alberni Salmon Enhancement Society
Alberni Valley Chamber of Commerce

Association of Vancouver Island & Coastal Communities
British Columbia Coalition for Sustainable Forest Solutions
British Columbia Coastal Community Network
British Columbia Wilderness Tourism Association
British Columbia Wildlife Federation
    Alberni District Sportsmen's Association
    Pacific Rim Fish & Game Association, Ucluelet

Boat Basin Foundation
    Temperate Rainforest Field Study Centre
Canadian Coast Guard Auxiliary (Voluntary), Pacific Region, Unit 38 – Long Beach

Canadian Groundfish Research & Conservation Society
Canadian Parks and Wilderness Society (BC Chapter)
    Baja California to Bering Sea Initiative *
Central Westcoast Forest Society
    Clayoquot Community Forest Centre *

Centre for Coastal Health
Centre for Non-Timber Resources, Royal Roads University
Clayoquot Sound Basic Needs Society
Coastal Alliance for Aquaculture Reform, Vancouver
Coastal Family Resource Coalition

Ecojustice (formerly Sierra Legal Defense Fund)
Ecotrust Canada *, 1994
First Nations Environmental Network (Tofino)*
First People's Cultural Foundation *
First Nations Technology Council

First Voices
First Nations Youth Photography Club *
Food Bank on the Edge
Friends of Ecological Reserves
Friends of Clayoquot Sound, 1979*
Greenpeace Canada

Herring Conservation and Research Society
Kackaamin Family Development Centre Society (formerly Kakawis)
Island Wildlife Rehabilitation Station (Saltspring)
La Leche League: Ucluelet Group
Lions Club of Ucluelet

Living Oceans Society (Sointula)
Long Beach Recreation Society*
Maa-nulth Treaty Society
Make It Happen Society – Nurturing Youth and Community Capacities Society *
Narcotics Anonymous
Nism'a Project Society*

Northwest Ecosystem Institute (Lantzville, BC)
Nuu-chah-nulth Central Region Language Group
Nuu-chah-nulth Healing Project
Nuu-chah-nulth Tribal Council*
Oil Free Coast Alliance

Pacific Child and Family Enrichment Society, Nanaimo (& Port Alberni)
Pacific Region Fisheries Conservation Council
Pacific Rim Arts Society*
Pacific Rim Bear Smart Society
Pacific Rim Community Seniors Care Society*

Pacific Rim Hospice Society *, Ucluelet
Pacific Rim Whale Festival Society
Pacific Salmon Foundation
Pacific Wildlife Foundation (formerly the West Coast Whale Research Foundation)*
Port Alberni KAIROS – Ecumenical Justice Initiative

Raincoast Education Society*
    Raincoast Interpretive Centre, 1995*
Royal Canadian Legion, Branch #65, Tofino
Shorekeeper, Ucluelet Chapter
Sierra Club of Western Canada
    Sierra Club, British Columbia
Steelhead Society, B.C.

Strawberry Isle Research Society*
The Pacific Streamkeepers Federation (North Vancouver)
    Alberni Valley Enhancement Association
    Tofino Streamkeepers Society*
Thorton Creek Enhancement Society
Tofino Botanical Gardens Foundation*
    Clayoquot Field Station
Tofino Business Association

Tofino Community Access Society
Tofino-Long Beach Chamber of Commerce
Tofino Natural Heritage Society
Tofino Salmon Enhancement Society
Tofino Shorekeepers Society

Toquaht First Nations Heritage Society
Tonquin Foundation (Tofino), 2003*
Tourism Tofino, 2008
Tourism Ucluelet, 2008
Tsawalk Partnership

Ucluelet and Area Child Care Society
Ucluelet and Area Historical Society
Ucluelet Affordable Housing Committee

Ucluelet Aquarium Society*
Ucluelet Chamber of Commerce
Ucluelet Disaster Relief Society*
Ucluelet Recycling Association*
Ucluelet Salmon Enhancement Society
Uu-a-thluk*

Vancouver Island Regional Wildlife Management Society
West Coast Aquatic *

West Coast Bear Aware Committee*
West Coast Community Resource Society*
(formerly Westcoast Women's Resources Society)
West Coast Environmental Law
West Coast Inland Search and Rescue Society

West Coast Learning Network
West Coast Multiplex Society
West Coast Tourism Association
West Coast Transition House
Western Canada Wilderness Committee

Wetland Stewards of the the Clayoquot Biosphere Region
Wickaninnish Community School Society*
Wild Pacific Trail Society*