

# THE *Johnstone - Bute* COASTAL PLAN



BRITISH  
COLUMBIA

Ministry of  
Sustainable Resource Management  
Coast and Marine Planning Branch

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*The Johnstone - Butte*

COASTAL PLAN



BRITISH  
COLUMBIA

## NEWS RELEASE

For Immediate Release  
2004SRM0046-001072  
Dec. 15, 2004

Ministry of Sustainable Resource Management

**COASTAL PLAN PROMOTES ECONOMIC DEVELOPMENT**

CAMPBELL RIVER – The Johnston-Bute Coastal Plan identifies sustainable marine development and diversification opportunities while maintaining environmental values in the region, announced North Island MLA Rod Visser today.

“The plan helps identify appropriate sites for investment and reinforces local community and First Nations efforts to improve and expand economic development,” said Visser. “With this plan in place we will see the local economy benefit from the enhancement of aquaculture and tourism.”

The coastal plan identifies potential sites for recreation and tourism, shellfish and finfish aquaculture as well as structures associated with upland development, including docks, wharves and other infrastructure. All key interest groups, including First Nations, industry, environmental and recreation organizations, participated in the development process.

“Communities and industry have told us they need stable, sustainable opportunities to support investment and jobs for their families and the future,” said Minister of Sustainable Resource Management George Abbott. “With this plan we have been able to work with local communities and First Nations to create certainty for access to natural resources and identify areas to increase investment opportunities while conserving areas that are environmentally sensitive.”

“The plan gives new and existing marine based tourism operators a great source of information to effectively allow for the development and analysis of tour products and opportunities,” said Jim Davis, owner/operator of Destiny River Adventures and Moutcha Bay Resort.

The plan was developed collaboratively with Department of Fisheries and Oceans and continues the working relationship piloted in the Quatsino Sound Coastal Plan process. This helps all levels of government work together to share data and build a co-operative approach to outstanding concerns regarding habitat management.

The Johnstone-Bute Coastal Plan area is located in the Johnstone Strait and Discovery Islands between Vancouver Island and the Mainland coast and includes associated channels and inlets. The area encompasses 1,099 km of shoreline and 83,996 hectares of marine area.

-more

The plan is available at: [http://srmwww.gov.bc.ca/rmd/coastal/north\\_island/johnstone\\_bute/index.htm](http://srmwww.gov.bc.ca/rmd/coastal/north_island/johnstone_bute/index.htm) online.

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Visit the Province's website at [www.gov.bc.ca](http://www.gov.bc.ca) for online information and services.



Minister of Sustainable Resource Management George Abbott and MLA North Island Rod Visser announce the completion of the Johnstone-Bute Plan. Maritime Heritage Centre: Campbell River



Chief Darren Blaney comments on the participation of the Xwémalhkwu (Homlaco) First Nation in the development of the Johnstone-Bute Coastal Plan.; joined by Comox Strathcona Regional District Chair Jim Abrams (left) and Chief Dallas Smith (Tlowtsis First Nation). Maritime Heritage Centre: Campbell River



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Your file Votre référence

Our file Notre référence

Fisheries and Oceans Canada is pleased to have worked in close collaboration with the Province of British Columbia in the development of the Johnstone - Bute Coastal Plan.

This plan is considered a positive step towards the development of a truly collaborative Integrated Management Plan for the area. As this plan evolves, the Department will continue to work with the Province to develop additional decision support tools and advice to meet federal fish habitat and integrated oceans management needs.

Fisheries and Oceans Canada has been an active participant in the process to develop this plan and has contributed significant biological resource information to the project. In addition, DFO provided advice and interpretations on various federal statutes and policies in order to provide clarity to proponents and tenuring interests alike in the Johnstone - Bute area.

The recommendations in this plan were arrived at through a process that engaged a wide cross section of stakeholders, including First Nations (Xwemmalhkwu and Comox First Nations and the Hamatla Treaty Society) and the local community. Some local First Nations chose not to participate in this process.

The Johnstone - Bute Coastal Plan builds on previous plans by providing more detailed information on areas of ecological significance and valued habitats and by incorporating references to decision support tools that are under development, as part of the management guidance in each planning unit. While future tenuring activities in the Johnstone - Bute area will be informed by and consistent with this plan, it is recognized that this plan does not fetter the jurisdictional authority of the Minister of Fisheries and Oceans. As well and most important of all, by collaborating on this Coastal Plan and by linking it to other federal, provincial and local planning and management tools, we are providing leadership in responding to the complexity of jurisdictions in Canada's Pacific waters.

I am encouraged by the progress of our respective teams as they continue to work toward the development of coastal planning products that will satisfy the needs of both governments. I look forward to further developing the process and approach for collaborative Integrated Management of marine waters in B.C.

Signed,

Paul Sprout  
A/Regional Director General  
Pacific Region

Canada

## ACKNOWLEDGEMENTS

The Johnstone-Bute Coastal Plan was shaped by the advice and kind support of many individuals.

Special thanks are extended to the plan advisory committee for their hard work, advice and insight. The committee was comprised of the following local members: Rupert Gale, Jim Davis, Heather Sprout, Charlie Cornfield, Chief Darren Blaney, Jim Heppner, Linda Jay, Shawn Burke and Jim Abram.

The Plan benefited greatly from the participation and review by the Xwémalhkwu First Nation, particularly Chief Darren Blaney, Clyde Leo, Florence Hackett, Bill Blaney, Jimmy Wilson, Marion Harry, and their advisors, Mike Morrell, Eric Blueschke, Randy Bouchard, Dorothy Kennedy and Lee Schmidt (formerly Caffrey). The Comox First Nation provided input and review, in particular Chief Ernie Hardy, Richard Hardy and Council. The Hamatla Treaty Society also provided valuable input through Lawrence Lewis, Dan Smith, Rod Naknakim, Wayne Jacob and Johnny Nelson.

The Plan was improved upon by the knowledge and expertise of the staff of DFO, in particular: Steve Diggon of the Central Coast Area office, Captain Chris Bunn, Fisheries Guardian and Melody Farrell of the Regional Oceans/Habitat Branch.

Provincial and federal government staff made important contributions to the Plan. Thanks are extended to Duncan Williams, Ken Albrecht, Sean Herbert and Richard Brunning (LWBC), Jim Russell and Gary Caine (MAFF), Jim Naylor, Jim Schellenberg and Bob Gowe (Canadian Coast Guard), Krista Amey, and staff (Canadian Wildlife Service).

Thanks are also extended to staff at the Regional District of Comox Strathcona for their assistance and input; in particular, Gerard LeBlanc, Deborah Sargent, Lisa Brinkman, Lisa Berg and Judith Walker.

The plan was prepared by Graham Winterbottom, John Bones, Rob Paynter and Chad Egan (MSRM, Victoria) with technical and mapping support from Rick Deegan and Carol Ogborne (MSRM, Decision Support Services). Valuable consulting assistance was provided by Violet Kormori, Rupert Wong, Gary Robinson and Brian Woodman.



## Acronyms

<b>BCRMCA:</b>	BC Ready Mix Concrete Association
<b>CCG:</b>	Canadian Coast Guard, Fisheries and Oceans Canada (Note – responsibilities for Navigable Waters Protection Act currently in transition to Transport Canada)
<b>CCLRMP:</b>	Central Coast Land and Resource Management Plan
<b>CCME:</b>	Canadian Council of Ministers of Environment
<b>CDC:</b>	Provincial Conservation Data Centre, WLAP
<b>CMPB:</b>	Coast and Marine Planning Branch, MSRM
<b>COSEWIC:</b>	Committee on the Status of Endangered Wildlife in Canada
<b>DFO:</b>	Federal Department of Fisheries and Oceans (also known as Fisheries and Oceans Canada)
<b>FRAP:</b>	Fraser River Action Plan
<b>GVRD:</b>	Greater Vancouver Regional District
<b>HEB:</b>	DFO Habitat Enhancement Branch
<b>LWBC:</b>	Land and Water British Columbia Inc.
<b>MAFF:</b>	Provincial Ministry of Agriculture, Food and Fisheries
<b>MEM:</b>	Provincial Ministry of Energy and Mines
<b>MOE:</b>	Provincial Ministry of Environment
<b>MOF:</b>	Provincial Ministry of Forests
<b>MSRM:</b>	Provincial Ministry of Sustainable Resource Management
<b>RDCS:</b>	Regional District of Comox Strathcona
<b>WLAP:</b>	Provincial Ministry of Water, Land and Air Protection. This agency includes the Provincial Park and protected areas management and planning function.

## Definitions

**Aquaculture Capability:** The likelihood of an area's biological, physical or oceanographic attributes to successfully accommodate the growing or cultivation of shellfish, finfish or marine plants for commercial purposes, using standard methods and equipment. In the case of finfish capability, ratings in this Plan are drawn from an "aquaculture opportunity study" map, which included capability as well as government siting criteria associated with other resources and land designations.

**Blue Listed Species:** Includes any indigenous species or subspecies considered to be vulnerable in British Columbia.

**Foreshore (intertidal) area:** The area between the mean high tide and low tide mark (i.e. below zero tide).

**Invertebrates:** Includes red, green urchins, octopus, crab, prawn, shrimp, sea cucumber.

**Land Act Notation of Interest:** A notation on LWBC reference maps of an interest in an area of Crown land by another government agency. It ensures an initial referral to agencies whose particular mandate, programs or interests may be affected by the issuance of tenure, and provides the opportunity for the affected agency to identify priority issues, concerns or conditions. It may be used over areas where further planning is contemplated. It does not preclude the acceptance of land applications.

**Land Act Reserve:** A reserve established on LWBC reference maps to temporarily withdraw Crown land from disposition by tenure. A reserve is placed over an area to permit other agencies to undertake planning, to provide temporary protection or to maintain options for future use.

**Nearshore area:** The sub tidal area below low tide mark (i.e. below zero tide), generally extending to the 20 metre bathymetric depth.

**Offshore area:** the sub tidal area seaward of the 20 metre bathymetry depth.

**OA1:** Finfish aquaculture opportunity study map category (Opportunity Area 1), used to denote areas with high to moderate biophysical capability for finfish aquaculture; and which meet current government siting criteria.

**OA2:** Finfish aquaculture opportunity study map category (Opportunity Area 2), used to denote areas with low to poor biophysical capability for finfish aquaculture; and which meet current government siting criteria.

**Red Listed Species:** Includes any indigenous species or subspecies that have, or are candidates for status as extirpated, endangered, or threatened species in British Columbia.

**Tenure:** A legal right to occupy and use Crown land under the *Land Act*. Tenure may take the form of a permit, licence of occupation or lease. The type of tenure is normally dictated by LWBC policy and conveys different rights, terms and conditions of use and occupancy.

**UREP:** A *Land Act* reserve or notation of interest established for the “use, recreation and enjoyment of the public.”

**Upland:** The terrestrial area extending approximately 200 meters inland from the highest tide line.

## INTRODUCTION

### 1.1 Location

The Johnstone-Bute Coastal Plan Area is situated on Canada's Pacific coast between Vancouver Island and the mainland of British Columbia (Figure 1). The Johnstone-Bute Plan Area extends from Port Neville on Johnstone Strait through to the northern portion of Discovery Passage and includes the foreshore and nearshore areas of Vancouver Island, the mainland coast and the associated islands and islets within this area. The two largest inlets within the Plan Area are Loughborough and Bute Inlet (Figure 1). In total, the Plan Area extends approximately 102 km from east to west, encompassing 1,099 km of shoreline and 83,996 ha of marine area.



Figure 1. Johnstone-Bute Coastal Plan Area

### 1.2 Plan Rationale and Intent

Many coastal communities in British Columbia have experienced significant economic decline and population loss due to reductions in industrial forestry and commercial fishing. Many of those communities are looking for opportunities to diversify and expand their economies while protecting sensitive resources and values. A priority of the Ministry of Sustainable Resource Management (MSRM) is to use coastal planning to enhance sustainable economic development opportunities of coastal communities (including First Nations communities) while maintaining environmental values.

The Johnstone-Bute Plan Area currently supports a range of economic activities. These include various commercial fisheries, finfish aquaculture, shellfish aquaculture, log handling and storage, marine transportation, and public and commercial recreation. The Plan Area also contains an array of sensitive resources and cultural values.

The Johnstone-Bute Coastal Plan provides the basis for coastal development on an environmentally sustainable basis. This Plan is consistent with the MSRM governance principles for sustainability, presented in Appendix 1.

### 1.3 Jurisdiction and Scope

The Johnstone-Bute Coastal Plan provides recommendations for acceptable uses of foreshore and nearshore areas within the provincial government's jurisdiction. This overview is neither a legal interpretation, nor a position statement of the Province of British Columbia; nor does it address First Nations' rights and title issues.

Jurisdiction in the coastal zone is complicated by the relationship between land (including seabed) ownership and legislative authority over resources. There is a common public misconception that the Province has no jurisdiction or role in coastal management, due to federal government authority over fisheries management, marine mammal management, migratory birds, and marine transportation and safety, as well as the high profile of these issues within coastal communities.

The Province, however, is an important land owner in the coastal zone. The Province owns the foreshore (intertidal) areas of its coastline. In addition, the Province owns coastal "inland waters", or waters "within the jaws of the land" (*intra fauces terrae*), and the lands covered by these waters. Inland waters are waters within an indented coastline, such as harbours, bays and estuaries, including areas between headlands along the outer coast. The Supreme Court of Canada, in a 1984 decision, also confirmed the Province's ownership of the waters and the lands, minerals and other natural resources of the seabed and subsoil in the Georgia, Juan de Fuca, Johnstone

and Queen Charlotte Straits. Thus, many sub-tidal areas are also owned by the Province.

Offshore areas along British Columbia's western coastline from the low water mark, or from the boundaries of inland waters, seaward to the territorial limit are owned by the federal government.

Accordingly, the Province's ownership and legislative jurisdiction over such matters as the management of provincially owned public lands provide the rationale for provincial coastal planning, park and ecological reserve establishment, and tenure of coastal foreshore and inland waters.

Local governments and private property owners also influence coastal management activity through zoning by-laws, regulations and development requirements, and upland owner riparian rights. In addition, First Nations have legally established Aboriginal rights that may be potentially affected by coastal developments, and which must therefore be taken into account by the provincial government in the decision making process for foreshore and nearshore use applications. Provincial consultation policies reflect recent court decisions and require provincial agencies to seek to accommodate First Nations interests in land use decision making processes.

The Xwémalhkwu (Homalco), We Wai Kai, K'omox, We Wai Kum, Kwiakah, Tlowitsis and Klahoose First Nations are all presently in the B.C.T.C. treaty negotiation process with the provincial and federal governments. These First Nations have made claims of rights and title over land and waters in the Plan Area.

Hamatla Treaty Society, a non-profit administrative body serving We Wai Kai, K'omox, We Wai Kum, Kwiakah, and Tlowitsis First Nations, has identified traditional territories covering the entire Plan Area. The Xwémalhkwu (Homalco) First Nation has identified traditional territory that extends across much of the Plan Area. The northern extent of the Klahoose First Nation's traditional territory falls within the Plan Area's southern limit. The Ministry of Sustainable Resource Management takes no position on these views within the context of the Johnstone-Bute Coastal Plan.

This Plan provides recommendations for acceptable uses for foreshore and nearshore waters included under provincial jurisdiction. These recommendations address a range of tenure programs that are

administered by Land and Water British Columbia Incorporated (LWBC). The Plan also addresses recreation and conservation values that should be reserved or limited with respect to tenure opportunities. The Plan does not replace the tenure referral process of LWBC, nor does it imply that types of applications deemed acceptable in the Plan will be approved by LWBC after the referral process is completed.

This Plan does not make recommendations regarding use of private land, federal land, or Indian Reserves. Its recommendations are not intended to limit any treaty negotiations or settlements that may occur respecting foreshore and nearshore rights, ownership or uses. Its recommendations are also not intended to alter or interfere with provincial legislation or local area by-laws, although it is preferred that local government plans and this plan be compatible.

#### 1.4. Planning Process

The planning process used to develop and complete the Johnstone-Bute Coastal Plan is generalized in Table 1. The process was led by government staff and took a consultative approach to public and interest group engagement, rather than consensus-based negotiation using stakeholder planning tables.

Consultation with the public took place primarily through public open house meetings, held on September 18, 24 and the 25 of 2003 and again on March 10, 11 and 12 of 2004. The Plan was also reviewed with interest groups, stakeholders and industry associations at various stages throughout the process. A local plan advisory committee was formed of volunteers representing the different areas and interests within the Plan Area. The group met 6 times during plan development to review and discuss various planning materials and strategies. The final plan reflects input and advice provided by the committee, but should not be construed as representing their agreement on its recommendations. First Nations in the area were consulted upon and asked to provide input for Plan development. A list of these groups and meetings is provided in Appendix 2.

**Table 1. Generalized Process for the Johnstone-Bute Coastal Plan**

<b>January/April 2003</b>	Confirm provincial technical team and terms of reference Confirm process agreements with First Nations and CSRD
<b>May/August 2003</b>	Develop and acquire resource data and appropriate map products Meetings with stakeholders and interest groups Hold public open houses to advise public of planning process
<b>September/ December 2003</b>	Establish local advisory committee of stakeholders and local government Review draft plan with advisory committee, individual First Nations and government agencies
<b>January 2003</b>	Review draft plan with range of stakeholders, First Nations and CSRD Plan revisions Draft Plan posted on web site
<b>February/March 2004</b>	Open houses to present plan to communities and stakeholders Plan revisions with advisory group Further revisions as necessary
<b>April - November 2004</b>	Assessment of economic and environmental implications of the Plan Formal review by First Nations Formal review by CSRD Further revisions as necessary
<b>December 2004</b>	Plan revisions as necessary Sign-off by provincial government



## PLAN AREA DESCRIPTION

### 2.1. Physical and Oceanographic Features

#### ■ LANDSCAPE ■

The landscape of the Plan Area consists of a highly indented coastline, with numerous islands and islets. Figure 2 presents a satellite image of the Plan Area landscape.

The Plan Area includes: one major marine passage (Johnstone Strait and the northern portion of Discovery Passage), two long inlets (Bute and Loughborough) and a series of channels between Vancouver Island, the mainland and five smaller islands in between known collectively as the Discovery Islands (Hardwicke, West Thurlow, East Thurlow, Sonora and Stuart).



**Figure 2.** Topography and Land Use Patterns in the Johnstone Strait/ Bute Inlet area

Source: MSRM Decision Support Services 2003

The eastern portion of the Plan Area is dominated by the waters, beaches and islands of the lower half of Johnstone Strait, including Sunderland Channel and Loughborough Inlet. The remaining portion of the Plan Area consists of Discovery Passage, as well as Phillips Arm, Frederick Arm, Bute Inlet and the series of channels and islands between Vancouver Island and the mainland. The entire Plan Area is situated to the east side of Vancouver Island (inclusive) and is subsequently sheltered from the Pacific Ocean's wind and wave action.

Bute Inlet is a deep water fjord stretching from Calm Channel, 75 km inland to its head at Waddington Harbour. It has one main basin with a maximum depth of 650m and an outer sill at Calm Channel 370m deep. Loughborough Inlet to the west of Bute Inlet, is not as deep or as wide but stretches almost as far inland and is situated roughly parallel to the larger inlet. Other large bodies of water include Phillips Arm, Port Neville, Frederick Arm, Topaze Harbour, Jackson Bay, Kelsey Bay and Forward Harbour. The uplands surrounding the water bodies are topographically diverse with mountains delineating various catchments flowing into the Plan Area. Eastward of the Plan Area are the Coastal Mountains with the Homathko Ice field surrounded by Cambridge (2704m), Howard (2575m) and Plateau (2545m) peaks. To the west is the Northern Island Mountain Range with Kokummi and Watchtower peaks both approximately 1500m high.

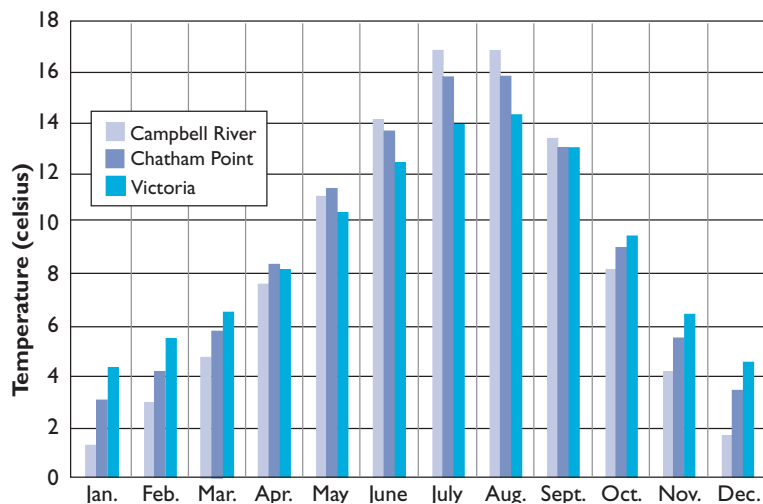
#### ■ CLIMATE ■

The only climate station within the Plan Area is at Chatham Point, located in the southern portion of the Plan Area at the convergence of Johnstone Strait and Discovery Passage. The climate station at Campbell River, approximately 30 km southeast of the Plan Area, provides supplemental data; the Victoria airport climate station provides a comparison with southern regions of Vancouver Island.

In comparison to the Campbell River station, Chatham Point exhibits noticeably warmer temperatures in the winter and cooler in the summer with a daily mean range of 3.1 °C in January to 15.8 °C in July and August (Figure 3). Victoria displays warmer winter temperatures than either Campbell River or Chatham Point with a mean of 4.4 °C in January and cooler temperatures in the summer with a mean of 14°C in July.

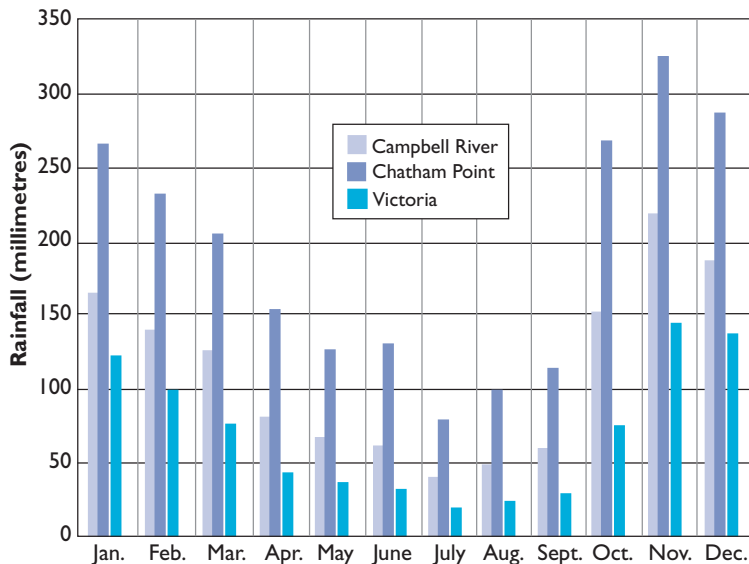
The Chatham Point station receives an annual average of approximately 2200mm of precipitation. Campbell River in comparison, receives approximately 1450mm annually and Victoria 1200mm (Figure 4). The minimum monthly average precipitation at Chatham Point is in July (78 mm), followed by a sharp increase in October (267 mm)





**Figure 3.** Mean monthly temperatures at the Campbell River, Chatham Point and Victoria 1971- 2000

Source: Environment Canada National Climate Archive [www.climate.weatheroffice.ec.gc.ca](http://www.climate.weatheroffice.ec.gc.ca)



**Figure 4.** Mean monthly precipitation levels at Campbell River and Chatham Point 1971-2000

Source: Environment Canada National Climate Data [www.climate.weatheroffice.ec.gc.ca](http://www.climate.weatheroffice.ec.gc.ca)

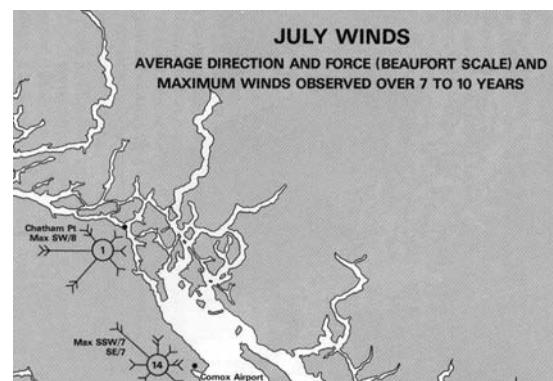
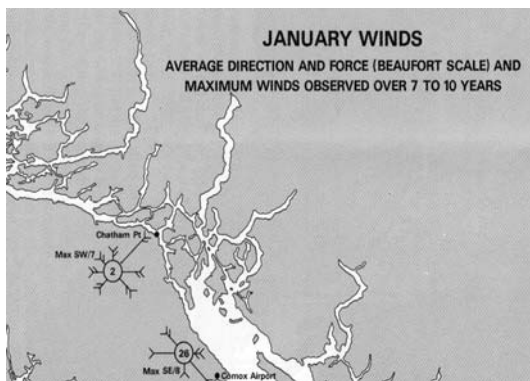
and a maximum monthly average precipitation in November (323 mm).

The implication for marine planning in the area is the potential creation of a brackish surface layer within many of the enclosed bays and inlets. Surface run off from precipitation may also lead to elevated levels of stream deposition thus impacting the structure of the nearshore marine environment.

## WINDS

Prevailing winds in Johnstone Strait are westerly in summer and easterly in winter. Upon entering Discovery Passage they are funneled into northerly and southerly winds, respectively (Figure 5). Winds in the Plan Area are heaviest in winter months and tend to run parallel to shore, from the northwest and southeast.

Outflow winds from the many large inlets in the Plan Area can create dangerous conditions near the mouths of the inlets when they run against an incoming tide; colder Arctic outflows may also cause surface layers to freeze up. Bute Inlet experiences fierce winter winds generated in the interior Homathko/Chilcotin areas inland from the head of the Inlet; as winds increase they may spill over higher passes and into Frederick Arm and Phillips Arm. Port Neville and Loughborough Inlet



**Figure 5.** Wind Roses showing average direction and force and maximum winds observed at Chatham Point and Comox Airport in January (left) and July (right).

Length of arrow indicates proportion of time wind comes from that direction, number of 'feathers' on arrows indicates strength of strongest winds from that direction, and number in circle shows percentage of calm air.

Source: CHS Sailing Directions BC Coast (South Portion), 1990

are also susceptible to interior outflow winds generated through Knight Inlet.

In summer, winds are generally lighter, though storms capable of producing winds which can threaten the safety of marine transportation, fishing, and other activities, can occur in any season.

## ■ TIDES ■

Mean tidal range in the Plan Area is approximately 2.8 m, while the average range of large tides is 4.8 m (at Owen Bay, a reference Port). Larger tides are produced when the pull of the sun and moon are aligned (spring tides). Related to these ranges, low tides expose mud flats at river estuaries and sandy beaches on more exposed coasts. Many marine species, including commercially important shellfish species, are adapted to specific portions of the intertidal zone.

Tidal fluctuations at Big Bay, located on Stuart Island near the confluence of Johnstone Strait and Bute Inlet, conform to a mixed, mainly semi-diurnal (MSD) pattern with two high tides (one being higher) and two low tides (one being lower) every 24 h 50 min.

## 2.2. British Columbia Marine Ecological Classification

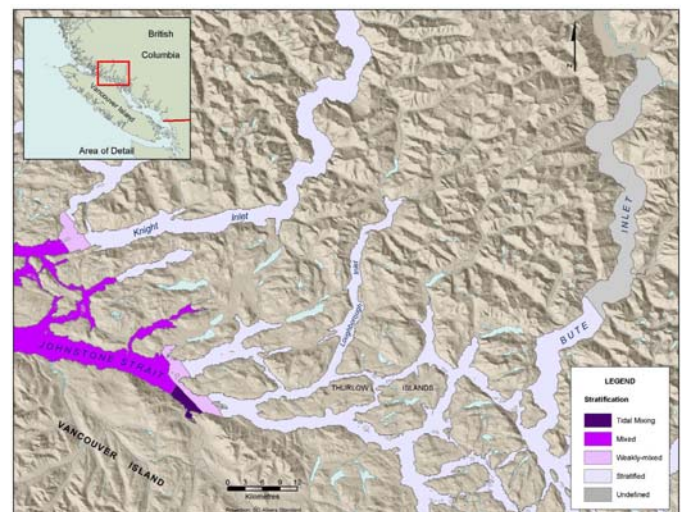
The nine criteria of the BC Marine Ecological Classification (BCMEC) system have been included as descriptors for each of the 20 Planning Units and can be found in the table at the beginning of each unit. The BCMEC is a hierarchical approach that uses physical characteristics of the marine environment to identify distinct systems within the larger marine environment. The strengths of this system are that it is based upon data that is generally accessible for the entire coast and upon elements that remain largely consistent even in the dynamic marine environment. At the most precise level (marine ecounits), defining criteria include: stratification, surface salinity, depth, wave exposure, benthic relief, slope, tidal current, benthic temperature and seabed substrate. The first two criteria (stratification and surface salinity) were used to delineate pelagic ecounits or that portion of the water column not including the seabed (benthos) and the foreshore. The remaining seven criteria were used to formulate the benthic ecounits, which consist of the entire seabed and the foreshore. A more detailed report on the BCMEC can be found at: <http://srmwww.gov.bc.ca/dss/rpts>

Each of these criteria enables a better understanding of the influences a body of water is subject to and provides a sense of its characteristics as habitat and the capability to support human uses and activities. The six criteria used to delineate them are detailed below.

## ■ STRATIFICATION ■

Stratification refers to the formation of distinct layers of water having consistent physical characteristics as a consequence of the combination of surface temperatures and salinity which together determine the density of a body of water. Where temperature and salinity are generally consistent, such as in the open ocean, water will form into distinct layers. Closer to shore, currents and the physical structure of the shoreline and seabed disrupt these layers by forcing mechanical mixing of the layers.

The seaward regions of the Plan Area are characterized by rapid currents, narrow passages, and plentiful shallow sills; consequently the water is continually being mixed from top to bottom (Figure 6). This is exemplified by invariable salinity levels in Johnstone Strait and year round homogeneity of dissolved oxygen values from top to bottom. Strong bottom currents in the seaward waters of Johnstone Strait carry freshly oxygenated water over the floor of the channels, stimulating the growth of marine life. Conversely, the protected inlets and interconnecting passages in the eastern half of the Plan Area are less affected by these current patterns and are typified by heavily stratified layers.



**Figure 6.** Stratification in the Johnstone - Bute Plan Area

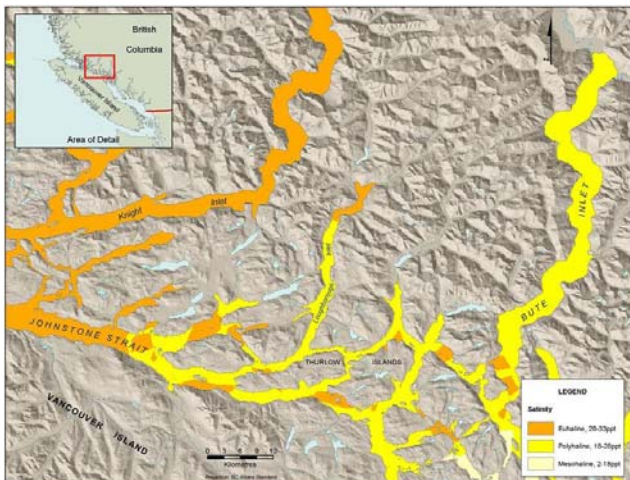
Source: Provincial Resource Management Information System, British Columbia Marine Ecological Classification, 2001

## ■ SALINITY ■

Salinity is affected primarily by the volume of freshwater runoff entering the coastal area. Inshore waters, such as along coastal fjords, exhibit seasonal fluctuations in salinity in keeping with seasonal variations in freshwater runoff. In some cases, salinity may be higher in nearshore areas as shallow depth and limited circulation result in evaporation taking on greater significance. Salinity is a factor in the establishment of certain marine plants and may be a factor in the siting of intertidal and nearshore cultivation of shellfish.

Flowing into Bute Inlet at Waddington Harbour are two main rivers, the Homathko River and the Southgate River. Homathko River, the larger of the two, drains an interior watershed containing several permanent ice fields. Freshwater discharge to Bute Inlet is lowest in winter months due to the storage of snow and ice in higher elevations of these interior watersheds. Because of snow and ice melt from these ice fields, runoff to Bute Inlet is delayed and highly seasonal, rising in April and peaking in July. There is no significant increase in the spring and summer flow of the smaller streams of Vancouver Island and the coastal mainland because most of them are rain fed throughout the year.

In response to the yearly runoff Bute Inlet and the surrounding passageways experience a reduction in salinity levels as illustrated in Figure 7. Johnstone Strait exhibits more stable salinity levels due to its proximity to the open ocean and its associated higher currents and mixing. A slight increase in salinity occurs in the seaward direction and to an even lesser extent, with depth.



**Figure 7. Average Annual Minimum Surface Water Salinity in the Johnstone - Bute Plan Area** Source: Provincial Resource Management Information System, British Columbia Marine Ecological Classification, 2001

## ■ DEPTH ■

Depth serves primarily to distinguish between areas where sunlight can penetrate to the bottom (photic zone) and deeper areas. As sunlight drives photosynthesis, static marine plants are generally concentrated in shallower areas providing both nutrients and habitat for other organisms. In terms of human use, depth is a factor in determining the form a nearshore structure should take (i.e. floating vs. fixed) and has been used as an indicator of an area to absorb by-products of activities (i.e. greater theoretical dilution of waste material in deeper sites). The Plan Area contains a variety of depths, ranging from the deep fjordal waters of Bute Inlet to the shallower regions of Port Neville.

## ■ WAVE EXPOSURE ■

Wave exposure serves broadly to distinguish the open coast from island groups and inlets and provides a measure of the mechanical wave action on the shore. Exposed areas with high energy wave climates characteristically exhibit a shoreline composed of rocky headlands and sandy embayment.

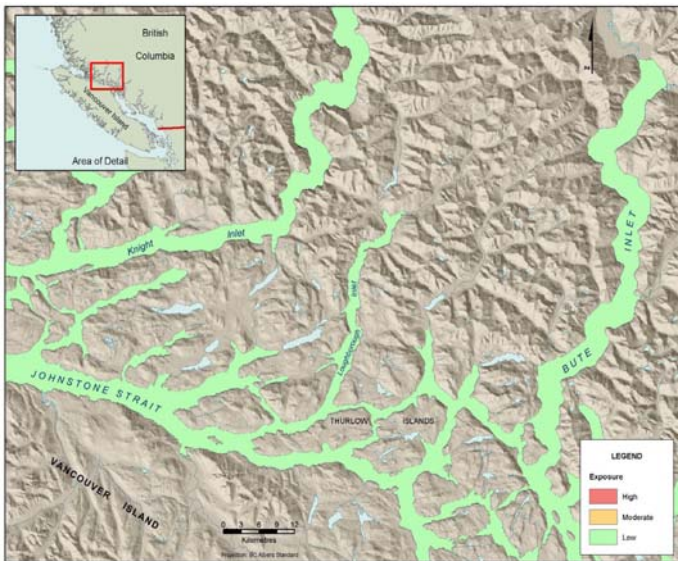
Although the western-most portion of the Johnstone - Bute Plan Area is prone to more vigorous wind and wave conditions than the low wave-energy conditions present in the sheltered inlets and smaller fjords, the entire Plan Area is rated low in terms of exposure to open ocean conditions. The mapped exposure regimes in Figure 8 do not consider the effect of wind generated waves such as those that occur in the large inlets such as Bute and Loughborough.

The relatively low exposure rating for the area indicates that wave action is limited when compared to other parts of the BC coast. This is due mainly to the narrow, winding nature of the many channels and the limit to the fetch of the wind in the area. Because waves produced in the longest length of Johnstone Strait tend to run ashore on either side, as do waves formed in the shorter basins and inlets, rough seas and large swells do not usually develop in the region.

## ■ BENTHIC RELIEF ■

Seabed or benthic relief refers to the overall regularity of the seabed. An area with low relief will have a relatively uniform slope and little variation in elevation, such as a flat mud bottom. High relief areas exhibit considerable ranges in slope and elevation, as in the case of a rock reef. Relief plays a





**Figure 8.** Exposure Regimes as an indicator of Wave Climates in Johnstone Strait and Bute Inlet Note: this is an indication of exposure to open ocean only and does not consider the effect of wind generated waves such as those that occur in the large inlets such as Bute and Loughborough.

Source: Provincial Resource management Information System, British Columbia Marine Ecological Classification, 2001

role in water column mixing but more obviously, an area with high relief is indicative of habitat for many organisms, notably rockfish and lingcod. The majority of the Plan Area seabed is of low roughness.

## ■ CURRENTS ■

Currents represent an important consideration in the distribution of nutrients and planktonic larvae. Areas of high current are generally well-mixed with higher productivity levels than similar low current areas. As a rule, human activities generally avoid high current areas where lower current areas provide alternatives due to the inherent design and management challenges of higher energy conditions.

Johnstone Strait is characterized by fast moving and rectilinear tidal currents, especially at the seaward extremity of the water body near Kelsey Bay. Flood currents in Johnstone Strait are toward the east, while ebb currents move westward. In Discovery Passage this pattern is reversed as floods are toward the south and ebbs towards the north.

Some of the fastest currents on the coast are in the areas of Okisollo Channel and Stuart Island. The currents in Dent, Yuculta and Arran Rapids, as well as Gillard and Barber Passage, average between 8 -14 knots and contain numerous violent whirlpools and overfalls.

## ■ BENTHIC TEMPERATURE ■

Temperature is a factor in marine environments due to its influence on species assemblage. Temperature is known to be a factor in habitat selection for certain organisms including invertebrates and larval fish. Water temperatures in Johnstone Strait and Bute Inlet are largely controlled by the temperature of the Pacific Ocean, which is generally cool at this latitude. In summer, shallow nearshore waters become warmer, but the deeper water bodies have a relatively consistent temperature year round. The shallow and sheltered waters, which surround various islands and islets throughout the Plan Area, also tend to have warmer temperatures than the wider and deeper channels of Johnstone Strait and upper sections of Loughborough and Bute Inlets (Figure 9). In winter and spring, Johnstone Strait becomes uniformly cold from top to bottom, with maximum temperatures during these seasons hovering around 7°C.



**Figure 9.** Minimum Summer Benthic Water Temperature in the Johnstone - Bute Plan Area

Source: Provincial Resource Management Information System, British Columbia Marine Ecological Classification, 2001

## ■ SEABED SUBSTRATE ■

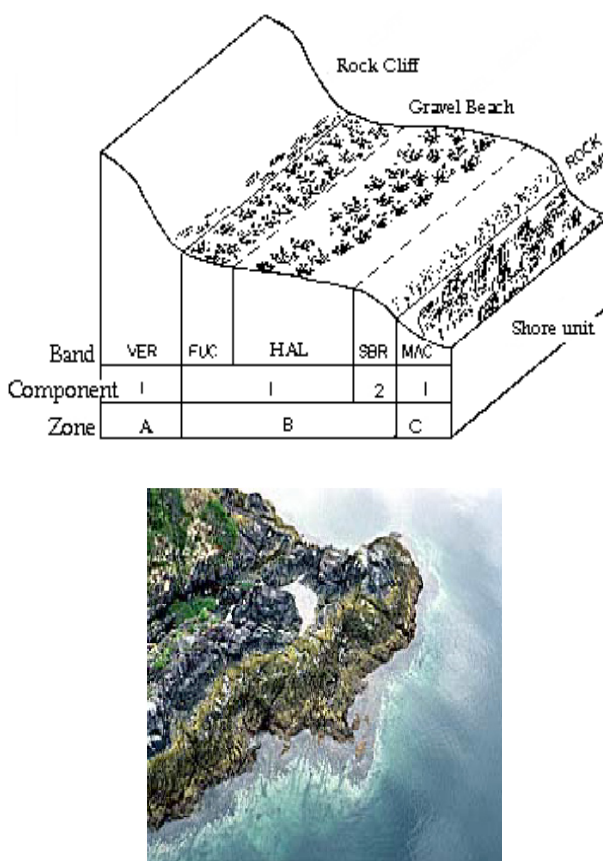
Seabed substrate ranges from mud through sand to hard surfaces, including bedrock, boulders, cobble and gravel and is an important indicator of habitat. Substrate also provides a sense of system energy; fine sediment, such as silt, takes relatively little energy to be held suspended in the water column while considerably more energy is required to mobilize larger cobble. Consequently mud bottoms typically occur in low energy, depositional environments while harder materials (rock and gravel) represent higher energy, frequently scoured environments. Many areas

within the Plan Area, such as Topaze Harbour, consist of mud substrate while areas of high current, such as Okisollo Channel, exhibit hard substrate types.

### SHORE ZONE PHYSICAL FEATURES

The most stable marine systems are those found at the interface between marine and terrestrial environments, both at the bottom (benthic) and along the shoreline. While the marine ecounits system is an effective instrument for assessing conditions in the more remote benthic regions, the accessibility of the shoreline allows for a more precise examination of substrate and structure. Originally undertaken in response to concerns regarding the impact of marine oil spills, detailed physical shore-zone mapping of the British Columbia coastline has been underway for several decades (Howes, Harper & Owen, 1994. Physical Shore-zone Mapping System for BC. <http://srmwww.gov.bc.ca/risc/pubs/coastal/pysshore/index.htm>). This work provides a framework for recording of shore morphology, shore-zone substrate and wave exposure characteristics (for more information see: <http://srmwww.gov.bc.ca/dss/rpts/BCBiophysicalShore-ZoneMapping.pdf>).

More recently, studies have linked these physical shoreline types to assemblages of species (Figure 10).



**Figure 10. Shore Zone Biobands**

From Howes, Harper & Owen, 1994 Physical Shore-Zone Mapping

**Table 2. Shore Zone Classification Criteria**

Shoretype Classification	Criteria	Characterization
Substrate	Rock	Sediment Absent or extremely scarce
	Rock & Sediment	Sediments occur as developed beach forms or large patches
Sediment	Gravel	>2mm
	Sand & Gravel	
	Sand	<2mm
	Sand/Mud	<2mm
	Mud	
	Organics/Fines	
Width	Narrow	<<30m
	Wide	>30m
Slope	Steep	>20°
	Inclined	5-20° <5°
	Flat	
Anthropogenic	Permeable Impermeable	Man-made permeable
Man-Made Impermeable		
Current-Dominated		Channel

From Howes, Harper & Owen, 1994 Physical Shore-Zone Mapping

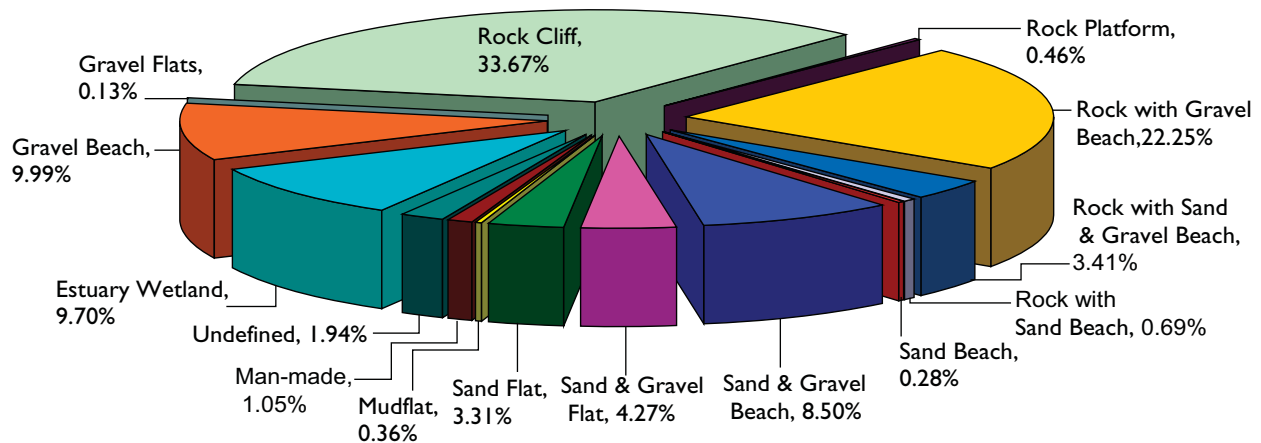
Through field surveys, recurring groupings of species were identified and classified according to the dominant cover species, for example barnacles and mussels or *Ulva* – green algae. These assemblages or biobands were further defined by the color banding and texture visible from aerial or ground surveys to enable systematic inventory of the entire coast.

The resulting data represents a systematic approach

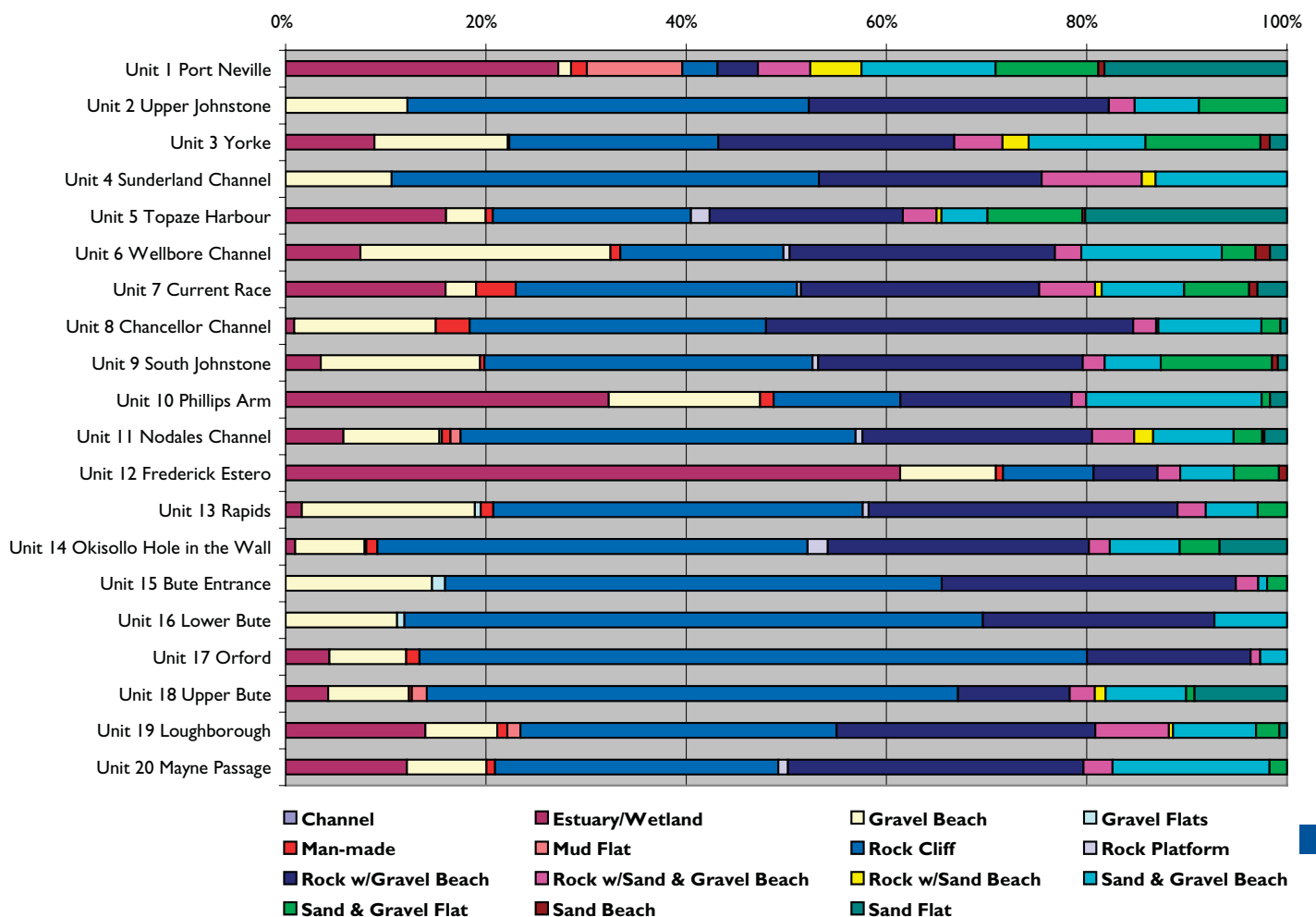
to evaluating the shore-zone, arguably the most heavily impacted aspect of the coastal environment. By comparing known impacts related to structures and specific uses, a consistent approach can be used for determining the suitability of shoreline development within a Planning Unit.

Shore type classification provides a basis for identification of rare or unique features.

**Figure 11.** Summary of Shore Types in Johnstone-Bute Plan Area as a percentage of total Plan Area shoreline



**Figure 12.** Planning Unit Shore Type Description





With uncommon features highlighted, it is possible to more closely examine them to assess their sensitivity to development or human activities. In some cases management provisions or recommendations for further conservation assessment may be appropriate.

Within the Plan Area shore types classified as rock cliffs encompass the largest percentage of shore type, accounting for just over 33% of the total shore length. Rock with gravel beaches accounts for over 21% while estuary wetlands make up 11.5% of the shore length (Figure 11).

A similar examination at the Planning Unit level highlights the unique characteristics of each unit. Figure 12 graphically displays the predominance of rock cliff and rock with gravel beach shore types throughout the Planning Units. Unit 1 - Port Neville provides an example of a diversified shore type structure having a complement of most of the shore types inventoried.

### 2.3. Marine Habitat

The Johnstone-Bute Plan Area consists of a diverse mixture of marine ecosystems that are unique to the coast of British Columbia. The marine habitat categories identified for the study area range from a deep fjord system to numerous constricted rocky passages with strong tidal flows. Marine habitat in the Johnstone-Bute Plan Area has been divided into five major categories based on physical attributes including depth, substrate, current, temperature, slope and subsurface relief (Table 3). The purpose of these categories is to identify common marine habitat characteristics that can be associated with dominant ecological attributes and ecological function. Habitat types within the Johnstone-Bute Plan Area include:

- Protected shallow inlets
- Low current channels and inlets
- High current channels and inlets
- Glacial fjord habitat
- Moderately deep inlets

The following is a physical description for each habitat category that details the characteristic ecological attributes and key habitat features as well as the primary ecological function associated with each category (Table 4). Also included is a description of the location and timing of habitat types utilized by key fish, shellfish and marine mammal species within the habitat categories

outlined for the Johnstone-Bute Plan Area. Many marine species utilize more than one habitat type during varying life stages and are therefore dependant on the sustenance of natural transient processes (i.e. nutrient cycling) that exist between them.

Strong tidal currents through constricted rocky passages characterize much of the marine habitat in the Johnstone-Bute Plan Area. These currents can significantly increase species richness in both lower shore and sub tidal areas. The current categories, based on maximum surface currents used in the habitat category descriptions, are as follows: very strong > 6 knots, strong 3-6 knots, moderately strong 1-3 knots, weak < 1 knot, very weak negligible. Wave exposure throughout the Plan Area is classified as low throughout, although Bute and Loughborough Inlets are subject to strong arctic outflow winds.

Salinity in the Plan Area is variable ranging between 18-28 ppt and therefore lower than open ocean conditions that range between 30-35 ppt. The variability in salinity along with sediment type is particularly important for determining community type in the upper reaches of estuaries and lagoons, such as the Estero Basin and upper Bute Inlet.

The information in this chapter is based on existing provincial datasets as well as habitat and species utilization data recently compiled (2003) by DFO through field work and personal interviews. The habitat profiles reflect “known” quantities of habitat attributes and verified biological use with the understanding that additional ecologically significant habitat or species utilization is likely to occur within the study area but has not yet been documented. Therefore the identification and utilization of marine habitat categories and biological features within these areas should be an ongoing process with new information incorporated and information revised as needed.

#### ■ PROTECTED SHALLOW INLET HABITAT ■

Protected shallow inlet habitat is characterized by low exposure and weak to negligible currents with substrates dominated by mud, sand and gravel (Table 3). Benthic summer water temperatures are generally warm (9-15C) with water depths ranging within the photic zone from 0 to 50 meters. Protected shallow inlet habitat within the Plan Area is uncommon and represents only 7.5% (62 km<sup>2</sup>) of the total study area. Protected inlet habitat includes Port Neville (Planning Unit 1), Topaze Harbour (Planning Unit

Table 3. Habitat Categories, Associated Physical Features, Ecological Attributes and Function

Habitat Category	Sub units	Area (% of Total)	Current	Water Depth (m)	Water temp	Dominant benthic substrate	Ecological Attributes and key habitat features <sup>1</sup>	Ecological Function
Protected shallow inlet	1-Port Neville 5-Topaze Hbr 10-Phillips Arm	62 km <sup>2</sup> 7.5%	Weak with except'n of lower Planning Unit 10 at 3 knots	Shallow to photic (0-50)	Warm (9-15C)	Mud and sand	Abundance of gravel, clam beaches and estuaries - 32% of wetland/estuary shore type and 10% of kelp forests.	Rearing habitat for larval and juvenile invertebrate and fish species in protected and productive estuarine habitat. 33% of total clam beaches at head of Port Neville and Phillips R. 57% crab habitat. Supports commercial crab and shrimp fisheries. Critical and over wintering habitat for marine and shorebirds. Utilized by pinnipeds and dolphins for feeding. Area supports nesting habitat for eagles.
Low current channels and inlets	4-Sunderland 8-Chancellor 11-Nodales 12-Fred Estero 15-Bute Entrance	127 km <sup>2</sup> 15.5%	Low to Mod-strong (1-3 knots)	Moderate (50-200 m)	Warm (9-11C)	Mud and sand	23.6% of estuary/wetlands 15% kelp forests, Limited (8%) clam habitat. Areas of concentrated food sources.	Major salmon migration corridor for Mainland stocks, secondary migration and holding for Fraser River stocks. Supports commercial shrimp, prawn, clam and urchin fisheries primarily in Planning Unit 4,8,15. Marine mammal utilization throughout with areas of intense use. Broad use by Orca for migration and feeding. Sensitive bird nesting sites including eagles and alids.
High current channels and inlets	2-Upper Johnstone 3-Yorke 7-Current-Race 9-South Johnstone 6-Wellbore Channel 13 Rapids 14-Okisollo 20-Mayne Pass	284 km <sup>2</sup> 34.6%	Strong (3-6 knots) to very strong (>6 knots)	Moderate (50-200 m) with isolated pockets of deep (>200 m)	Warm (9-11C)	Pre-dominantly mud and sand except rock in Planning Unit 13 and 35% of Planning Unit 14	High current areas that increase nutrient availability. Extensive canopy kelp beds, 25.5% estuarine habitat with highest proportion of rocky shorelines, islands and sub tidal reefs. Productivity increased by Gulf of Georgia Drift phenomenon. Unique sub tidal areas with gravel/cobble substrate	One of the most productive habitat categories in the Johnstone Bute Plan Area. Major salmon migration corridor for Fraser River stocks along Johnstone strait and mainland stocks along the easterly corridor. Critical feeding areas and migration corridor for marine and shorebirds, fish and mammals. Productive clam beds. Majority of canopy (75%) kelp habitat and 28% of clam habitat and 13% of crab habitat. Stocks support commercial prawn, shrimp, urchin fisheries in Planning Unit 6,9, 13,14. Highest concentration of marine mammals including dolphins, pinnipeds and whales (humpback, minke & sperm) with areas of specialized use by Orca. Highest concentration of pinniped haul out sites. Important nesting and feeding grounds for marine and shoreline birds. Isolated rubbing beaches for Orcas
Glacial fjord habitat	16-Lower Bute 17-Orford 18-Upper Bute	285 km <sup>2</sup> 34.6%	Moderately strong (1-3 knots)	Mostly Deep (200-700 m)	Pre-dominantly cold (<8C) ~50:50	Mud	Deep glacial inlet with tidal flows that cause nutrient rich upwelling currents. Subject to arctic outflow winds, limited estuarine habitat (only 4.6%). Marine productivity increased by Gulf of Georgia Drift phenomenon	Unique and significant biomass of krill and herring produced. 21% clam and 4% crab habitat. Productive clam beds and commercially important prawn, shrimp, clam and krill fisheries. Large runs of chum, pink, chinook and coho. Homathko supports one of 15 major eulachon stocks in BC. Areas of concentrated use by dolphins including Orca. Concentrated areas used by pinnipeds for feeding and haul out. Utilization by eagles for feeding and nesting. Refuge and rearing areas for marine and shoreline birds.
Moderately deep inlet	19-Loughborough	64 km <sup>2</sup> 7.8%	Weak (<1 knot)	Moderate (50-200 m)	Warm (10 c) to Cold (<8C)	Mud	Subject to strong outflow winds. 14% of shoreline type is estuary. Steep rocky shoreline.	Good crab production with 25% of crab habitat here. ~18% of herring spawn shore type and commercially important rockfish, prawn/shrimp producing area. Includes areas used by pinnipeds for feeding and haul out. Over wintering habitat for marine and shoreline birds

5) and upper Phillips Arm (Planning Unit 10).

Estuaries represent some of the most highly productive habitats in the coastal zone and are utilized by a wide range of species. A significant proportion of estuarine habitat is located within the “protected shallow inlet” habitat category with the highest proportion (32.3%) of the total shoreline type classified as estuary or wetlands. High value estuarine habitat can typically be found at the head of inlets, as well as along shoreline areas where small streams enter the ocean on low gradient beaches. Major estuaries are located at the head of Port Neville (231 ha) at the mouth of the Fulmore River and Shoal Creek as well as the head of Phillips Arm (127 ha). Estuarine habitat is typically associated with prime gravel beaches for clams with approximately 144 ha of clam beaches identified at the head of Port Neville and shoreline bays both sides of the inlet. Valuable clam beds (~138 ha) are also located at the head of Topaze Harbour as well as Read and Jackson Bays.

Estuarine habitat is also associated with highly productive salt marshes, sea grass beds, eelgrass beds and tidal flats. Estuaries typically have a low diversity of planktonic and benthic species that can tolerate fluctuating salinity regimes, but those species present tend to be abundant. This valuable and highly sensitive feature supports rearing habitat for numerous fish and invertebrate species. Intertidal sloughs and estuaries also provide over wintering habitat for ducks, geese, Trumpeter Swans and shorebirds.

Eelgrass (*Zostera marina* and *Zostera japonica*) is the main marine vascular plant in the Johnstone-Bute Plan Area. Provincial data for eelgrass habitat is not accurately mapped within the Johnstone-Bute Plan Area; however additional local and DFO data reflects that it tends to be distributed throughout the Plan Area. Eelgrass grows in underwater meadows or “beds”, rooted in a fine sand substrate. These beds are most commonly found in protected waters in the lower intertidal and shallow sub tidal zones and are common at the heads of many inlets. Eelgrass beds also play an important role in stabilizing the substrate. The size and shape of beds may change seasonally or between years. They are typically shallow rooted and easily dislodged by a range of human activities. Eelgrass plays an important role in primary production as well as for structural and

functional integrity of intertidal zones. Sea grasses contribute to primary production through photosynthesis and also serve as a food source to herbivores. Sea grasses also produce and release dissolved organic nutrients than can be absorbed directly by marine invertebrates. Eelgrass is also structurally important for providing substratum for micro algae and invertebrates as well as nursery habitat for juvenile salmonids and shellfish species. Another important function of sea grass is their well-developed root systems that trap sediment and nutrients and stabilize marine substrates. Valuable eelgrass beds are typically associated with estuaries provide herring spawning habitat and are recognized as critical fish habitat in the coastal ecosystem. DFO does not allow development that might destroy eelgrass beds to proceed unless it is shown that compensatory habitat will be created.

Mud and sand are the dominant benthic substrates and when combined with shallow water typical to protected shallow inlet habitat, supports over half (57%) of the known crab populations in the Plan Area. The predominant commercial crab species is the Dungeness crab (*Cancer magister*) with adults found to depths of 180 meters but is most abundant



**Photo 1.** Aerial view of the estuary habitat at the head of Port Neville, looking upstream at the Fulmore River that supports one of the few sockeye stocks in the Plan Area

Photo: Graham Winterbottom 2003



in water less than 90 m. Dungeness are most abundant in areas with sandy substrates and/or shallow waters with eelgrass. Significant crab habitat is located at the head of Port Neville and the mouth of the Phillips River.

Marine plant groups consist of the microscopic marine floating algae or “phytoplankton”, that provide the basis of the ocean food web. These minute, single celled plants are eaten by zooplankton that in turn are the food for fish, vertebrates such as herring, and invertebrates such as clams, sea anemones and other sea creatures. They are present in all of the marine and estuarine waters of the Johnstone-Bute area but proliferate in warm sheltered inlet habitat. Their abundance also varies seasonally with the availability of light and nutrients. When nutrients and light are optimal, high concentrations of phytoplankton known as “blooms” may occur and may color the water red, brown or green (e.g., “red tide”). Some species produce potent toxins that are liberated when the algae are eaten. Other species kill without toxins, such as species with serrated edge spines that lodge in fish gill tissues. In the case of shellfish, these blooms can be a seasonal public health hazard. Within the Plan Area, Topaze Harbour has poor circulation and stratification and is therefore susceptible to concentrated algal and zooplankton blooms.

Extensive canopy kelp beds can be found at the entrance to Port Neville (~106 ha) as well as the entrance to Topaze Harbour (61 ha) at Seymour Island, Poyntz Island and Termagant Point. The ecosystems associated with canopy kelp beds are highly productive and provide critical rearing and spawning habitat for many fish and invertebrate species.

#### ■ LOW CURRENT CHANNELS AND INLETS ■

The second habitat category identified for the Johnstone-Bute Plan Area is low current channels and inlets that represent 15.5% or 127 km<sup>2</sup> of the Plan Area. In these areas, the currents are generally less than 1 knot, but tidal currents can increase to 3 knots through narrow passages. Water depths are moderate, ranging from 50 to 200 m. Summer benthic water temperatures are warm (9-11 C), with substrates dominated by mud and sand. Planning units within this habitat category are Sunderland, Chancellor, Nodales, Frederick Estero and Bute Entrance. Shorelines areas are generally steep and characterized by rock with pocket sand and gravel beaches. Also included in this habitat category is the

unique feature of the Estero Basin where surface waters are brackish, but deep waters are believed to support rockfish and anchovies.

Overall, the estuarine values in this habitat category are low relative to the protected shallow inlet and high current channel and inlet categories. Although 23.6% of the shore type is classified as estuary/wetland habitat, most of the shoreline area lies within the unique Estero basin where the shoreline gradient is steep and therefore does not support typical estuarine habitat including eelgrass beds and shallow gravel/mud beaches. As expected, there is limited clam (7.7%) and no identified crab habitat within the low current channels and inlet category.

The low current channels in this habitat category are part of a primary migration corridor for Mainland adult and juvenile salmon stocks as well as a secondary migration route for Fraser River stocks. These channels also provide important ebb tide holding areas for all southbound migrants. The low current channels also provide migration routes for both adult and juvenile Pacific Herring.

Approximately 15% of the mapped kelp forest habitat is located within this habitat category, with major kelp beds along the shores of Hardwick and West Thurlow Islands. Smaller patches long the north side of Sunderland and Chancellor Channels, Termagant Point, Althorp Point and Shaw Point.

Bute Entrance provides an important rearing area for juvenile herring stocks and supports a significant biomass of euphysiids. It is suspected additional recruitment of juvenile herring, euphysiids and other species results from the combined effects of prevailing winds on surface currents from the Strait of Georgia during the late winter and early spring. This large biomass provides feed for a number of predators including salmon, rockfish, lingcod, and dogfish as well as marine birds and mammals.

#### ■ HIGH CURRENT CHANNELS AND INLETS ■

The high current channel and inlets habitat category is one of the most productive habitat types within the Johnstone-Bute Plan Area, and represents 35% (284 km<sup>2</sup>) of the total area (Table 3). Marine habitat in the high current and inlet habitat category is exposed to flood and ebb tide generated currents that increase nutrient availability and overall productivity in these areas. Rocky shelves lining the passages provide substrates for shellfish and kelp, that in turn provide rearing and feeding areas for salmonids, rockfish and

groundfish species. Another ecologically important aspect of this habitat category is the presence of mid channel and nearshore rocky islands and outcrops. These features increase the physical diversity and corresponding ecological complexity in comparison to steep rocky shorelines found elsewhere in the Johnstone-Bute Plan Area.

Water currents are typically strong, varying between 3 to 7 knots within the open channels. Higher currents occur through narrow passages including the Dent, Yuculta and Arran Rapids in the Rapids Planning Unit and the Hole in the Wall in the Okisollo Planning Unit, that reach an average current between 8-14 knots. Shoreline substrates are primarily rock cliffs, interspersed with sand and gravel beaches. Water depths are moderate ranging from 50 to 200 m with isolated pockets of deep (>200 m). Summer benthic water temperatures are warm ranging from 9-11 C with benthic substrate dominated by mud and sand with exception of rock substrates in the Rapids subunit and 35% of Okisollo Channel.

This habitat category includes 2 major migration corridors with Johnstone Strait running along the west side adjacent to Vancouver Island and another

passage along the Mainland corridor along the northeast side of the Johnstone-Bute Plan Area. The Johnstone Strait corridor includes the Upper Johnstone, Yorke, Current Race and S. Johnstone Planning Units and is utilized as an important migration, holding and feeding corridor for fish and marine mammals. Up to 90% of the Fraser River salmon stocks migrate through Johnstone Strait to their natal streams. Johnstone Strait also serves as an important navigation corridor and also supports significant commercial fisheries

The remaining Planning Units included in the high current channels and inlets habitat category are the Wellbore channel, the Rapids, Okisollo channel and Mayne Passage. These passages form part of the major migration and holding corridor for Mainland Coast salmon stocks and Pacific herring. These passages also provide secondary migration corridors for Fraser River stocks. Of particular ecological value is the Rapids Planning unit. The protected shoreline areas where large back eddies are created during the ebb tide act as natural fish traps and are utilized by fish and mammal species as important feeding areas and holding habitat. The large tides and resulting upwelling forces Hake carcasses to the surface as they cannot compensate for the change in depth and provide a food source for eagles and other bird species.

There is significant estuarine habitat interspersed within the high current channels. Valuable estuarine habitat is located at the head of shallow shoreline bays within the high current channel habitat category. There is a large (151 ha) estuary as well as notable clam beds (79 ha) located in Blenkinsop Bay. Similarly, the Salmon River has a large estuary (179 ha) and clam beds along the seaward border of the bay (36 ha). Smaller estuary and clam beds exist in Owen Bay and Chonat Bay in the Okisollo Planning Unit and Bessborough Bay in the Wellbore Planning Unit. A significant proportion of clam beds are located in this habitat category, with approximately 28% of the total clam beds within the Plan Area. The largest clam beaches are located at Blenkinsop Bay, Charles Bay, Chonat Bay, Salmon River and the at the head of Forward Harbour. Mud bottom subtidal habitat adjacent to productive estuaries at the Salmon River and Blenkinsop Bay support 13% of the known crab habitat within the Plan Area. Crab habitat has also been identified in Forward Harbour, Elk, Owen and Chonat Bays. Also often associated with estuaries is eelgrass bed habitat, and there is abundant eelgrass habitat observed in



Photo 2. Aerial view looking upstream into the unique Estero Basin that is part of the "low current channels and inlet" habitat category developed for the Plan Area

Photo: Graham Winterbottom 2003



**Photo 3.** Aerial view of rocky islands and islets with surrounding strong currents typical to the High Current Channels and Inlets  
Habitat Category Photo: Graham Winterbottom 2003

protected bays, but not yet mapped throughout the high current channels and inlet habitat category.

The majority (75%) of mapped canopy kelp beds are located within this high current channel and inlets habitat category. Canopy kelp beds are generally located along areas of upwelling or high current channels where nutrient levels are high and a rocky substrate is available. The kelp fronds are attached by a “holdfast” to rocky substrates and grow from the zero tide level, or just above, to about minus 12 meters depending on the water clarity. Kelp may grow on unstable substrates such as cobble, but beds tend to be less stable in such areas. The distribution of kelp forests is variable from year to year. Primary kelp beds are located in bands along rocky shoreline areas, in less than 40 feet of water with notable kelp in the vicinity of Neville Point, Yorke Island, Walkem Island, Helmcken Island (203 ha) and Peterson Islets in the Johnstone Strait. Isolated patches of kelp line both northern and southern sides of Johnstone strait as well as throughout the remaining passages within this habitat category. Significant kelp canopy forests are also located at the Midgham Islets, Carterer Point and Bulkely Island as well as additional smaller patches on both sides of the Wellbore Channel. In the Rapids Planning Unit, kelp forest habitat provides important rearing habitat at Dent Island and the Gillard Islands as well as along shoreline areas on the east side of West Thurlow Island and adjacent to Green Point Rapids in the Mayne Passage Planning Unit. Extensive kelp habitat is found throughout the Okisollo Planning Unit that totals approximately 260 ha, on both sides of the channel.



**Photo 4.** Aerial view of strong tidal currents in the Yuculta Rapids at Stuart Island (U13) that reach up to 14 knots through narrow rocky passages in the High Current Channels and Inlets habitat category Photo: Graham Winterbottom 2003

The moderately deep mud bottom habitat with this habitat category also supports a significant population of prawns and shrimp as well as crabs in shallower waters to support an important commercial fishery. The Okisollo Planning Unit has noted biological significance supporting significant stocks of rockfish, lingcod and dogfish with extensive surveys indicating a significant scallop biomass within the channel.

#### ■ GLACIAL FJORD HABITAT ■

The glacial fed deep inlet habitat category consists of Bute Inlet where the steep sided rock walls that border both sides of the inlet drop quickly to water depths that range between 200 to 700 m. The inlet is fed by glacial runoff, resulting in reduced surface salinity and a predominantly cold (<8C) summer benthic water temperature. Currents throughout the inlet are moderately strong and benthic substrates are dominated by mud. The entire inlet is subject to strong arctic outflow winds.

The biological productivity in Bute Inlet is unique and very high, with the deep, cold water producing a significant biomass of krill that are typically found in cold, deep offshore trenches of the Arctic and Antarctic. Krill are herbivores that live in enormous schools and serve as an important food source to fish, seabirds and baleen whales in addition to other marine mammals. It is suspected that the large tidal inflows at the entrance to Bute Inlet cause deep water upwelling that push the krill to shallower waters. This phenomenon is thought to be the reason for exceptional Euphasiids production and an overall concentration of feed in lower Bute Inlet. The prevailing southeasterly wind in Georgia Strait



thought to create a phenomenon identified as the Gulf of Georgia Drift may also be responsible for concentrating fish/invertebrate larvae in the lower Bute Inlet area. Larval herring mature and rear in the Bute Entrance and lower Bute area and out-migrate with the adult herring after they spawn in March and April. The combination of Euphasiids and herring draws a large number of predator species. Krill production is significant enough to support a commercial fishery within Bute Inlet.

Estuarine habitat is proportionally very limited within the deep inlet habitat category although the single largest estuary in the Plan Area is located at the mouth of the Homathko River at the head of the inlet. There is a smaller estuary located at the mouth of the Orford River. Clam production in these estuaries is significant, with approximately 21% of the total clam habitat within the Plan Area identified in this habitat category.

Of particular significance to the glacial fjord habitat category is the abundance of herring spawn habitat. Approximately 80% of the shoreline herring spawn habitat within the Johnstone-Bute Plan Area is located on both sides of the upper portion of Bute Inlet in Planning Unit 18. Shoreline habitat throughout the inlet also provides an important migration and rearing corridor for adult and juvenile salmonids and herring.

#### ■ MODERATELY DEEP INLETS ■

The moderately deep inlet habitat category is limited to Loughborough Inlet and represents a small proportion, 7.8% (64 km<sup>2</sup>) of the Johnstone-Bute Plan Area. The inlet is steep sided with moderate water depths ranging from 50 to 200 m. Water temperatures are variable with approximately a 50:50 ratio of cold (< 8C) in the upper inlet to warm (10C) in the lower inlet. Weak currents are characteristic in the protected moderately deep inlet habitat; the benthic substrate is dominated by mud. Although the inlets are protected from high wave exposure from oceanic conditions, they are susceptible to moderate wave exposure from localized outflow winds.

The overall proportion of estuarine habitat in Loughborough Inlet is low with only 14% of the estuary shore type located within this habitat category. There are 2 major estuaries at the head of Loughborough Inlet at Frazer Bay and McBride Bay that total approximately 90 ha. Within these estuaries, there are important clam beaches (84 ha)



**Photo 5.** Upstream aerial view of prime estuarine habitat at the mouth of the Homathko River located at the head of Bute Inlet  
Photo: Graham Winterbottom 2003

near the mouth of the Stafford and Apple Rivers. Approximately 10% of the total clam beaches that have been mapped are located in Loughborough Inlet.

Protected inlet habitat provides critical feeding areas and migration corridors for fish as well as marine mammals and birds. Inlet waters also provide critical habitat for prawns, crabs, sea urchins and sea cucumbers. Loughborough Inlet provides the second highest amount of crab habitat, having approximately 25% of the total crab habitat mapped for the Plan Area, with significant populations in Beaver Inlet/Sidney Bay and Cooper Reach.

## 2.4. Biological Features

Following is a description of known key marine species including shellfish, finfish, marine mammals and marine birds resident to the Johnstone - Bute Plan Area. The purpose of this section is to provide a brief overview of the known biological values typical to the Johnstone - Bute Plan Area. This information provides baseline information regarding the presence and distribution of the most documented marine species within the Plan Area. Also included is a description of the location and timing of habitat types utilized by key fish, invertebrate, bird and mammal species within the habitat categories outlined for the Plan Area. This information may assist decision makers in determining suitable marine development activities within the study area. It is important to note that the ecological integrity of marine systems can also be largely affected by resource development activities such as logging and road construction on adjacent terrestrial areas, which is outside the context of this chapter.

**Table 9. Seasonal Utilization of Known Habitat Categories by Marine Mammals**

Marine Mammal Species	Habitat Categories & Associated Planning Units (M=known migration route; F=known feeding grounds; H=known haul-out sites)				
	Protected Shallow Inlet	Low Current Channels and Inlets	High Current Channels and Inlets		Moderately Deep Warm Inlet
<b>Planning Unit</b>	1,5,10	4,8,11,12,15	2,3,7,9,6,13,14,20		16,17,18
<b>Sperm whale</b>			MF (13)		MF (13)
<b>Humpback whale</b>			MF (3)	MF (3)	MF (3) MF (3)
<b>Minke whale</b>		MF (4,11)	MF (7,9)		
<b>Orcas</b> (Resident & Transient)	MF (1,5)	MF (all)	MF (all)		F (all)
<b>Other Delphinids</b> (porpoises & dolphins)	MF (1,5)	MF (4,11)	MF (2.3.6.7.9.14.20)		F (all)
<b>Pinnipeds</b> (sea lions & seals)	FH (1,5)	FH (4,12,15)	FH (all)		FH

Spring	Summer	Fall	Winter	Year round	No data
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Note: This table illustrates general trends by species and variations will occur outside the seasonal timing windows listed above. For more species specific locations within the Planning Units, refer to text or maps

water's surface, or close to the shore in inlets, channels, or exposed areas. Steller's sea lions feed mainly on fish such as hake, herring, Pacific cod, rockfish, and salmon, but squid, octopus, and crustaceans are also eaten. Both harbour seals and northern sea lions are known to travel up major rivers in pursuit of anadromous fish. Known haulout sites for Steller's sea lions are located at Yorke Island, Murray Island, Vere Cove, Helmcken Island, Walkem Islands, Edith Point, Arran Rapids, Jimmy Jud Island, Hole in the Wall, Bute Inlet and Mayne Passage.

#### ■ RED AND BLUE LISTED SPECIES ■

A number of locations in the Plan Area provide habitat for red- or blue-listed marine birds, mammals, and plants. The red- and blue-list classification is given by the provincial government to species that are considered by scientists to be at risk due to declining populations or habitats as the result of human activities. Red-listed species are those which are extirpated, endangered, or threatened, or are in danger of becoming so. Blue-listed species are classed as vulnerable because they are especially sensitive to human activities or natural events. Red and blue listed marine species in the Plan Area are shown in Table 10.

## 2.5. Social and Economic Profile

### ■ COMMUNITY ■

The Plan Area is within the Comox Strathcona Regional District (CSRD), electoral Area J. Area J is geographically larger than the Plan Area and includes Quadra Island, which accounts for a large proportion of the electoral area's population. The Plan Area also includes the asserted traditional territories of the Xwémalkwu, Klahoose, Tlowitsis, Kwiakah, Comox, We Wai Kai and We Wai Kum First Nations.

The Plan Area is sparsely settled. The largest population concentration within the Plan Area is the incorporated Village of Sayward, located on Vancouver Island. Localities as defined by BC Statistics include the islands of East and West Thurlow, Port Neville and Stuart Island; the populations of these islands largely vary seasonally. There are also a number of First Nations Reserves within the Plan Area, most of which do not have permanent residents.

Census information (i.e. population and other demographic data) is not available for a geographical unit that exactly matches the Plan Area. The closest geographic boundaries correspond to two dissemination areas, plus Sayward and the Indian reserves. The 2001 Census for these units totals 518 persons. Except for population data, all other Census information (e.g. age, income, etc.) for the

**Table 10. Red and Blue listed species in the Johnstone-Bute Plan Area**

Species	Status	Location in Plan Area	Habitat
<b>Vascular Plants</b>			
Henderson's Checker-mallow ( <i>Sidalcea hendersonii</i> )	BLUE	Sayward	Marine Near shore
<b>Fish</b>			
Eulachon ( <i>Thaleichthys pacificus</i> )	BLUE		Marine Near shore, Estuaries
<b>Birds</b>			
Western Grebe ( <i>Aechmophorus occidentalis</i> )	RED	Bute Inlet, Nodales Channel, Phillips Arm, Topaze Harbour	Marine
Brandt's Cormorant ( <i>Phalacrocorax penicillatus</i> )	RED	Bute Inlet	Marine, Near shore
Double-crested Cormorant ( <i>Phalacrocorax auritus</i> )	RED	Bute Inlet, Port Neville	Marine, Near shore
Pelagic Cormorant ( <i>Phalacrocorax pelagicus</i> )	RED	Port Neville	Marine, Near shore
Great Blue Heron ( <i>Ardea herodias</i> )	BLUE		Intertidal, Terrestrial Lowland
Surf Scoter ( <i>Melanitta perspicillata</i> )	BLUE	Bute Inlet, Sunderland Channel	Marine, Near shore
Long-tailed Duck ( <i>Clangula hyemalis</i> )	BLUE	Sunderland Channel, Bute Inlet, Johnstone Straits, Phillips Arm	Marine, Near shore
California Gull ( <i>Larus californicus</i> )	BLUE		Marine, Intertidal
Common Murre ( <i>Uria aalge</i> )	RED	Nodales Channel, Cordero Channel	Marine
Marbled Murrelet ( <i>Brachyramphus marmoratus</i> )	RED	Bute Inlet (Orford, Paradise, Southgate, Teaquahan, Homathko, and Bear watersheds), Johnstone Strait	Marine, Terrestrial Lowland
Ancient Murrelet ( <i>Synthliboramphus antiquus</i> )	BLUE		Marine
Trumpeter Swan ( <i>Cygnus baccinator</i> )	BLUE	Johnstone Strait, Bute Inlet	Estuaries
<b>Mammals</b>			
Killer Whale ( <i>Orcinus orca</i> )	RED	Johnstone Strait	Marine
Northeast Pacific Resident Population			
Killer Whale ( <i>Orcinus orca</i> )	BLUE	Johnstone Strait	Marine
Northeast Pacific Offshore Population			
Killer Whale ( <i>Orcinus orca</i> )	RED	Johnstone Strait	Marine
West Coast Transient Population			
Steller's Sea Lion ( <i>Eumetopias jubatus</i> )	RED	Johnstone Strait	Intertidal

Source: Conservation Data Centre, 2003

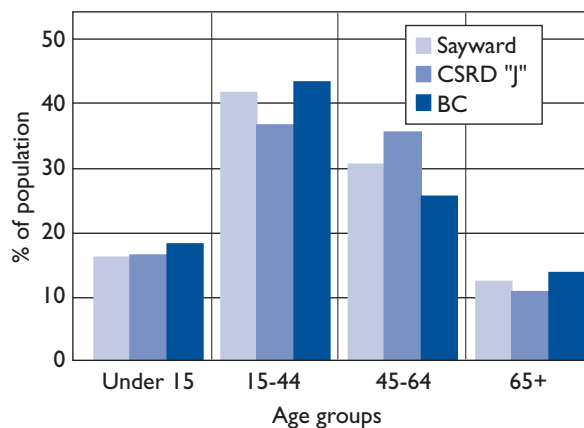
dissemination areas and the Indian reserves are suppressed for confidentiality concerns. Complete Census information is available for Sayward and Area J, which may provide some indication of the Plan Area's socio- economic trends. It is also noted that the Census population is recorded for one's "normal place of residence". For instance, persons seasonally working in the Plan Area are not included in the Plan Area's Census count.

Between 1996 and 2001, the Plan Area's population appears to have declined. The CSRD also experienced a decline (at -1.6% between Census dates) over this interval, but in percentage terms the population reduction for the Plan Area was much larger (judging from the trends of Sayward and Area J). In comparison, the provincial population increased almost 5% over the interval.

The median age (i.e. the age that divides the total population in two equal halves) of the Plan Area population is slightly older than the provincial median. The median age for Sayward is 41.6, and 43 years for Area J, compared to a median age of 38 years for the provincial population. Relative to the provincial age profile, the Plan Area is relatively over-represented by the 45-65 age groups. This age profile

is typical of rural areas lacking services and infrastructure of importance to the younger and older members of the population.

Sayward was incorporated in 1968 and is the Plan Area's only municipality. It is located one hour north of Campbell River and two hours south of Port McNeill/Port Hardy on Highway 19. While the population of the community is some 400 persons, the population of the Sayward Valley is about 1,200. The forest industry (logging, silviculture, and transportation) is the mainstay of the local economy. The relatively recent closures of the Eve River logging

**Figure 14. Age profile comparison of plan area and BC**

Source: 2001 Community Profiles, BC Statistics

operation and the Kelsey Bay log sort have negatively impacted the economy, and have perhaps contributed to the population loss. Tourism (i.e. food and accommodation) also supports local employment.

A recent assessment of Sayward's tourism potential identified its access to Johnstone Strait and Discovery Passage as "strength" for the industry. "Opportunities" pertinent to the coastal zone include re-development of the log sort area, wildlife viewing in the Salmon River estuary, and development of lodges/resorts at Brown Bay and Race Points. The results of this study are summarized in Table 15. Kelsey Bay is the only small craft harbour between Campbell River and Port McNeill. Campbell River serves as the regional centre for services not available in Sayward (e.g. high school, hospital, airport, bank and retail outlets).

### ■ FIRST NATIONS ■

The Plan Area includes the traditional territories of the Xwémalhkwu, Klahoose, Tlowitsis, Kwiakah, Comox, We Wai Kai and We Wai Kum First Nations.

#### *The Xwémalhkwu (Homalco) First Nation*

The traditional territory of the Xwémalhkwu First Nation extends from Call Inlet to include Thurlow, Sonora and Stuart Islands, Phillips Arm, and Bute Inlet. Historically, its villages were adjacent to Calm Channel throughout Bute Inlet up to Southgate and Homathco rivers and in the Discovery islands, Waiatt Bay, Small Bay and Maurelle Island. Presently, the Nation's main community is I.R. 9 in Campbell River. The Nation has 9 reserves totaling some 620 hectares in or near the Plan Area. The Nation is in the process of implementing the addition of Lot 1835, an area of approximately 56 hectares, to the Church House Indian Reserve. These are located in Bute Inlet, Homathko River, Sonora Island and Calm Channel. Total band population is estimated to be 477. The most populated reserve (approx. 222 persons) is in Campbell River. The Xwémalhkwu First Nation entered the treaty process in December 1993, and is now in Stage 4 of the six-stage process, negotiating an agreement in principle.

The Xwémalhkwu First Nation's economic activities in the Plan Area presently include forestry, eco-tourism and commercial shellfish harvesting. Traditional harvesting of marine and land resources is carried out throughout the traditional territory which incidentally makes up a large part of the Johnstone-Bute Plan Area. The Xwémalhkwu are moving forward with plans to harvest and manage forestry

tenures within the traditional territory. Homalco Wildlife Tours is a band-operated company in its third year of operation providing tours called, "The Bears of Bute". The focus of the operation is developing and promoting the Orford Bay and surrounds in Bute Inlet for bear viewing and cultural tourism. Visitors to the site come from all over the world. Relatively rapid sales growth is expected in the next several years and diversification and expansion of the enterprise is envisioned.

The Xwémalhkwu First Nation is actively researching various sustainable economic development options, including shellfish tenures, tourism opportunities, renewable energy developments, and timber and non-timber forestry development activities occurring on the traditional territory. Research is being completed to identify the current status of the aquatic and forestry resources to assess the respective potential for economic development. The Xwémalhkwu First Nation's mandate is to assert title and jurisdiction on the traditional territory and to develop initiatives and partnerships in resource and tourism development activities occurring in the territory. Of particular note is the fact that Chief and Council have strong concerns regarding the potential impacts of open net cage aquaculture to the marine environment in the traditional territory, especially Bute Inlet. The Xwémalhkwu First Nation supports use of the precautionary approach in aquaculture and other resource developments. The Xwémalhkwu also support cooperation and collaboration with neighbouring First Nations, local governments and non governmental organizations. To this end the Xwémalhkwu First Nation has negotiated protocols with the District of Campbell River, Regional District of Comox Strathcona, the Georgia Strait Alliance and looks forward to the completion of negotiation of shared jurisdiction and planning protocols with neighbouring First Nations.

#### *The Nations of the Hamatla Treaty Society*

The Hamatla Treaty Society was formed in 1994 as the administrative body of the Laich-Kwil-Tach K'omoks Tlowitsis Council of Chiefs. Its mandate is to negotiate a fair and equitable treaty for the member Nations. The member Nations are the K'omoks, Kwiakah, Tlowitsis, Wei Wai Kai, and the Wei Wai Kum First Nations. Their collective asserted traditional territory includes the entire Plan Area. Three of the member bands have reserves in the Plan Area. The Tlowitsis First Nation has two reserves near



Port Neville totaling 110 hectares. The Kwiakah has reserves in Phillips Arm and just north of Stuart Island totaling some 69 hectares. The Wei Wai Kum First Nation has three reserves in the Plan Area, two in Loughborough Inlet and one within Cordero Channel. The three reserves total about 63 hectares. The, K'ómoks and We Wai Kai First Nations have no reserve lands located within the Plan Area although have asserted traditional territory within the Plan Area.

The Treaty Society's band member population is 2,055 persons with most members residing in the Campbell River-Comox area. The Tlowitsis First Nation has 342 band members, living in Campbell River and Alert Bay. The Kwiakah First Nation has 21 band members (September 2003) mostly living off-reserve. The Wei Wai Kum First Nation has 598 band members. The band membership of the We Wai Kai First Nation is 845. Population statistics were not available for the K'ómoks Nation.

The Hamatla Treaty Society holds a timber sale licence with an annual allowable cut of 25,000m<sup>3</sup> and a five-year term. The government's objectives for this timber sale licence are to encourage participation of the Hamatla Treaty Society or its member Nations, in the management of forest resources, and provide employment and/or training opportunities in the harvesting and forestry sectors. A limited partnership of the five member bands (Leqwa Enterprises) will manage the forestry operations. In addition to forest industry activities, bands have, and are investigating, opportunities in tourism and aquaculture industries.

## 2.6. Economic Structure and Trends

### ■ INCOME AND LABOUR FORCE ■

Census data on income and employment is not available for the Plan Area because of the small population size. It would appear that the Plan Area median income is below the provincial average as this is the case for Sayward and Area J.

Labour force information for Campbell River is reported here to generally reflect that of the Plan Area. Forestry operations, aquaculture and some tourist operators that are active in the Plan Area have offices in Campbell River. The unemployment rate for Campbell River in 2001 was 12.7% and Sayward 13.8% compared to a provincial rate of 8.5%.

The distribution of the labour force by industry is one indicator of the area's economic make-up.

Relative to the provincial profile, the Campbell River labour force has a higher proportion of workers associated with primary industries, such as forest harvesting, commercial fishing, aquaculture, mining and agriculture. Manufacturing, mostly saw and pulp mills, accounts for a significant proportion of the labour force activity. In Sayward the bias towards forestry and farm employment was even more dramatic, these two sectors accounted for 31% of employment, fully 10 times the provincial average

Another perspective of the local economy is a measure of income dependency. In this analysis, basic income is defined as revenue coming into the area and dependent income is the re-spending of this basic income within the defined region. The analysis associates the dependent income with the corresponding basic activity to provide a clearer picture of the area's "economic drivers". While the findings are based on 1996 data the information is still instructive. For the analysis, the Campbell River area includes Tahsis and Gold River as well as Sayward. The Bute area includes Quadra and Cortes Island. For Campbell River, there is a very high dependency on the forest industry. In relative terms, the Bute area economy is diversified, depending about equally on fishing, tourism, public sector, and transfers.

## 2.7. Economic Activities

### ■ AQUACULTURE, COMMERCIAL FISHING AND WILD HARVESTS ■

Favourable water temperature, protected waters and good infrastructure make the Plan Area attractive for aquaculture development. Presently there are six companies operating 22 finfish aquaculture tenures in

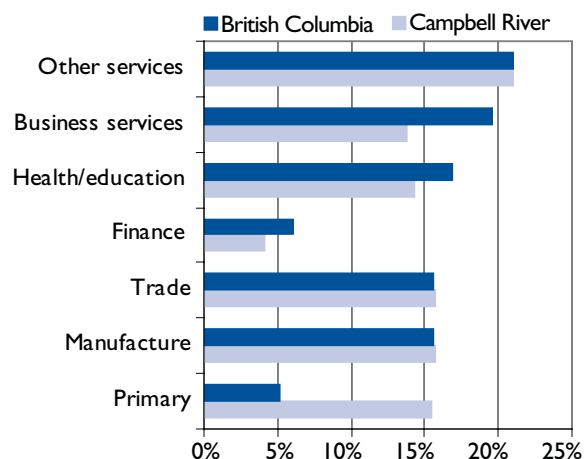


Figure 15. Experienced labour force by industry

Source: 2001 Canada Census



the Plan Area. Atlantic salmon and chinook salmon are the primary species, as well as coho and steelhead trout; black cod is also being explored.

The majority of sites are focused within the lower portion of the Plan Area, around Nodales and Okisollo Channels. Based on industry interviews and other information, the tenures support about 50-60 full time equivalent positions on-site. Additional off-site employment is supported at the three processing plants in the area as well as the various supporting businesses which supply services and material to the aquaculture industry. In 2002, the value of harvested farm salmon exceeded \$36 million.

Currently there is only one commercial shellfish tenure within the Plan Area. However, First Nations and private companies have intentions to explore potential sites.

Wild salmon and a wide variety of other shellfish are harvested in the Plan Area. With respect to salmon, the sockeye and chum harvest accounted for most of the landed value in 2003. Prawns, clams and crabs account for a large proportion of the other wild harvest. In 2003, the total landed value of salmon and other marine species was \$6.8 million in DFO Area 13, which includes, but is somewhat larger than the Plan Area.

### Clams

Clams are harvested commercially within the Plan Area from intertidal areas during low tides using rakes and hand picking methods. The three main species harvested are the Manila, butter and littleneck clams. Manila and littleneck species make up the majority of the harvest due to higher prices and a stronger market. Johnstone Strait is one of the key harvest areas for littleneck and Manila clams. Area 13 catch statistics for the 2003 clam fishery represent a landed value of \$265,488. Although a relatively small fishery, it is important to coastal communities and provides employment to many people. Clams are also a traditional food source for First Nations and are

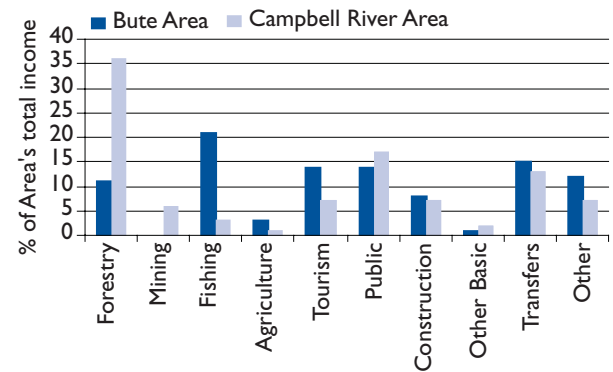


Figure 16. Income dependency 1996

Source: BC Statistics 1996

widely used in the recreational fishery. Populations of Manila and littleneck clams within the Plan Area are located in Cameleon Harbour on Sonora Island as well as Forward Harbour, Blanch Point, Hemming Bay, Big Bay and Thurston Bay.

### Crabs

Dungeness crabs are the second most valuable invertebrate fishery on the west coast of Canada although the Plan Area is not considered to be a major crab fishing area. The commercial crab fishery operates mainly from September to December and March to June and is managed by DFO through size and sex limitations and seasonal closures. The fishery uses traps or ring nets on long lines set from boats in estuaries or in relatively sheltered coastal waters. Catch statistics from DFO indicate a landed value of \$238,789 for Area 13. Important commercial crab areas are found in Cooper Reach, Orford River, Paradise River, Gray Creek, Phillips Arm, Beaver Inlet/Sidney Bay, Grassy Creek, Moh Creek, Owen Bay, Blenkinsop Bay, Chonat Bay and Elk Bay.

### Geoducks

Geoducks are harvested commercially throughout the year and the fishery is one of BC's most valuable. Landings from the inside waters have declined slightly since 1987. The majority of the commercial fishery takes place outside of the Plan Area. Catch statistics for Area 13 indicate 302kgs were taken from

the area in 2002, representing a value of \$6373. Fisheries were not held in Area 13 in 2003 or 2004. The total allowable catch for 2005 is set at 2,000 lbs.

**Table 11. Aquaculture Production in the Johnstone-Bute Coastal Plan Area 1999-2002**

Year	Harvest (Tonnes)	Farmgate Value (\$,000)	Species Harvested	# of sites with harvest	# of sites with no harvest	Total Sites Reporting
1998	3,176	18,812	Atlantic, Chinook, Oysters	8	8	16
1999	4,759	27,984	Atlantic, Chinook, Oysters	8	8	16
2000	*	*	Atlantic	4	12	16
2001	*	*	Atlantic	9	7	16
2002	10,927	36,460	Atlantic, Chinook	8	10	18

\* Confidential - fewer than three companies reporting harvest. Source: BC MAFF Seafood Development 2004

The fishery is managed on a three year rotational basis using a constant catch strategy where quotas are set based on a 1% annual exploitation rate of the virgin biomass. Individual beds are grouped by DFO management areas. Over time smaller beds are grouped together and the number of management areas has increased in order to spread out fishing efforts and to reduce the potential for over harvesting.

Most of the productive beds in the south coast have been explored whereas areas in the north coast of BC are still being discovered. The precise location of geoduck fishing areas is maintained in confidence by DFO.

### *Prawns and Shrimp*

Prawns are the largest and most lucrative of the Pacific coast shrimp species and are commercially fished using traps set from boats, in waters 55 to 90 meters deep with a rocky substrate. The fishery occurs from May until early July throughout the BC coast with the majority of the catch coming from southern coastal waters. Licences within inshore areas are deemed to be fully subscribed, with some opportunity to expand into offshore waters. Over 90% of the commercial catch is frozen at sea and destined for the Japanese market while the remaining live product is landed from day vessels operating in southern coastal areas close to local markets. Catch statistics indicate the prawn fishery to be the second highest value fishery in Area 13 with a value of \$1,907,409. Important prawn areas in the Plan Area are Bute Inlet, Loughborough Inlet, Chancellor Channel, Sidney Bay/Beaver Inlet, Cordero Channel, Okisollo Channel and Small Inlet.

The direct commercial harvest of shrimp is discouraged by DFO due to limited information about stocks and distribution; most of the catch is taken incidentally in the prawn fishery.

### *Scallops*

Pink and Spiny scallops are harvested commercially within the Plan Area through both dive and trawl methods. In 1999 the fishery was discontinued due to the lack of management controls. In 2000 an experimental dive fishery was initiated by DFO in order to obtain information to develop a biologically based management plan. Experimental licences within the Plan Area are currently restricted to Okisollo Channel within Area 13-8 to 13-12. Historically 95% of the dive scallops landings have

come from fishery areas south of Area 13 for a total landed value of \$38,973.

### *Sea Cucumber*

**Table 12. Commercial Salmon and Shellfish Catch Statistics: Area 13, 2003**

	2003 Landed weight(lb's)	2003 Value \$
Chinook	1,596	7,145
Chum	2,545,729	1,798,011
Pink	500,815	154,503
Sockeye	497,050	2,000,496
<b>Salmon Total</b>	<b>3,545,190</b>	<b>3,960,155</b>
Clams	67,478	265,488
Scallops	7,820	38,973
Geoduck	302 (2002)	6,318 (2002)
<b>Shellfish Total</b>	<b>75,600</b>	<b>310,779</b>
Crabs	31,239	238,789
Octopus	5,573	17,370
Prawns	148,504	1,907,410
Shrimp	11,375	21,219
Sea Cucumber	51,849	77,054
Sea Urchin	42,843 (green only)	180,820
Plankton (euphausiids)	13,567	16,451
Herring (spawn on kelp)	21,563	194,075
<b>Other Species Total</b>	<b>326,513</b>	<b>4,802,288</b>

Source: DFO Commercial Salmon and Shellfish Catch Statistics Area 13 (includes south of the Plan Area to Cape Mudge) [http://www.pac.dfo-mpo.gc.ca/sci/sa/Commercial/Summaries/AnnualReports/Annual03\\_user.htm](http://www.pac.dfo-mpo.gc.ca/sci/sa/Commercial/Summaries/AnnualReports/Annual03_user.htm) Note geoduck fishery on a 3 year rotation, no fishery in Area 13 2003, 2004

Sea cucumbers are harvested by divers during autumn and winter and are also an important food resource to First Nations. Under the current DFO management strategy the fishery is restricted to a three to four week period during the months of October and November. Commercial fishing for sea cucumber occurs in south coast portions of the Plan Area, with landed values of \$77,054 in 2003 for Area 13. Currently the central and north coasts support the majority of the fishery.

### *Sea Urchin*

Both Green and Red Sea Urchins are harvested within the Plan Area primarily between November and March and the Plan Area is identified as a core fishing area for green urchins. Catch statistics indicate 94,454 lbs were taken from Area 13 during 2003, valued at \$180,820. DFO plans to allow the harvest to expand under an exploratory protocol in order to gather scientific information regarding the fishery. First Nations utilize urchins for food, social and ceremonial purposes. Important commercial urchin areas include Wellbore Channel East, Green Point Rapids, Graveyard Point to Bear Point and Rock Bay to Palmer Bay.

## Forestry

Presently the Crown forest land is under the management direction of the Sunshine Coast Forest District (administering forest land in Bute Inlet) and the Campbell River Forest District. Industry gains access to the Crown timber under various forms of forest tenures, commonly area-based tree farm licences (TFL) and various types of volume-based (i.e. not area specific) forest licences. The Plan Area has a history of extensive logging activity and much of the Crown timber of the Plan Area upland is currently under tree farm licence.

Timber harvesting began in the early 1900s along the coastline and moved inland as technological innovations allowed. Now, harvesting is done by conventional methods and by helicopter. There are no manufacturing facilities in the Plan Area. Most of the harvest is destined for mills located in Campbell River or mill sites in the Georgia Strait Basin.

Pertinent to the coastal plan is the industry's requirement to access the foreshore and navigable waters for dumping, sorting, storing and eventually transporting logs to de-watering sites. Water sites are also required for helicopter drops and to moor floating camps. There are numerous foreshore sites in the Plan Area used by the industry. Actual site utilization varies from currently used, intermittently used, potential future use or abandoned. The Plan Area's waterway is also a key marine transportation corridor for the forest industry. Logs are transported through the Plan Area to southern mills, as well as forest products moving to final offshore markets.

An indicator of the economic significance of forest harvesting adjacent to the Plan Area was estimated based on a typical volume in an average year that would be delivered to the Plan Area foreshore for water storage and transport (annual volume was estimated by proportioning AAC timber harvesting land base in unit or reviewing recent harvest history). The quantitative estimates are intended to illustrate the magnitude of the economic activity and provide a general understanding of its significance. It is not a precise estimate. The total volume of logs harvested adjacent to the Plan Area is estimated at 1 million cubic metres per year.

Average economic coefficients are applied to this volume and provide measures of the economic contribution. This volume supports some 575 full time equivalent positions at the harvesting stage.

Probably a significant number of these persons reside in the Campbell River area. Assuming the wood flow is similar to the regional flow, about 30% of the mill employment is in and around Campbell River with the remainder occurring further south. The gross value of the logs and government stumpage revenue is estimated using average values.

Looking to the future, based on the most recent timber supply analyses for the TSA's and the TFL's, available harvest volume is expected to be relatively stable over the next few decades.

The province's coast forest industry is facing a number of challenges and these are clearly affecting operations in Johnstone - Bute. Nevertheless, the relatively low cost of marine storage and transportation of logs, goods and products is an important competitive advantage to operators within the Johnstone-Bute area.

## ■ TOURISM AND RECREATION ■

The Plan Area contains a variety of attractive features that draw visitors. This includes highly scenic areas, relatively abundant aquatic and terrestrial wildlife resources, wilderness quality and secure anchorages. Bute Inlet is one of the longest fiords on the BC coast and offers considerable tourism potential.

Along the shorelines of the tidal channels bounded by Stuart and Sonora islands and the mainland there is a concentration of commercial and private lodge

**Table 13. Estimated annual harvest in the Plan Area**

Management Unit	Approximate Annual Volume <sup>1</sup> (m <sup>3</sup> )	Licence Holder
Sunshine Coast TSA; Bute Inlet	280,000	forest licences
Strathcona TSA; Loughborough Supply block	130,000	forest licences
TFL 47; Johnstone Strait Supply Block, Thurlows, Hardwicke, Sonora islands, Philips Arm and Port Neville	400,000	Timberwest Ltd.
TFL 45; Philips Arm, Fredrick Arm, and east end of West Thurlow	80,000	International Forest Products
TFL 43: Homathko River head of Bute Inlet	22,775 of cottonwood	Scott Paper Limited
TFL 39: Block 5 between Bute and Loughborough Inlets	95,000	Weyerhaeuser Company Ltd.
TFL 25: head of Loughborough Inlet (block 2)	92,000	Western Forest Products Ltd.

<sup>1</sup> annual volume was estimated by proportioning AAC timber harvesting land base in unit or reviewing recent harvest history

facilities with approximately 10 public resorts and private lodges located here. In the remainder of the Plan Area, there are several small marine oriented lodges (e.g. operators on Cordero Channel and Mayne Passage), and some facilities near Sayward.

The Stuart Island area has historically offered a superior salt water salmon fishing experience. This is still the primary draw for most visitors. There is growing participation in “eco-tourism” experiences, such as wildlife viewing, cultural tourism, kayaking, and hiking. The Xwémalkwu “Bears of Bute” program is representative of such initiatives. Visitors access Stuart Island and the Plan Area generally, by private boat, water taxis, jet boat, float plane and helicopter. A large proportion of the clientele to the Stuart Island lodges arrive by air. The several private lodges have substantial investments in buildings and infrastructure and cater to their invited guests.

The operating season for the lodges is normally May to the end of September. The proportion of the visitors that are BC residents varies by business, but discussions with operators indicate the industry average is probably about 20%.

An estimate of the economic activity associated with the tourism industry in the Plan Area is challenging because the “industry” is not self-organized, there is a diversity of “products”, and the reliance on the Plan Area to support the product/business varies greatly among operators and products. An informal survey of Plan Area tourist operators was conducted to provide a preliminary indication of this significance.

Broadly, the industry is composed of lodge/resorts that offer food and accommodation and often contract independent guides for fishing and other day excursions by air and boat, and independent fishing guides and guide outfitters. The private lodges do not operate on a commercial basis. Nevertheless, they support economic activity by providing seasonal employment and purchasing goods and services.

Based on the findings of the informal interviews and application of the “lodge” building blocks to portray the private lodges, tourism spending in a recent year is estimated to be at least \$14 million. The public and private lodges/resorts (primarily in the Stuart Island area) account for about 80% of this total. There are at least 200 seasonal jobs, or about 100 fulltime equivalent positions directly associated with this activity.

The industry’s view of its future prospects is positive. There is the expectation that the eco-tourism product will continue to grow in popularity. Demand for this product may be boosted since funding has been secured for the construction of a cruise ship dock within Campbell River. Annually Alaska bound cruise ships transit the area some 500 times carrying approximately 1 million people. The Plan Area is accessible and offers an attractive adventure excursion to this potential market for 4-6 hour excursions. As noted earlier, First Nations are expecting to develop tourism based business. In the short term, there is concern that fish conservation restrictions (i.e. to protect rockfish populations) may negatively impact the salt water fishing product.

The economic impact of the self-guided recreational sector is more challenging to identify. Recreational users include both local residents and visitors. Where statistics are available, recreational users are typically included within the broader tourism sector, making it difficult to identify linkages between users and their economic impacts. The Outdoor Recreation Council commissioned a study<sup>1</sup> in 2003 in an effort to more accurately quantify the value of recreation to the local economies of central and north coast BC. The Johnstone-Bute Plan Area comprises the southern extent of the report’s study area and consequently provides some indication as to the contribution of the recreational sector to the economy of Johnstone-Bute communities and those immediately adjacent. Within the Central Coast sub area (includes Johnstone-Bute), wildlife/nature viewing was the most popular activity, followed by saltwater fishing, boating and kayaking. Saltwater fishing represented the highest revenue generator among marine recreational activities followed by boating and kayaking. Across the Central Coast, these activities are estimated to have generated over \$5 million annually across the central coast sub area. More specific to the Johnstone-Bute Plan Area the DFO Georgia Strait creel survey recorded about 40,000 “boat trips” annually during the past three years. Chinook salmon accounts for most of the recreation user’s harvest. Using projections similar to those identified in the Outdoor Recreation Council report, this figure is roughly equivalent to \$1.5 million in annual revenue/expenditures in the Johnstone-Bute area alone. The scope for expansion within the

<sup>1</sup> Economic Impact Analysis of Outdoor Recreation on British Columbia’s Central Coast, North Coast and Queen Charlotte Islands/Haida Gwaii December, 2003. Vancouver Outdoor Recreation Council of BC



**Table 14. CCLRMP Candidate Protection Areas**

Candidate Protection Areas (CCLRMP)	Unit	Area (upland)	Significant Tourism and Recreation Features
<b>Forward Harbour</b>	6	409ha	One of the safest anchorages along the Inside Passage route Pink salmon, chum and Coho runs Popular sport fishing spot Head of harbour important for waterfowl Cultural significance Scenic views
<b>Philips Estuary</b>	10	1,068ha	High use by fish and grizzly bears Cultural significance Wildlife viewing opportunities
<b>Stafford Estuary</b>	19	538ha	High fisheries values Seasonal grizzly use Rare plants nearby Moderate use by waterfowl
<b>Thurston Bay Extension</b>	11	202ha	Good anchorage Existing trail system High visual quality High tourism and recreation use and potential Cultural values
<b>Yorke Island</b>	3	38ha	Recreation priority for the Central Coast Historic artillery site WWII Critical anchorage site along Inside Passage High tourism use and potential
<b>Gillard/Jimmy Judd Islands</b>	13		*Description to come*
<b>Estero Basin</b>	12	2322ha	Opportunities for remote backcountry recreation and tourism activities from adjacent communities, resorts and cruise ships High estuary/wetland values and biodiversity associated with fish and wildlife habitats present in the area Conservation of special features: Representation of outer Fjord land ecosection

tourism industry and for recreational users varies by sector but is seen to be generally positive.

Tourism and recreational values exhibit varied resiliencies to nearby development. Much of this is related to personal preferences; while one fisherman is unconcerned about anything but whether the fish are biting, another's experience may be profoundly impacted by visual and noise considerations associated with some forms of development. Certainly, for some sectors, environmental conditions are primary considerations for users and/or clientele seeing a 'pristine wilderness' experience. As a consequence, the ideal separation distance between different marine uses can vary considerably and has proven to be an issue of some contention between different marine sectors.

There are two provincial parks and a number of forest service recreation sites in the Plan Area. The Rock Bay Marine Park is at the junction of Discovery Passage and Johnstone Straits. It consists entirely of foreshore. Activities supported at the site include scuba diving, fishing, boating, paddling and wildlife viewing. No visitation statistics are reported.

A private campground operates near the park. Thurston Bay Provincial Marine Park is located on the northwest side of Sonora Island. The park provides sheltered anchorage and recreational opportunities for boaters traveling the popular Inside Passage. Access to the park is by boat only. Activities supported by the park include swimming, fishing, hiking and paddling. In August 2000, 136 parties (i.e. about 430 persons) visited this park.

The Plan Area upland is within the area being assessed in the Central Coast Land and Resource Management Plan Area. The CCLRMP identified a number of candidate protected areas in the planning area, identified in Table 14.

The province has conducted Tourism Opportunity Studies (TOS) at a broad scale to identify sustainable tourism based development on the North Island and mainland coast. Study areas were based on Forest District boundaries; two studies identified Strengths, Weaknesses, Opportunities and Threats (SWOT) in portions of the Johnstone-Bute Plan Area. The Sunshine Coast TOS includes Bute Inlet and Stuart Island, while the Campbell River & Port McNeill



Forest District TOS includes the District of Sayward. A summary of the SWOT analysis for the regions within the Plan Area are presented in Table 15.

### ■ MINING ■

Relatively high mineral potential for metals and industrial minerals exist over a narrow northwest trending belt traversing Loughborough Inlet, Phillips Arm and some of the Thurlow islands. There are presently no operating metals mines. The area has seen a number of small gold producers, most of them located close to tidewater. All the mines were short lived. Valid mineral tenures are clustered in Phillips Arm, the east shore of Loughborough Inlet, north of Estero Basin, and at the head of Bute Inlet. Some exploration activity was recorded in the area in the late 1990's.

### ■ MARINE TRANSPORTATION ■

The waterways of the Plan Area are essential for commercial marine traffic and the economic activities of the Plan Area. Due to the limited road access, much of the timber harvested within the Plan Area is floated and barged to mills in the Campbell River area and Lower Mainland. The waters are also used extensively by recreational boaters traveling the inside passage route and frequenting the many protected anchorages. The commercial fishing fleet utilizes a large portion of the Plan Area during specific timeframes for the harvest of both fish and invertebrates using methods such as troll, trawl, net and a variety of traps.

Locations within Okisollo Channel, Stuart Island, Blind Channel and Kelsey Bay provide marine services such as wharves, gas facilities and lodging. The activities of the commercial fishing fleet, towboats and recreational boaters within the Plan Area require safe anchorages in bays and inlets protected from storms and unfavorable tides. Several *Land Act* Notations of Interest for Boat Havens and Towboat Reserves provide such opportunities within the Plan Area.

Johnstone-Strait and Discovery Passage is a main route for cruise ship traffic traveling up the coast. Due to these narrow waterways the vessels are limited in their navigational abilities and travel specific routes that require a wide berth.

**Table 15. Summary of Tourism Opportunity Studies  
SWOT Analysis for Sayward District,  
Bute Inlet and Stuart Island**

Sayward and District	
<b>Strengths</b>	<ul style="list-style-type: none"> <li>• Outstanding karst formations.</li> <li>• Abundance of accessible lakes.</li> <li>• Proximity to Mt. Cain.</li> <li>• Marine access to Johnstone Strait and Discovery Coast.</li> </ul>
<b>Weaknesses</b>	<ul style="list-style-type: none"> <li>• Lack of tourism infrastructure</li> <li>• Lack of accommodation</li> <li>• Lack of industry cooperation</li> <li>• Small pool of trained labour</li> <li>• Tourism operators from outside region</li> <li>• Under-representation by TVI</li> <li>• Lack of access to marketing resources</li> <li>• ALR land, TFL forest in most of region</li> </ul>
<b>Opportunity</b>	<ul style="list-style-type: none"> <li>• Recreational caving</li> <li>• Caving interpretive centre</li> <li>• Tourist caving (Newcastle, White River, Nimpkish Lake)</li> <li>• BC Ferries travel markets</li> <li>• Hiking trail network</li> <li>• Freshwater fishing- steelhead</li> <li>• Water skiing</li> <li>• Family rafting (Salmon River)</li> <li>• Link with Campbell River and North Island tourism products</li> <li>• 4X4/ATV touring</li> <li>• Different use of log sort area if/when closes</li> <li>• Wildlife viewing (Salmon River estuary)</li> <li>• Campgrounds (Woss Lake)</li> <li>• Lodge/resorts (Brown Bay, Race Points)</li> <li>• Snowmobiling</li> <li>• Train bikes</li> <li>• Artisans</li> <li>• Scuba Diving</li> <li>• Ski touring (Mt. Cain and Schoen Lake Provincial Park)</li> <li>• Hiking tours linking water features</li> </ul>
<b>Threats</b>	<ul style="list-style-type: none"> <li>• Tax base threatened by log sort closure</li> </ul>
Bute Inlet	
<b>Strengths</b>	Spectacular views of peaks and hanging glaciers. Bear Viewing
<b>Weaknesses</b>	High winds and lack of suitable camping areas or anchorages
<b>Opportunity</b>	Viewing opportunities associated with the bears and Discovery Islands
<b>Threats</b>	Compromise of scenic values
Stuart Island	
<b>Strengths</b>	Numerous high recreation features (anchorages, rapids, estuaries, waterfowl, marine mammals, views, lodges and fueling stations)
<b>Weaknesses</b>	Primarily marine access. No public transportation
<b>Opportunity</b>	Hut systems for kayakers and boaters. Shuttling services
<b>Threats</b>	None identified

Source: Sunshine Coast Tourism, Public Recreation and Commercial Recreation Study 2002  
, Tourism Opportunities Study for Portions of the Campbell River and Port McNeill Forest  
Districts 2000

thought to create a phenomenon identified as the Gulf of Georgia Drift may also be responsible for concentrating fish/invertebrate larvae in the lower Bute Inlet area. Larval herring mature and rear in the Bute Entrance and lower Bute area and out-migrate with the adult herring after they spawn in March and April. The combination of Euphasiids and herring draws a large number of predator species. Krill production is significant enough to support a commercial fishery within Bute Inlet.

Estuarine habitat is proportionally very limited within the deep inlet habitat category although the single largest estuary in the Plan Area is located at the mouth of the Homathko River at the head of the inlet. There is a smaller estuary located at the mouth of the Orford River. Clam production in these estuaries is significant, with approximately 21% of the total clam habitat within the Plan Area identified in this habitat category.

Of particular significance to the glacial fjord habitat category is the abundance of herring spawn habitat. Approximately 80% of the shoreline herring spawn habitat within the Johnstone-Bute Plan Area is located on both sides of the upper portion of Bute Inlet in Planning Unit 18. Shoreline habitat throughout the inlet also provides an important migration and rearing corridor for adult and juvenile salmonids and herring.

#### ■ MODERATELY DEEP INLETS ■

The moderately deep inlet habitat category is limited to Loughborough Inlet and represents a small proportion, 7.8% (64 km<sup>2</sup>) of the Johnstone-Bute Plan Area. The inlet is steep sided with moderate water depths ranging from 50 to 200 m. Water temperatures are variable with approximately a 50:50 ratio of cold (< 8C) in the upper inlet to warm (10C) in the lower inlet. Weak currents are characteristic in the protected moderately deep inlet habitat; the benthic substrate is dominated by mud. Although the inlets are protected from high wave exposure from oceanic conditions, they are susceptible to moderate wave exposure from localized outflow winds.

The overall proportion of estuarine habitat in Loughborough Inlet is low with only 14% of the estuary shore type located within this habitat category. There are 2 major estuaries at the head of Loughborough Inlet at Frazer Bay and McBride Bay that total approximately 90 ha. Within these estuaries, there are important clam beaches (84 ha)



**Photo 5.** Upstream aerial view of prime estuarine habitat at the mouth of the Homathko River located at the head of Bute Inlet  
Photo: Graham Winterbottom 2003

near the mouth of the Stafford and Apple Rivers. Approximately 10% of the total clam beaches that have been mapped are located in Loughborough Inlet.

Protected inlet habitat provides critical feeding areas and migration corridors for fish as well as marine mammals and birds. Inlet waters also provide critical habitat for prawns, crabs, sea urchins and sea cucumbers. Loughborough Inlet provides the second highest amount of crab habitat, having approximately 25% of the total crab habitat mapped for the Plan Area, with significant populations in Beaver Inlet/Sidney Bay and Cooper Reach.

## 2.4. Biological Features

Following is a description of known key marine species including shellfish, finfish, marine mammals and marine birds resident to the Johnstone - Bute Plan Area. The purpose of this section is to provide a brief overview of the known biological values typical to the Johnstone - Bute Plan Area. This information provides baseline information regarding the presence and distribution of the most documented marine species within the Plan Area. Also included is a description of the location and timing of habitat types utilized by key fish, invertebrate, bird and mammal species within the habitat categories outlined for the Plan Area. This information may assist decision makers in determining suitable marine development activities within the study area. It is important to note that the ecological integrity of marine systems can also be largely affected by resource development activities such as logging and road construction on adjacent terrestrial areas, which is outside the context of this chapter.

## ■ FINFISH SPECIES ■

### Salmon

For several centuries, salmon have been of key importance to the people of the Plan Area. In earlier times, salmon was the staple food of the First Nations, as well as a key trade item and remains to be an important part of the daily diet of both First Nations and other local residents. Salmon abundance sparked a fishing and cannery boom across the area, beginning in the late 1800s. Although stocks have dramatically declined, the salmon resource continues to support commercial, recreational and First Nations food fisheries in the Plan Area.

There are approximately 30 documented salmon producing systems in the Johnstone-Bute Plan Area, ranging from small Order 1 coho producing streams to extensive, Order 5 or 6, glaciated river systems like the Homathko River. All 5 Pacific salmon species: chum (*Oncorhynchus keta*), pink (*Oncorhynchus gorbuscha*), chinook (*Oncorhynchus tshawytscha*), coho (*Oncorhynchus kisutch*) and sockeye (*Oncorhynchus nerka*) salmon are produced in the Johnstone-Bute Plan Area. Also produced within the study area are Steelhead trout (*Oncorhynchus mykiss*), rainbow trout (*Oncorhynchus mykiss*), cutthroat trout (*Oncorhynchus clarki clarki*) and Dolly Varden char (*Salvelinus malma*).

Chum and pink are the primary salmon species produced in the Johnstone-Bute Plan Area. Major chum producing systems include the Homathko, Southgate and Orford River systems that are located in Bute Inlet as well as the Heydon River in Loughborough Inlet. The majority of chums are considered fall run stocks that migrate into their natal streams by mid October. The Orford chum stock is one of the primary summer run chum stocks and enters the river by mid August. Major pink producing systems are more geographically widespread and include the Phillips River, Wortley River as well as the Apple, Stafford and Heydon Rivers in Loughborough Inlet. Mainland pink stocks return to the Plan Area on an even year cycle and many pink stocks are exhibiting a declining trend in escapement.

Discrete populations of lake and stream spawning sockeye stocks are produced in the Phillips, Heydon and Fulmore River systems and represent some of the few sockeye producing rivers on the Mainland Coast. The Fulmore River stocks are considered to have

conservation concerns expressed by DFO and management actions are in place to sustain migration routes to the river.

Significant stocks of chinook and coho are also produced in the Plan Area with significant populations produced in the Phillips, Homathko, Orford, Southgate, Apple and Read River watersheds. Additional coho stocks are likely produced in small but significant undocumented creeks throughout the Plan Area. DFO has expressed a conservation concern for declining Mainland coho stocks.

Salmon are produced throughout the Johnstone-Bute Plan Area, with chum and pink fry entering the marine environment during the first spring after emergence. Chinook, coho and sockeye smolts generally out-migrate to the estuarine areas in the spring, after spending up to one year rearing in freshwater. Both chinook and coho stocks within the Plan Area illustrate a life history variation where the fry rear in freshwater for one extra year, resulting in the out migration of a larger smolt with typically a higher survival rate. Salmon fry and smolts generally disperse and rear in protected habitat, after which some species migrate to offshore areas to feed as sub adults for 2 to 4 years (Table 4). Spawning migration into inlet habitat within the Plan Area primarily occurs during the late summer and fall, with an exception being Heydon River sockeye that return by early June. Due to the additional year of rearing in freshwater, some coho spawners return as large (20 lb), 4 year old fish, rather than the average 3 year old mature coho. Similarly, some chinook stocks stock return as 6 year olds rather 4 or 5 year old spawners. The majority of Mainland chinook are large, white fleshed stocks with exception of the unique Phillips River chinook that return as 6 year old, red fleshed fish.

The major stocks of concern in the Johnstone-Bute Plan Area include mainland pink and coho stocks as well as rare lake and stream spawning sockeye stocks in the Phillips, Heydon and Fulmore River systems. Management actions to address conservation concerns on these stocks include a "Ribbon Boundary" along the mainland side of Johnstone Strait that extends 0.5 miles offshore from Cracroft point on West Cracroft Island to the Brougham Point on East Thurlow Island. Commercial fishing is restricted from the shoreline area from the end of July to the middle of September to minimize interception of migrating Mainland stocks during that period. The mortality of incidental species has

been reduced in the commercial fishery through an increase in live recovery from the seine fishery well as through reduced set times and live release by the gillnet fishery.

### Ground fish

Key groundfish species in the Plan Area include halibut (*Hippoglossus stenolepis*), lingcod (*Ophiodon elongatus*) and rockfish. Between November to January, Pacific halibut spawn in deep waters (275 to 400 m) within the Johnstone-Bute Plan Area. First age of reproduction in females ranges between 8-12 years and females can produce 2 to 3 million eggs each year that are released into the water column (free-spawning). The eggs and larvae are pelagic for 4-5 months and typically live at depths of 100-200 meters. The larvae are carried by surface currents and settle onto sand/gravel substrates at approximately 6-7 month of age. As the juveniles mature, they migrate to deeper water, with adults living most commonly at depths between 55 and 422 m. Halibut are a commercially important species harvested within the Johnstone-Bute Plan Area and also make a significant contribution to the sport and First Nations fisheries.

Lingcod typically inhabit shallow rocky reefs, marine shelves and rock walls primarily in the low and high current channels and inlets habitat categories in the Johnstone-Bute Plan Area. For the most part, lingcod inhabit water depths ranging from 10 to 100 m. Lingcod are largely non-migratory and live up to 20 years. First age of reproduction is 3-5 years (70-76 cm) for females and 2 years (46-51 cm) for males, with spawning activity taking place from December to March in shallow water (Table 4). The males guard the nest and fan the eggs until they hatch in March/April with larvae remaining pelagic until late May/early June. The juveniles settle in shallow, flat rock bottom habitat and move to deeper waters as they mature. Lingcod are commercially harvested primarily by the trawl fishery but are also captured through the hook and line fishery along with rockfish.

Rockfish typically inhabit rocky reefs, marine shelves and rock walls throughout the Johnstone-Bute Plan Area. Some species of rockfish inhabit deeper waters and live in schools near the bottom to depths up to 366 m. Rockfish are harvested commercially by the nearshore hook and line fishery as well as the trawl fishery. Declining rockfish stocks have resulted in

implementation of a DFO rockfish conservation strategy, with rockfish conservation areas established along the coast in areas of rockfish habitat. Proposed DFO Rockfish Conservation Areas within the Plan Area include Phillips Arm including Fanny Bay, eastern portion of Planning Unit 3 Yorke, Forward Harbour (Planning Unit 6), Loughborough Inlet including Cooper Reach, Planning Unit 16 Lower Bute on NE shore of Stuart Island and north from Lawrence Pt, entire Orford Planning Unit 17 and the entire upper Bute Planning Unit

Groundfish species are important for commercial, recreational and First Nation food fisheries and are fished commercially in higher current passages with rock substrates within Planning Units 6, 7, 8, 10, 13, 14, 15 and 20.

### Herring

The Johnstone-Bute Plan Area provides important migration, spawning and rearing habitat for Pacific herring (*Clupea harengus pallasii*) stocks. Herring begin to migrate into the Plan Area during October, with the area population increasing until spawning in February and March. Herring mature at 3-4 yrs of age, with each female laying approximately 20,000 eggs annually. The eggs are deposited on shoreline vegetation including algae and eelgrass in the intertidal and shallow sub tidal zones, primarily in semi-protected areas during March and April and hatch in approximately 2-3 weeks. Larvae are pelagic and survival rates are significantly higher if the larvae remain in protected nearshore habitat. As mentioned previously, the Gulf of Georgia Drift phenomenon may result in the accumulation of larval and young herring in the Bute Entrance Planning Unit. By summer, the schooling young herring rearing in shallow water of bays and inlets are near kelp forests. After their first fall, juvenile herring typically migrate to areas of deeper water in the Plan Area. Herring have been known to remain year round in lower Bute Inlet and rear for up to 4 years. Herring typically mature at 3 or 4 years and migrate inshore in the fall in preparation to spawn in the spring.

The single largest herring spawn habitat within the Johnstone-Bute Plan Area is located at the head of Bute Inlet. This area alone represents 80% of total documented shoreline herring spawn habitat. Another major herring spawning site is located at the head of Loughborough Inlet where an additional 18% of shoreline herring spawn habitat has been identified.



**Table 4. Utilization of the Habitat Categories for Salmon and Selected Ground Fish Species**

Species	Protected Shallow Inlet		Low Current Channels and Inlets		High Current Channels and Inlets		Glacial Fjord	Moderately Deep Warm Inlet
Planning Unit	1,5,10		4,8,11,12,15		2,3,7,9,6,13,14,20		16,17,18	19
Salmon	Adult migration and spawning throughout the Plan Area.							
Juveniles	Rearing smolts throughout Plan Area from spring to fall				Rearing smolts throughout Plan Area from spring to fall		Rearing smolts throughout Plan Area from spring to fall	
Sub Adult	Sub adult marine phase (1-3 yrs)							
Ground Fish								
Halibut	Pelagic in 5	Larvae	Pelagic in 4,8	Larvae and 15	Pelagic in 3,6,7,9	Larvae 14,20		
	Young adults throughout							
Lingcod	Spawn December to March							
	Planktonic larvae from March to June							
	Juvenile and adults on reef habitat in 5		Juvenile and adults on reef habitat in 4,8,11,15		Juvenile and adults on reef habitat in 2,3,6,7,9,13,14,20		Juvenile and adults on reef habitat in 17,18	
Rockfish	Juvenile and adults on reef habitat in 5,10		Juvenile and adults on reef habitat in 4,8,11 @ Channel Is., 15		Juvenile and adults on reef habitat in 2,3,6,7,9,13,14,20		Juvenile and adults on reef habitat in 16,17,18	Juvenile and adults present
Herring			Pelagic larvae through spring and summer in Planning Unit 15				Pelagic larvae through spring and summer	Pelagic larvae through spring and summer
			Schools of rearing juveniles in Planning Unit 15				Rearing juveniles throughout	Rearing juveniles throughout
	Adult migration and spawning throughout the Plan Area.							
	Very small magnitude of herring spawning in SU1		Small magnitude of spawn activity in 11		Small magnitude of spawn activity in 6,13,14		Large (80%) magnitude of herring spawn activity (March and April)	Moderate (18%) magnitude of herring spawn activity (March and April)
			Important Adult and juvenile shoreline migration corridors		Important Adult and juvenile shoreline migration corridors		Important Adult and juvenile shoreline migration corridors	
	Important shoreline rearing and juvenile migration corridor. Sizeable year round population in Planning Unit 15 and 16							
Spring	Summer	Fall		Winter		Year round		No data

Note: This table illustrates general trends by species and variations will occur outside the seasonal timing windows listed above. For more specific locations within the Planning Units, refer to text or maps.

The remaining small (2%) but still important herring spawning areas include Beaver Cove, Granite Point, Phillips Arm, Douglas Bay, Chonat Bay, Hewitt Point, Orford Bay and Harding Island.

Herring is an important food source for a wide range of predators including delphinids, pinnipeds, fish species and some whales. Herring supports an important commercial fishery in the Plan Area. Currently there are three major commercial herring fisheries: spawn on kelp, winter food and bait and special use bait. The spawn-on-kelp fishery is

primarily conducted by First Nations to develop product destined for the large Asian market.

#### *Eulachon*

The Homathko River is one of only 15 major eulachon producing systems along the BC coast. Eulachon (*Thaleichthys pacificus*) spawn in larger rivers and migrate offshore to feed for 2 to 5 years before returning to spawn, generally from mid-March to mid-May. They are culturally important species and a highly regarded food fishery for First Nations. Eulachon are an important food source for other



marine fish, mammals and birds at various stages of their life cycle. Within their range of Northern California to the Bering Strait eulachon are produced in a total of only 30-40 rivers, with approximately 15 of them located in BC. Spawning areas tend to have distinct spring floods and glacial headwaters.

Eulachon are classified as a “blue-listed” fish species and are considered to be highly sensitive to human development activities and natural events that could affect their productivity. Since 1994, declines in eulachon runs have been noted. Although the exact causes of the decline are unknown, changes in habitat, the warming of the ocean climate, increased marine mammal predation and by-catch from offshore trawl fisheries are all cited as contributing factors.

## ■ SHELLFISH AND INVERTEBRATES ■

The Plan Area contains a variety of shellfish and invertebrate species that are harvested for commercial, recreational and First Nations use. Only the predominant shellfish species are discussed, with the understanding that additional shellfish species including northern abalone and weathervane, rock and pink spiny scallops are in lower or unknown abundances throughout the Plan Area.

### *Euphasiids*

Euphasiids, also known as krill, are large free swimming, shrimp-like crustaceans that are commonly found in large aggregations that can extend for several kilometers. Euphasiids are typically produced in the Arctic and Antarctic waters, but are also produced in the cold nutrient rich upwelling waters of Bute Inlet within the Johnstone-Bute Plan Area. They constitute an integral part of the food chain and are an important food source for a variety of marine fauna, including hake, herring, rockfish, salmon, seabirds, and whales. Both the nauplius larvae and adults are pelagic.

Euphasiids only occur in Bute Inlet although historically a population once existed in Loughborough Inlet. Bute Inlet currently supports a commercial fishery for krill which are harvested with fine-meshed plankton trawl nets towed just below the surface.

### *Prawns and Shrimp*

Both prawns and shrimp occur throughout the Johnstone-Bute Plan Area. Seven species of shrimp are found in Plan Area waters and generally inhabit rocky bottom habitat. Prawns (*Pandalus platyceros*) are the largest and most commercially lucrative of the

Pacific coast shrimp species. They are primarily bottom dwellers, and prefer sloped, rocky substrates between 75 and 150 meters. Mature shrimp breed in the late autumn to early winter. Developing eggs are carried on the swimmerets of female shrimp until hatching in the spring. The newly hatched “zoëa” larvae metamorphose through a number of stages and swim freely as zooplankton for approximately 3 months before settling to the bottom to mature further (Table 5).

Major shrimp and prawns stocks are produced in Bute Inlet, Loughborough Inlet, Chancellor Channel, Topaze Harbour, Phillips Arm, Sidney Bay/Beaver Inlet, Cordero Channel, Okisollo Channel and Small Inlet (Table 5). Prawns support a commercial fishery in Wellbore Channel, Mayne Pass, Rapids and Okisollo Planning Units as well as in Bute and Loughborough Inlets. Shrimp are also commercially harvested in Topaze Harbour, Phillips Arm, Sunderland channel, Chancellor, Wellbore Channel and Bute Entrance.

### *Intertidal Clams*

Intertidal clams within the Plan Area include the native littleneck clam (*Protothaca staminea*) and introduced manila clam (*Tapes philippinarum*). Clams release gametes into the water column from April to September and the larvae settle and young clams burrow into the substrate. Littleneck clams can grow to approximately 30 mm in 3 years off the BC coast.

Clam beaches are spread throughout the Plan Area, but are most abundant where mixed substrates of gravel, sand, mud and shells are found in the middle and low intertidal zones of protected shoreline areas and estuaries (Table 5). Sizeable clam harvesting areas are located at the head of Port Neville, Blenkinsop Bay, Topaze Harbour, (Head, Read and Jackson Bays), Salmon River, Phillips R, Stafford R and Apple R estuaries, Charles Bay, Owen Bay and Chonat Bay in Okisollo Pass, Bessborough Bay and the head of Forward Harbour. Clams support a commercial fishery in the Yorke, Wellbore Channel and Chancellor Planning Units.

### *Crabs*

The predominant commercial crab species in the Plan Area is the Dungeness crab (*Cancer magister*) with adults found to depths of 180 meters but is most abundant in water less than 90 m. Dungeness are most abundant in areas with sandy substrates and/or shallow waters with eelgrass. Adults mate between

April to September, and females can store sperm for several months. Most females carry eggs from November through February, and eggs hatch and larvae progress through 5 pelagic zoeal stages over the next 3 to 5 months followed by a final megalops stage (Table 5). Like many other invertebrate species, their larval life stage is spent as zooplankton within the upper 20 m of the water column, thereby providing an important food source to herring, pilchards and salmon. Metamorphosis of the larvae into their adult form occurs in the spring and crabs are sexually mature in 1.5 years.

Dungeness crabs are usually fished by trap and are highly valued for commercial fishery as well as recreational and First Nation fishery purposes. Important commercial crab areas within the Johnstone-Bute Plan Area include Cooper Reach,

Orford River, Paradise River, Gray Creek, Phillips Arm, Beaver Inlet/Sidney Bay, Grassy Creek, Moh Creek, Owen Bay, Chonat Bay, Elk Bay and Waddington Harbour (Table 5).

#### Sea Cucumbers

There are a number of sea cucumber species in the Johnstone-Bute Sound area, although the giant red (California) sea cucumber (*Parastichopus californicus*) is the largest and the only one commercially harvested. It is found from the intertidal zone to 250 meters, on a variety of substrate and current conditions. Sea cucumbers spawn between June and August by way of broadcast fertilization. Eggs are fertilized in the water column and planktonic larvae (auricularia) feed and develop for approximately 70 days before metamorphosis. Sea cucumbers typically attain sexual maturity within 5 years. Sea cucumbers

**Table 5. Seasonal utilization of habitat categories by shellfish species**

Species	Protected Shallow Inlet	Low Current Channels and Inlets	High Current Channels and Inlets	Glacial Fjord	Moderately Deep Warm Inlet
<b>Planning Unit</b>	1,5,10	4,8,11,12,15	2,3,7,9,6,13,14,20	16,17,18	19
<b>Prawn/Shrimp</b>	Free swimming larvae during spring and summer	Free swimming larvae during spring and summer	Free swimming larvae during spring and summer	Free swimming larvae during spring and summer	Free swimming larvae during spring and summer
	Prawns and shrimp in Planning Unit 5,10	Prawns in Planning Unit 4,8,11,12,15 Shrimp in 4,8,15	Prawns in Planning Unit 2,6,13,14,20 Shrimp in 6	Prawns throughout Shrimp in 16,17	Prawns and shrimp throughout
Bottom dwelling adults present year round and most abundant at depths between 75 to 150 m					
<b>Crabs</b>	5 planktonic zoeal stages in the upper 20m of the water column				
	Crabs produced in typically less than 90 m throughout	Small population of crabs produced at the head of Planning Unit 12	Crabs produced in Planning Unit 3,6,9,14	Crabs produced at Oxford Bay	Crabs produced at Sidney and George Bays, Beaver Inlet and the head of Inlet
<b>Clams</b>	Free swimming larvae April to Sept throughout	Free swimming larvae April to Sept throughout	Free swimming larvae April to Sept primarily in Planning Unit 3,6,7,14 (min), 20	Free swimming larvae April to Sept throughout	Free swimming larvae April to Sept throughout
	Adults in coarse sand/mud/gravel substrates in protected or semi-protected middle to low intertidal areas at head of bays and estuaries.				
<b>Sea Urchines</b>	Adults typically inhabit the lower intertidal and shallow sub title zones on rocky shores with moderate to High wave action.				
	At entrance to Planning Unit 1	Planning Unit 8,11,15	Planning Unit 2,3,7,9,13,14,20	Planning Unit 16,17	
	Adults spawn in later winter/early spring				
<b>Euphasida</b>				Resident population of Krill produced in Bute Inlet	
<b>Spring</b>	<b>Summer</b>	<b>Fall</b>	<b>Winter</b>	<b>Year round</b>	<b>No data</b>

Note: This table illustrates general trends by species and variations will occur outside the seasonal timing windows listed above. For more species specific locations within the Planning Units, refer to text or maps

are harvested by divers, usually during autumn and winter, and have been a historically important food resource to First Nations. Sea cucumbers are harvested commercially in the Chancellor, Bute Entrance, Lower Bute and Orford Planning Units.

### Sea Urchins

Three species of sea urchins: red (*Strongylocentrotus franciscanus*), green (*S. droebachiensis*) and purple (*S. purpuratus*) are represented in the Plan Area. Urchins graze on attached or drift seaweed and kelp and have a specialized jaw consisting of five articulating teeth that allow them to reduce plant material. Urchins are often found in aggregations and their combined feeding efforts have been known to remove large quantities of kelp beds. Urchins typically spawn between January and March, during their second year when they reach 25 mm in diameter. The planktonic larval stage lasts between 2 to 4 months (Table 5). Green sea urchins occupy intertidal areas down to 140 m and are known to migrate seasonally between deep and shallow water. Green sea urchin populations have been rebuilding in the Plan Area. Red sea urchins occupy rocky substrates in shallow sub tidal waters with moderate to strong currents, typically to depths of 50 m. Sea urchins are harvested commercially in the Chancellor, Bute Entrance, Lower Bute and Orford Planning Units. Other important urchin producing areas include Wellbore Channel East, Green Point Rapids, Graveyard Point to Bear Point and Rock Bay to Palmer Bay.

### ■ MARINE BIRDS ■

The Johnstone-Bute Plan Area is rich in bird life and supports at least 5 endangered red-listed and 4 vulnerable blue-listed bird species (Table 7). The Plan Area has unique habitat that provide important and sensitive habitats that are critical for bird production. Unique to the Johnstone-Bute Plan Area are areas of seasonal nutrient rich upwelling currents that are generated by wind and tides within narrow passages and channels. These sites support a diversity of marine life and provide important feeding habitat for marine birds.

During spring and fall, estuaries, marshes, mudflats and other sheltered waterways provide key resting and feeding habitat for migratory birds (Table 6). The arrival of migratory species often coincides with seasonal biological events such as the Pacific herring spawning activity.

Estuarine habitat also provides critical breeding and rearing habitat for resident marine and shoreline bird species. It is well documented that estuaries and mudflats, particularly those that support significant beds of eelgrass (*Zostera spp.*) are amongst the most critical feeding habitats of marine and shoreline birds. All marine bird species require continued access to sheltered waterways and food sources, most commonly found in productive estuarine and marsh habitat. Studies on the east coast of Vancouver Island have shown that development impacts to estuaries can significantly reduce marine bird productivity.

Resident marine bird species and those that migrate to the Plan Area have greater management requirements including protection of specific breeding areas and control over human use, activity or disturbance at critical times of the year. Breeding season in the Plan Area typically occurs between April and August. The Canadian Wildlife Service (CWS) of Environment Canada has identified areas of interest, concern, and significant bird colonies in the Plan Area (Figure 13). Sensitive areas including annually monitored breeding sites are recognized by the CWS as globally significant Important Bird Areas (IBAs). Planning Units 4 & 7 contain the highest concentration of marine bird nesting sites including southern shore of Sunderland Channel and Goat Island off Helmcken Island (Table 7). Valuable marsh and estuary habitat used extensively by migratory and resident bird species can be found within coves and inlets located in Planning Units 1, 5, 10, 12, 18, 19 & 20.

The Johnstone-Bute Plan Area supports Bald Eagles with a number of nesting sites documented in the Plan Area. Nesting sites have been found throughout the Plan Area with the highest concentration of known eagle nests located in the Rapids Planning Units along the northeast shore of Sonora Island. High concentration of eagle nests have also been documented in Planning Units 1, 5, 6, 7, 10, 11 and 20 (Table 8). In coastal BC, Bald Eagles feed primarily on salmon, but waterfowl and small mammals are also eaten. Eagles typically nest in large coniferous trees near the shoreline of islands, estuaries, rivers, or creeks.

### ■ MARINE MAMMALS ■

The Johnstone-Bute Plan Area supports habitat for migrating and resident marine mammals. This section briefly describes the habitat utilization and

biology of marine mammal species found in the Plan Area. Table 9 summarizes the utilization of representative habitat categories and Planning Units by marine mammal species.

### Whales

The red listed Humpback whale (*Megaptera novaeangliae*) utilizes the Johnstone-Bute Plan Area. Humpback whales are members of the Family Balaenopteridae and grow to an estimated maximum length of 19 meters and weigh up to 45,000 kg. Sexually mature females (9+ yrs) can potentially give birth to one calf every two years, between January and April after a one-year gestation period. Humpback whales typically migrate to the North Pacific in spring, feeding for the remainder of the summer before their fall migration to warmer waters of Hawaii or Mexico where they calve and over winter. Humpback whales travel and feed in Canadian Pacific waters including the Plan Area from spring to fall (Table 9). The North Pacific population is classified as a threatened species, estimated at 2,000 whales and representing 33% of the world population. Humpback whales have been observed

within open waters of Johnstone Strait near Yorke Island and likely occur elsewhere within the Plan Area (Table 9). Their primary prey items include krill and small schooling fish. Humpback whales are known to concentrate prey by forming a bubble curtain, created by expelling air while ascending in a helical pattern beneath their prey.

The Plan Area is also inhabited by the Minke whale (*Balaenoptera acutorostrata*), which is the smallest of the Family Balaenopteridae measuring up to 11 meters. This typically solitary species is believed to shift northward during the summer months from the Bering and Chukchi Seas and southward to the equator during the winter. Minke whales have been observed year-round throughout Johnstone Strait including Planning Units 4, 7, 9 and 11 (Table 9). Minke whales feed on krill, other invertebrates and schooling fish.

The red listed sperm whale (*Physeter catodon*) has been occasionally observed in the Plan Area. Their occurrence is believed to correspond with the seasonal concentrations of squid; however utilization within the Plan Area is not well documented.

**Table 6. Utilization of the Habitat Categories and Planning Units by Marine Birds** (adapted from CWS 2003).

Species	Habitat Categories & Associated Planning Units (B=known important bird areas)				
	Protected Shallow Inlet	Low Current Channels and Inlets	High Current Channels and Inlets	Glacial Fjord	Moderately Deep Warm Inlet
<b>Planning Unit</b>	1,5,10	4,8,11,12,15	2,3,7,9,6,13,14,20	16,17,18	19
<b>Gull-like birds</b> (Gulls)		B (11)	B (7) B (7,13,20) B (7)	B (18) B (18)	
<b>Waterfowl</b> (Swans, Geese, Ducks)	B (1,5) B (1,5)	B (8,11,15) B (8,15)	B (1,3,7,9,14) B (1,3,7,14) B (7,9,14,20)	B (16,18) B (all) B (all)	B B B
<b>Wading Birds</b> (Hérons)					
<b>Diving Birds</b> (Cormorants, Loons, Grebes)	B (all) B (all)	B (8,11,12,15) B (8,15)	B (3,14) B (3,13,14) B (20)	B (17) B (17)	
<b>Inshore Alcids</b> (Murrelet, Murre, Guillemots)		B (4) B (8,11,15) B (15)	B (7,9) B (6,13,14,20) B (7,9,14)	B (18)	B
<b>Shore Birds</b> (Kingfishers, Sandpipers, Snipe, Killdeer, Oystercatchers)					
<b>Birds of Prey</b> (Eagles, Ospreys, Falcons)	B (all) B (all) B (all)	B (11) B (11) B (11)	B (all) B (all) B (all)		

Spring	Summer	Fall	Winter	Year round	No data
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Note: this table illustrates general trends by species and variations will occur outside the seasonal timing windows listed above. For more species specific locations within the Planning Units, refer to text or maps



Repeated sightings have been reported in areas like the lower Yuculta Rapids (Planning Unit 13). Sperm whales are the largest living representative of the Suborder Odontoceti (toothed whales) and grow to a maximum length of 20 meters. Though they occasionally feed on octopus, small squid, skate and fish, medium sized deep-water squid comprise the bulk of their diet.

### Delphinids

Orcas or 'killer' whales occur throughout the Plan Area. The Eastern North Pacific Northern Resident community occupies the coastal waters of west and east Vancouver Island from about mid-island to southeast Alaska and the Queen Charlotte Islands. From approximately May to October, the highest concentrations of resident pods are known to frequent protected inshore waters where they feed primarily on migrating salmon. The northern residents in particular travel throughout the back waterways of the Plan Area near Stuart Island. Transients occur along the entire coast of British Columbia, but tend to be found in shallow bays and inlets more often than residents.

Orcas (*Orcinus orca*) are the largest member of the Family Delphinidae and a top predator of the coastal British Columbia waters. Three genetically distinct ecotypes of Orca have been designated in British Columbia: the resident, offshore, and transient based on differences in their behavior, ecology, and social organization. All three ecotypes have been observed at all times of year throughout the Johnstone-Bute Plan Area. Resident Orcas feed primarily on schooling fish including salmon, whereas transients exploit marine mammals including Pinnipeds and other whale species. The less understood offshore Orcas were first catalogued by scientists in 1990 on the continental shelf and have since been observed utilizing coastal habitat including the Johnstone-Bute Plan Area. The most recent population estimate of off shore Orcas is 230 individuals; however insufficient data exists to determine existing trends. Current population estimates of the BC resident Orca population including northern and southern residents are 286 individuals, representing a decrease of 6% since 1994. The northern resident Killer whale is listed as a "threatened" species by the Committee on the Status of Endangered Wildlife in

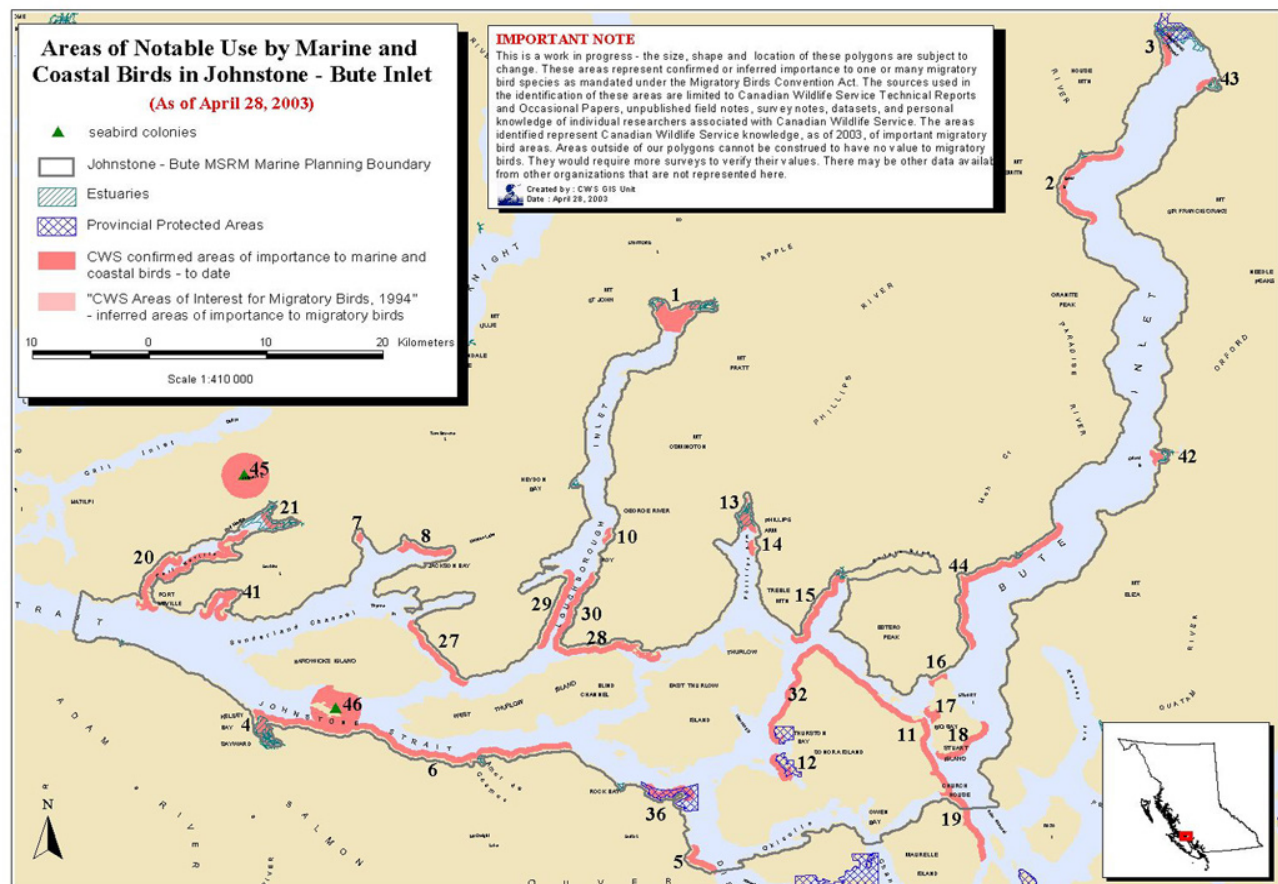


Figure 13. CWS Identified Areas of Notable Use by Marine and Coastal Birds April 2003

**Table 7. Seabird Colonies and Areas of Notable Use by Marine and Coastal Birds**

Planning Unit	Location	Known Season(s) of Importance	Species Groups (B: Breeding Site)	Listed Species (R: Red/B: Blue)	Figure 13 Ref.
<b>1 Port Neville</b>	Port Neville Inlet entrance through to Hanatsa Point	Spring, Fall	Mergansers, Pelagic Cormorant, Double-crested Cormorant, Dabbling Ducks, Diving Ducks	Pelagic Cormorant (R) Double Crested Cormorant (R)	20
<b>1 Port Neville</b>	Port Neville Inlet estuary at the head of the inlet	Spring	Surf Scoter, Long-tailed Duck, Pelagic Cormorant, Double-crested Cormorant	Pelagic Cormorant (R) Double Crested Cormorant (R)	21
<b>3 Yorke</b>	Blenkinsop Bay from Point George around to Tuna Point	Spring, Fall	Dabbling Ducks, Surf Scoter, Long-tailed Duck, Western Grebe	Western Grebe (R) Surf Scoter (B) Long-tailed Duck (B)	41
<b>5 Topaze Harbour</b>	Head of Jackson Bay	Spring	Surf Scoter, Long-tailed Duck, Dabbling Ducks,	Western Grebe (R) Surf Scoter (B) Long-tailed Duck (B)	7
<b>5 Topaze Harbour</b>	North Shore of Topaze Harbour	Spring, Fall	Surf Scoter, Long-tailed Duck, Dabbling Ducks, Loons, Western Grebe	Western Grebe (R) Surf Scoter (B) Long-tailed Duck (B)	8
<b>6 Wellbore Channel</b>	Eastern side of Wellbore Channel	Fall	Marbled Murrelet	Marbled Murrelet (R)	27
<b>7 Current-Race</b>	Kelsey Bay, Salmon Bay and the mouth of Salmon River	Fall, Winter	Gulls, Trumpeter Swan	Trumpeter Swan (B)	4
<b>7 Current-Race</b>	Goat Island	Spring, Summer, Fall	Glaucous-winged Gull (B), Pigeon Guillemot (B)		46
<b>7 Current-Race</b>	South side of Johnstone Strait from Ripple Point to Hkusam Bay	Spring, Winter	Mergansers, Marbled Murrelet	Marbled Murrelet (R)	6
<b>9 South Johnstone</b>	North Shore of Cordero Channel, from north of West Thurlow Island, east to Tallac Bay, includes Cordero Islands	Fall	California Gull, Marbled Murrelet	Marbled Murrelet (R) California Gull (B)	28
<b>9 South Johnstone</b>	Rock Bay to Chatham Point	Spring	Marbled Murrelet	Marbled Murrelet (R)	36
<b>9 South Johnstone</b>	Elk Bay from Elk Point to Moriarty Point	Winter	Surf Scoter, Long-tailed Duck	Surf Scoter (B) Long-tailed Duck (B)	5
<b>10 Philips Arm</b>	Head of Phillips Arm	Spring, Fall	Western Grebe	Western Grebe (R)	13
<b>10 Philips Arm</b>	Mouth of Shirley Creek in Phillips Arm	Spring	Surf Scoter, Long-tailed Duck	Surf Scoter (B) Long-tailed Duck (B)	14
<b>11 Nodales Channel</b>	Northwest side of Sonora Island, East side of Nodales Channel	Fall	California Gull, Marbled Murrelet, Common Murre, Western Grebe, Loons	Marbled Murrelet (R) Common Murre (R) Western Grebe (R) California Gull (B)	32
<b>11 Nodales Channel</b>	East side of Burgess Passage, south to opening of Chameleon Harbour	Fall	Surf Scoter, Long-tailed Duck	Surf Scoter (B) Long-tailed Duck (B)	12
<b>12 Frederick - Estero</b>	West side of Frederick Arm, includes the head	Fall	Western Grebe	Western Grebe (R)	15
<b>13 Rapids</b>	Arran Rapids	Fall	California Gull	California Gull (B)	16
<b>13 Rapids</b>	Barber Passage and Big Bay of Stuart Island	Fall	California Gull	California Gull (B) Pelagic Cormorant	17
<b>13 Rapids</b>	Entire East side of Sonora Island	Fall	Pelagic Cormorant, Double-Crested Cormorant, California Gull, Marbled Murrelet, Common Murre	Double Crested Cormorant Marbled Murrelet Common Murre	11
<b>15 Bute Entrance</b>	Southwest side of Stuart Island, from Harbott Point to Henrietta Point	Fall, Winter	Diving Ducks, Grebes	none	18
<b>15 Bute Entrance</b>	Northeast side of Maurelle Island, down to Rendezvous Islands (north)	Fall, Winter	Western Grebe, Marbled Murrelet, Common Murre	Western Grebe (R)	19
<b>16 Lower Bute</b>	West side of Bute Inlet across from Fawn Point	Spring, Fall, Winter	Surf Scoter, Long-tailed Duck	Surf Scoter (B) Long-tailed Duck (B)	44
<b>17 Orford</b>	Orford Bay and Mouth of Orford River	Fall, Winter	Trumpeter Swan, Western Grebe	Western Grebe (R) Trumpeter Swan (B)	42
<b>18 Upper Bute</b>	Bear Bay of Bute Inlet	Fall	Marbled Murrelet	Marbled Murrelet (R)	2
<b>18 Upper Bute</b>	Mouth of Southgate River	Spring, Fall, Winter	Dabbling Ducks, Surf Scoter, Long-tailed Duck, Trumpeter Swan	Surf Scoter (B) Long-tailed Duck (B) Trumpeter Swan (B)	43

Table 7. (Continued)

Planning Unit	Location	Known Season(s) of Importance	Species Groups (B: Breeding Site)	Listed Species (R: Red/B: Blue)	Figure 13 Ref.
18 Upper Bute	West side of Waddington Harbour	Spring, Winter	Canada Goose, Dabbling Ducks, California Gull, Trumpeter Swan	California Gull (B) Trumpeter Swan (B) Canada Goose (B)	3
19 Loughborough Inlet	Lower East side of Loughborough Inlet	Fall	Marbled Murrelet	Marbled Murrelet (R)	30
19 Loughborough Inlet	Lower West side of Loughborough Inlet	Fall	Marbled Murrelet	Marbled Murrelet (R)	29
19 Loughborough Inlet	Head of Loughborough Inlet, includes Cooper Reach, Frazer and McBride Bays	Fall, Winter	Dabbling Ducks, Trumpeter Swan, Marbled Murrelet	Marbled Murrelet (R) Trumpeter Swan (B)	1
19 Loughborough Inlet	Mouth of Gray Creek in Loughborough Inlet	Spring	Dabbling Ducks, Diving Ducks	none	10

Table 8. Identified Eagle Nesting Areas

Planning Unit	Location
1	At Ransom and Neville Point and throughout entrance of Port Neville Inlet
5	Jackson Bay and south shore of Topaze Harbour
6	Thynne Peninsula, Carterer Point and the head of Forward Harbour
7	Shores of Hardwicke and Helmcken Islands
10	Shoal Bay and adjacent shores, East Thurlow Island
11	Lee Islands, Brougham Point and within Thurston Bay
13	Sonora Island shoreline and Gillard Island
14	Hole in the Wall, Barnes Bay and the Upper Rapids
20	Charles Bay, East Thurlow Island Erasmus Island, Cordero Channel Greene Point Rapids

Canada (COSEWIC) while the status of the southern resident population is “endangered”. Most of the resident whale population that occupy a northern range between Alaska and mid-Vancouver Island (205 individuals) have been observed in the Johnstone-Bute Plan Area. Resident Orcas exhibit a strong seasonal trend in distribution through the Plan Area between May and October, corresponding to the annual return migration of adult salmon in summer and fall.

At present, there are 220 catalogued transient Orcas. These transients are listed as a “threatened” species and range between southeast Alaska and British Columbia. Whale researcher Graeme Ellis of the Pacific Biological Station reports a growing trend in the transient population, however insufficient data exists to determine if the trend is attributed to calving rates or adult recruitment from other outside populations. Unlike resident Orcas, food related seasonality is not a factor in the distribution of transient Orca populations in the Plan Area as favoured marine mammal prey species are year-round inhabitants. Prey species of the transient Orca include seals, sea lions and other whales.

Other members of the Family Delphinidae that utilize the Johnstone-Bute Plan Area include the Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), Dall’s porpoise (*Phocoenoides dalli*), and harbour porpoise (*Phocoena phocoena*). Harbour porpoises generally frequent relatively shallow inshore waters of bays, channels, and estuaries, whereas Dall’s porpoises and Pacific white-sided dolphins tend to occur in deeper stratified water where feed is concentrated by current. All three species are known to feed on squid, hake, mackerel, and small schooling fish such as capelin, anchovies, and herring.

#### Pinnipeds

The Plan Area supports habitat for members of the Suborder Pinnipedia including Harbour seals (*Phoca vitulina*) and Steller’s sea lions (*Eumetopias jubatus*). Harbour seals are generally found in nearshore areas of bays, harbours, and estuaries. They feed in shallow coastal waters and haul-out to rest on rocks, rocky shores, or intertidal sandbars. The harbour seal’s diet consists mainly of fish (salmon, rockfish, cod, herring, flounder) as well as mollusks, squid, octopus, and crustaceans. Harbour seals are known to utilize the Johnstone-Bute Plan Area year round with highest densities observed at Yorke Island, Poyntz Island, Estero Basin, Hole in the Wall, Bute Inlet, Vere Cove, Helmcken Island, Walkem Islands, Arran Rapids, Jimmy Judd Island, Sea Lion Rock, Gillard Island, Tug Boat Pass, Dent Island and Mayne Passage. Areas of high feed concentration exposed to current are favored for summer haulout locations while sheltered inlets and bays may be used in the winter.

Steller’s sea lions generally occupy rocky coastline areas. Haulout sites include rock ledges, rocky islets, or other exposed sites near land. If such sites are not available, sea lions will rest together in groups at the

**Table 9. Seasonal Utilization of Known Habitat Categories by Marine Mammals**

Marine Mammal Species	Habitat Categories & Associated Planning Units (M=known migration route; F=known feeding grounds; H=known haul-out sites)				
	Protected Shallow Inlet	Low Current Channels and Inlets	High Current Channels and Inlets		Moderately Deep Warm Inlet
<b>Planning Unit</b>	1,5,10	4,8,11,12,15	2,3,7,9,6,13,14,20		16,17,18
<b>Sperm whale</b>			MF (13)		MF (13)
<b>Humpback whale</b>			MF (3)	MF (3)	MF (3) MF (3)
<b>Minke whale</b>		MF (4,11)	MF (7,9)		
<b>Orcas</b> (Resident & Transient)	MF (1,5)	MF (all)	MF (all)		F (all)
<b>Other Delphinids</b> (porpoises & dolphins)	MF (1,5)	MF (4,11)	MF (2.3.6.7.9.14.20)		F (all)
<b>Pinnipeds</b> (sea lions & seals)	FH (1,5)	FH (4,12,15)	FH (all)		FH

Spring	Summer	Fall	Winter	Year round	No data
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Note: This table illustrates general trends by species and variations will occur outside the seasonal timing windows listed above. For more species specific locations within the Planning Units, refer to text or maps

water's surface, or close to the shore in inlets, channels, or exposed areas. Steller's sea lions feed mainly on fish such as hake, herring, Pacific cod, rockfish, and salmon, but squid, octopus, and crustaceans are also eaten. Both harbour seals and northern sea lions are known to travel up major rivers in pursuit of anadromous fish. Known haulout sites for Steller's sea lions are located at Yorke Island, Murray Island, Vere Cove, Helmcken Island, Walkem Islands, Edith Point, Arran Rapids, Jimmy Jud Island, Hole in the Wall, Bute Inlet and Mayne Passage.

#### ■ RED AND BLUE LISTED SPECIES ■

A number of locations in the Plan Area provide habitat for red- or blue-listed marine birds, mammals, and plants. The red- and blue-list classification is given by the provincial government to species that are considered by scientists to be at risk due to declining populations or habitats as the result of human activities. Red-listed species are those which are extirpated, endangered, or threatened, or are in danger of becoming so. Blue-listed species are classed as vulnerable because they are especially sensitive to human activities or natural events. Red and blue listed marine species in the Plan Area are shown in Table 10.

## 2.5. Social and Economic Profile

### ■ COMMUNITY ■

The Plan Area is within the Comox Strathcona Regional District (CSRD), electoral Area J. Area J is geographically larger than the Plan Area and includes Quadra Island, which accounts for a large proportion of the electoral area's population. The Plan Area also includes the asserted traditional territories of the Xwémalkwu, Klahoose, Tlowitsis, Kwiakah, Comox, We Wai Kai and We Wai Kum First Nations.

The Plan Area is sparsely settled. The largest population concentration within the Plan Area is the incorporated Village of Sayward, located on Vancouver Island. Localities as defined by BC Statistics include the islands of East and West Thurlow, Port Neville and Stuart Island; the populations of these islands largely vary seasonally. There are also a number of First Nations Reserves within the Plan Area, most of which do not have permanent residents.

Census information (i.e. population and other demographic data) is not available for a geographical unit that exactly matches the Plan Area. The closest geographic boundaries correspond to two dissemination areas, plus Sayward and the Indian reserves. The 2001 Census for these units totals 518 persons. Except for population data, all other Census information (e.g. age, income, etc.) for the



## FRAMEWORK AND DIRECTION

### 3.1. Use of the Plan

The Johnstone-Bute Coastal Plan is designed to assist prospective land tenure applicants, First Nations, local government, LWBC and other government agencies in dealing with applications for the use of provincial Crown foreshore and nearshore tenures. The Plan may also provide a useful tool to assist in the marketing of community and First Nation economic development opportunities.

Use of the Plan should benefit First Nations, local government, LWBC and other government agencies by screening or filtering out potential Crown land applications which may have limited suitability within a specific geographic area. In this way, work loads of these agencies and organizations can be expected to be lowered in both volume and level of complication or controversy.

Although the Plan has been developed with the assistance and support of the Regional District of Comox Strathcona, the Plan is not intended to replace the need for referrals to local government. Similarly, the Plan is not intended to replace provincial or federal agency referrals or to absolve LWBC from addressing its legal obligations to consult with First Nations on land tenure applications.

With the exception of other compelling constraints or LWBC application requirements, applications for uses that are consistent with the Plan should be accepted and evaluated by LWBC. The Plan is not intended to address operational or production requirements associated with finfish, shellfish or marine plant aquaculture. These aspects of aquaculture are addressed in aquaculture management plans associated with aquaculture tenures.

Future development of offshore oil and gas resources was not considered in developing the Plan. This Plan and its recommendations will not affect or prejudice any offshore oil and gas development, including any land requirements for offshore oil and gas activities.

### 3.2. Planning Units and Unit Data

The area covered by this Plan has been divided into smaller Planning Units to permit a more precise examination on uses and interactions occurring in the Plan Area. The Planning Unit boundaries are largely based on the BC Marine Ecological Classifications (BCMEC) with some modification to reflect human use patterns and specific biological features. Section 3.12 of this Plan presents descriptions, and management recommendations for each of these units. For each Planning Unit, a description and map is provided of resource attributes, existing tenured uses, non-tenured activities, status of adjacent upland, and resource capabilities for selected uses. Figure 15 provides the legend for Planning Unit maps. Although some upland features are shown, the objective of identifying these values and uses is simply to provide a more detailed sense of existing conditions. The Plan does not prescribe uses for these upland areas.

Planning Unit descriptions and attributes reflect data drawn from two sources: government databases and local knowledge. Established government databases are the source of most of the data in this Plan. Such data has been collected and assembled according to standardized methods determined by the Province's Resource Inventory Standards Committee. This approach helps to ensure the quality and consistency of that data.

An equally important source of data is local knowledge gained through stakeholder consultation for this Plan. Local knowledge often provides insight into particular attributes of an area; however, because this data is not gathered and validated according to provincial data inventory standards, it cannot readily be added to established government databases. Planning unit attributes in Section 3.12 that are based on local knowledge are identified with an asterisk "\*". While this data is useful and important to the Plan, users of this Plan are cautioned that this data has not been validated. Users of this Plan should also recognize that local knowledge data may not be present in government databases.

\* denotes local knowledge

### 3.3. Defining Areas of Ecological Significance

The Areas of Ecological Significance (AES) designation is used to identify areas where existing conditions support complexities of biological values, ecological structures and/or processes, known habitat of species at risk, or other areas of high ecological value and sensitivity where the full range of values are not identified and addressed through existing siting criteria.

From a development perspective, applications for tenure in these areas will be subjected to higher levels of scrutiny in the course of federal agency referrals. With respect to the tenure application referral process, this heightened level of scrutiny has the potential to result in greater expenses associated with site specific inventories and surveys, onsite mitigation measures, construction timing constraints and generally lower likelihoods of DFO authorization for habitat alteration, disturbance or destruction (HADD) and ultimately, tenure approval. Consequently, proponents should carefully consider the need to make applications in such areas if opportunities exist elsewhere.

AES information is provided for each Planning Unit as a descriptive narrative that outlines ecological attributes in relation to ecological processes and structure. To date, the following valued ecological attributes are being used as criteria to identify Areas of Ecological Significance.

- Biological Productivity - areas of high net export of productivity and processes (estuaries, saltmarshes, areas of upwelling, highly complex benthic areas, rocky reefs, kelp forests, eelgrass)
- Biodiversity - areas critical in promoting genetic, species and ecosystem/habitat diversity (e.g. estuaries, rocky reefs, kelp forests)
- Reproductive Habitat - breeding, spawning and nesting areas (e.g. salmon streams, eelgrass beds, forage fish spawning beaches)
- Bottleneck/Seasonally Critical Habitat - areas where a particular species or groups of species concentrate (e.g. holding areas; marine mammal calving areas, rubbing beaches, etc.) and/or are dependant upon seasonally (e.g. overwintering) sites, rearing areas and migration routes
- Endangered/Threatened Species Habitat - species listed under the *Species at Risk Act*

- Rare/Unique Habitat for Rare Species - habitat utilized by species with limited ranges or habitat found in only a few locations (e.g. native bivalve beds, rocky reefs)
- Significant Species or Species of Concern (e.g. Pacific salmon, herring, killer whales, abalone, seaotters, nearshore rockfish)

Other second order criteria being explored to define further AES and include areas of naturalness/integrity, habitat necessary for dependency/survival, fragile/sensitive areas, and areas that are representative of biogeoclimatic zones. Overtime, DFO will further develop criteria to identify AES within coastal planning areas in order to manage development in a manner that will sustain valuable ecological attributes.

In addition to AES, which often contribute to broad scale ecological structures and/or processes, there are specific features that are acknowledged as sensitive habitat. Development proposals for any of these areas are governed by established provincial siting criteria and/or will be subject to greater scrutiny by reviewing agencies during the approval process. As a matter of policy, where site specific investigations determine that these habitat types are present, DFO will not consider an authorization for the harmful alteration, disruption or damage (HADD) of these fish habitats, until and unless all other preferred alternatives (e.g. project relocation, project redesign and full mitigation) have been explored and determined to not be feasible. In cases where a HADD must be authorized, habitat compensation (in the form of new habitat or enhanced habitat) will be required from the proponent in order to offset any losses in productive capacity associated with the HADD. There is often a greater than 1:1 ratio of lost habitat to compensatory habitat required as there is typically a lag time before “new” habitats are fully functioning and there is also a risk of compensatory failure.

Proponents are consequently strongly cautioned with regard to proposals that may overlap such areas. Sensitive habitats include, but are not limited to:

- estuaries
- salmon streams
- eelgrass beds
- kelp forests
- native bivalve beds
- herring spawning areas
- forage fish spawning beaches
- mudflats

\* denotes local knowledge

- saltmarshes
- marine mammal haulouts, calving areas, rubbing beaches
- critical habitats for SARA species

Note: This list of high value habitats is not comprehensive and only includes some examples of sensitive habitats.

### 3.4. Uses and Activities

This Plan addresses a range of uses and activities that occur in foreshore and nearshore areas. It applies specialized definitions of the terms use and activity. Use refers to undertakings that are subject to provisions of the provincial *Land Act* requiring that they be tenured. Table 16 lists and describes uses that

are addressed by this Plan. Activities are undertakings that are not subject to provincial tenure. Table 16 presents a generalized list of activities known or anticipated to occur in the Plan Area. This Plan makes recommendations regarding uses, but not activities. Activities are listed in this Plan to ensure that the range of uses and activities are considered when management decisions are made.

### 3.5. Determination of Use Acceptability

The determination of acceptable uses is based on decision rules that consider existing use commitments, compatibility, and agency siting and best management practices. A list of basic decision rules and other decision assistance tools are provided

**Table 16. Foreshore and Nearshore Uses**

Use	Description
Shellfish Beach Aquaculture	The commercial seeding, growing and harvesting of marine molluscs, shellfish or other invertebrates in a natural or manufactured environment conducted within the intertidal zone
Shellfish Deepwater Aquaculture	The commercial seeding, growing and harvesting of marine molluscs, shellfish or other invertebrates below the low tide mark using suspended trays, lines or other structures anchored to the seabed, including sub-tidal aquaculture
Finfish Aquaculture	Growing of salmon and other species (fish of the classes Agnatha, Chondrichthyes and Osteichthyes) in deep water net cages or other containment structures, anchored to the seabed or foreshore
Marine Plant Aquaculture	The commercial growing and harvesting of marine plants in a natural or manufactured environment.
Float Homes	Structures used as single family dwellings on a seasonal or continuous basis. Includes physical structure, improvements including permanent private ways, boat house and walkway ramp or other pedestrian linkage to upland
Floating Lodges/Camps	Continuous or seasonal occupation of foreshore areas for boat haul out, camping and related activities and access to camping on adjacent upland Continuous seasonal moorage of floating camps or mother-ships camps or structures on pilings or floats, including docks associated with floating lodges and base camps
Commercial Recreation Guiding	Extensive commercial recreation guiding operations, including kayaking, diving, wildlife viewing and other eco-tourism Category is limited to seasonal occupation of areas across a guiding region Minor modifications are acceptable on a seasonal basis provided they serve to contain or reduce overall impact of activities (example: toilet facilities, fire pits, etc)
Log Booming and Handling	Designed to permit transfer of logs to and from the marine environment to facilitate sorting, transportation and processing. Includes physical structures such as pilings and anchor devices. May involve modifications of intertidal area to support related activities. Structure may be based upon fill and include permanent ways or ramps Includes floating forestry camps and related facilities and infrastructure
Helicopter Log Drops	Permits the safe transfer of logs to the marine environment from the air Minimum depth is primary siting consideration
Boat Launches	Ramp or rail system (way) used to deliver boats to and from the water Includes fill based ramps, rail ways
Private Residential Moorage	Year round facility comprised of a single floating dock, wharf or pier (including walkway ramp) or combination thereof, used for moorage by a number of individuals or a family unit solely for private use. Not normally removed in its entirety on a seasonal basis. Structure limited to floating and pile based designs. Private moorage is permitted where associated with private land or Crown leases on upland
Commercial and Industrial Docks	Docks, wharves, piers, breakwaters and related structures associated with commercial or industrial activities such as marinas, boat houses, restaurants, as well as facilities such as fish processing plants and ferry access Structure may involve filling of the foreshore or pile and float based designs
Public and Institutional Docks	Docks, wharves, piers, breakwaters that provide specifically for non-commercial public and institutional moorage, access and use (i.e. access to recreation, parks, communities)
Marine Telecommunications and Utilities	Underwater hydro, telephone, utility right of way, floating and foreshore wave energy generating facilities
Conservation/Recreation	Use for conservation of cultural and recreational resources, marine ecosystem or fish habitat; includes areas required for scientific and research purposes. Includes existing regional and local parks, <i>Land Act</i> reserves or notations of interest for conservation and recreation; and existing provincial parks, ecological reserves, conservation or protection areas.

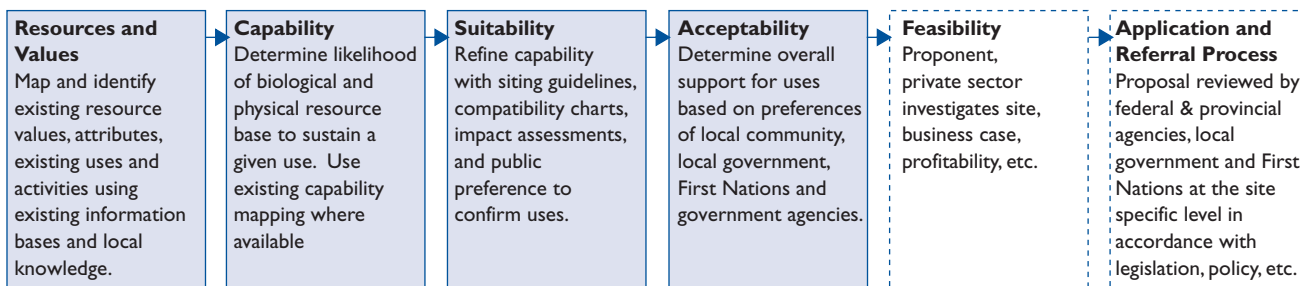


Figure 17. Conceptual Diagram of Acceptability Determination. Note that Plan direction ends at the Acceptability stage – Feasibility and Application and Referral Process are the responsibilities of proponents and designated agencies.

in Appendix 5. This initial determination was refined to reflect review and discussion with the public, local advisory committee members, local government, First Nations and stakeholder groups. The process is identified conceptually in Figure 14.

### 3.6. Planning Unit Direction

The degree of acceptability of uses that may be tenured by Land and Water British Columbia (LWBC) is determined using the three level code of Table 18. Ongoing activities (not under provincial jurisdiction) are also identified. The determination of acceptable uses was developed by considering existing use commitments, decision assistance tools, such as compatibility guides, provincial agency siting criteria and best management practices (Appendix 3) and local knowledge, information and advice from the public, First Nations, local government, and interest groups.

For each unit “Conditions for Acceptance of Tenure Application” and “Tenure Approval and Management Guidelines” serve to refine acceptability recommendations to the specific conditions within each Planning Unit including the area where an acceptable use may proceed or the conditions that a proponent for a “conditionally acceptable use” must address. Note that Conditions for Tenure

Application and Tenure approval and Management Guidelines may include broad direction for all uses including those recommended as Acceptable, particularly where development should be excluded from, or should be managed with consideration for, identified areas of sensitive habitat.

A required action section will identify tasks for follow-up and implementation including general tasks/concepts identified during discussion with the Plan Advisory Committee that require further work.

Based on these factors, each Planning Unit has been assigned to one of four “management emphasis” categories Table 19. Emphasis categories are not intended as conventional land use designation or zoning categories, which prescribe the same recommended uses and activities for all units with the same management designation. Instead each category represents a characteristic “flavour” of existing uses, level of development, and values or opportunities rather than indicating a specific suite of zoning-based direction as has been developed in terrestrial management plans. Further, consistent with use recommendations, management emphasis does not eliminate the opportunity for specific uses; rather it provides additional guidance on how an acceptable use should be developed in a given area.

**Table 17. Foreshore and Nearshore Activities**

Activity Category	Description
First Nations Use	Traditional and existing uses including sustenance, spiritual, ceremonial, heritage sites & routes NOTE: The Plan recommendations on acceptability of a tenure application do not alter or remove provincial agency obligations for First Nations consultation if specific development applications are accepted for processing
Commercial Fisheries	Fishing by vessel using a variety of gear-types in accordance with federal regulations, licences and openings. Includes commercial clam and shellfish harvesting, and commercial crab, prawn and shrimp harvesting under licence
Public Recreation	Wildlife viewing (non-licensed); swimming; kayak staging & landing areas; surfing; scuba diving; birding; sport fishing angling; fly-fishing; public harvesting of shellfish; Power boat, sailboat, canoe and kayak routes
Marine Transportation	Tow, barge, freighter, ferry, and cruise ship routes

\* denotes local knowledge



**Table 18. Code for Acceptable Uses and Activities**

✓	Acceptable. The use is considered appropriate. Applications for this use should be accepted for processing and evaluation. Acceptance of an application does not guarantee that a tenure will be approved by LWBC or meet local and federal government requirements
O	Conditionally Acceptable. The use is considered conditionally acceptable. New applications for this use should be accepted for processing and evaluation only if they meet the terms of relevant Conditions for Acceptance of Tenure Application in the Plan.
X	Not Acceptable. The use is considered inappropriate. Applications for this use should not be accepted for processing and evaluation.
P	The non-tenured activity is present and ongoing in the Planning Unit
A	The non-tenured activity is absent from the Planning Unit

The Plan provides a variation process for uses marked as X or O under certain circumstances and conditions.

**Table 19. Management Emphasis Categories****Conservation Emphasis**

- Units predominated by or adjacent to significant marine ecological or cultural features and values, including existing terrestrial or marine protected areas (or proposed areas) and areas withdrawn or reserved from disposition for conservation values.
- Activities and tenured uses should be compatible with and sensitive to conservation values in the unit or on adjacent upland.
- Preferred future uses are those that would be compatible with the conservation and cultural values and features on which the unit emphasis is based.
- Management mechanisms applied in these units include: compatible or complementary uses only; special management and siting criteria; further investigation for marine protection designation; and reserves or notations of interest to ensure tenure applications are compatible with values.

**Recreation Emphasis**

- Units predominated by public and commercial recreational activities, significant features and opportunities, including areas withdrawn or reserved from disposition for recreation values. Often adjacent to significant terrestrial or marine protection areas (or proposed areas) with high recreation values.
- Recreational values, opportunities and experiences should be maintained and/or encouraged.
- Other activities and tenured used should be sensitive to recreational values and experiences, particularly in key seasons or periods.
- Preferred future uses are those that would be compatible with the recreation values and features on which the unit emphasis is based.
- Management mechanisms applied in these units include: compatible or complementary uses only; special management provisions and codes of practice to minimize impact or conflict during recreational seasons; and reserves or notations of interest to ensure tenure applications are compatible with values.

**Community Emphasis**

- Units predominated by public and commercial recreational activities, significant features and opportunities, including areas withdrawn or
- Units predominated by a concentration of multiple uses and activities that are associated with adjacent floating or upland settlement. Typically includes combinations of commercial, industrial, community and public institutional uses, private moorage and rural development.
- A variety of uses is maintained and/or encouraged in these areas, and most uses should be compatible.
- Non-commercial activities and tenured uses should be undertaken with the expectation that they will not interfere with or impede existing uses and activities.
- Management mechanisms applied in these units include: special management provisions and codes of practice to minimize conflict; reserving of specific opportunity areas for future tenure; and provisions to minimize impact of development or preclude development in specific areas.

**General Marine Emphasis**

- Units characterized by relatively remote locations with limited uses and / or development potential, with ongoing marine transportation and navigation activities and commercial and recreational fishery activities.
- Units include sporadic and discrete provincially tenured uses such as log handling facilities.
- Preferred uses are those that would be compatible with ongoing activities and existing uses.
- Management mechanisms applied in these units include: special management provisions to maintain fisheries access and navigation requirements; use of standard codes of practice and tenure provisions; and provisions to minimize impact of development or preclude development in specific areas.

Final unit recommendations reflect review and discussion with the public, interest groups; local government, government agencies and First Nations (see Appendix 2).

### 3.7. Site Specific Considerations for Tenure Applications

The Johnstone-Bute Coastal Plan contains a considerable amount of information, including

compatibility and siting assessments (Appendix 6) that are designed to provide proponents where habitat values within the Johnstone-Bute Plan Area are most likely to exist. However a Plan such as this may not capture all habitats present or predict all the variables that may possibly impact them. Therefore it may be necessary to review project applications on a site level basis in order to ensure the habitat protection objectives are met. For additional information on this topic please refer to Appendix 6.

### 3.8. Aquaculture Assessment/ Opportunity

#### ■ SHELLFISH CAPABILITY ■

MAFF has conducted biophysical capability assessments for shellfish aquaculture in most areas of coastal BC, including the Johnstone-Bute Coastal Plan Area.

The “capability” of an area refers strictly to 14 environmental parameters, including salinity, temperature and exposure measured during beach and oceanographic surveys, which affect the ability of the environment to support the culture of Manila clams, Pacific oysters and Japanese scallops. Shellfish culture capability is based on field data collection along with a rating scheme that can be used during site-specific feasibility studies or at a broader scale to determine the potential of an area to support culture. Capability is different from “opportunity” or “suitability” analyses which are conducted during site-specific or broader land use planning processes and factor in criteria to determine social acceptability. This involves considering capability along with socio-economic and compatibility factors related to other existing and potential resource uses.

This plan makes use of capability assessments that have been completed and mapped on a broad scale. Capability assessments performed at this broad scale cannot be used to determine whether a specific site will be a good place to culture shellfish. Site specific capability and feasibility studies as well as tenure and licence application and referral are still necessary to realize a shellfish farm at a particular site. The capability studies help to determine sites that will support culture, thereby helping to focus where to conduct feasibility studies.

#### ■ FINFISH AQUACULTURE OPPORTUNITY ■

Finfish Aquaculture Opportunity areas are based on an overlay analysis of various information sources. Biophysical capability studies conducted in 1987 by MAFF were modified by government staff based on more recent information and current salmon farming siting criteria. Based on this work, areas were then identified as Opportunity Areas: OA1 and OA2. Areas identified as OA1 were defined as Good to Medium and which are not constrained by current government siting criteria. The OA2 ratings represent areas of Poor Capability that are not constrained by

government siting criteria. Assessments are not available for some areas, due to limitations of the underlying data availability. In such situations, capability assessment is recorded as No Information.

Data used for the 1987 biophysical studies were generalized to a broad level 1:125,000 mapping scale and consequently, there may be specific areas within each ‘opportunity area’ that are inconsistent with these general ratings. The Opportunity Areas 1 & 2 should therefore be considered recommendations and used only as a general indication of capability. Some high potential localized opportunities can and do exist in areas generally classified as limited; conversely some areas may be of poor capability despite being identified as OA1.

It is still incumbent on companies to conduct site specific feasibility studies for any tenure application and to obtain necessary approvals from local government, provincial and federal agencies, including DFO. For further details on Aquaculture Opportunity Studies please see:  
<http://srmwww.gov.bc.ca/dss/projects/sarp/index.htm>

#### ■ MARINE PLANTS ■

The commercial harvest of marine plants is recognized as an emerging aquaculture industry and recommendations for commercial marine plant culture are made for each unit.

The province issues licences for the commercial harvest of kelp for specialty foods and fertilizer as well for use in the Spawn on Kelp fishery, managed through DFO. Based on similar biophysical requirements between scallops and kelp, scallop aquaculture capability is used in this Plan as a surrogate for kelp aquaculture capability. Applicants may still be required to collect additional biophysical capability information for the proposed area of use.

### 3.9. Xwémalhkwu Coastal and Marine Planning

The Xwémalhkwu First Nation is currently undertaking its own land use planning initiative for the area of its asserted traditional territory. Neither the Province nor the Government of Canada takes any position on these views within the context of the Johnstone-Bute Coastal Plan. Further, the Province and the Government of Canada take no position regarding the presence or absence of similar

recommendations from other First Nations with asserted traditional territory in the Johnstone-Bute Coastal Plan Area.

At the time of plan development, the Xwémalkhu input was limited to the identification of specific areas of interest. These Xwémalkhu First Nation area designations include:

- Rockfish and Lingcod Conservation Areas
- Krill Conservation Areas
- Salmon Enhancement and Protection Zones
- Heritage Protection Sites and Zones
- Black and Grizzly Bear Conservation Areas

Traditional use information included in this document is subject to ongoing refinement and review by the Xwémalkhu First Nation. Traditional Use Study information depicted on unit maps has been augmented by additional written submissions. Refer to unit descriptions and the Xwémalkhu submission (Appendix 3) for more information. This information is included in the Johnstone-Bute Coastal Plan in order to provide additional information to referral agencies and to stakeholders concerning the perspective of the Xwémalkhu First Nation towards land use development. For additional information, parties are encouraged to contact the Xwémalkhu First Nation directly (see Section 5 for Contact Information).

### 3.10. Upland Owner Riparian Rights

In British Columbia, the foreshore is held by the Crown rather than the owner of the adjacent upland property, except in isolated cases of historic Crown Grants. Nevertheless, the upland owner has legal rights that may preclude the issuance of a foreshore or nearshore tenure. The most significant of these is the right of riparian access. In practical terms, any improvement on or adjacent to the foreshore that obstructs the upland owner's access from any point along the foreshore of the property to deep water for the purpose of navigation interferes with the owner's riparian rights. In such circumstances, the province requires that the applicant obtain written consent from any adjacent upland owner whose riparian rights may be affected by the proposal. LWBC requires applicants to notify by letter all adjacent landowners and tenure holders of the site proposal. Nearby landowners may provide comments on the proposal to the applicant, the local government or to LWBC.



### 3.11. Navigable Waters

Transport Canada ensures the protection of the public right to navigation and the protection of the environment any body of water capable of being navigated by floating vessels of any description for the purpose of transportation, commerce or recreation through the administration of the Navigable Waters Protection Act (NWPA). This Act addresses navigation on both inland and coastal waters. As a consequence, any application for tenure that has the potential to impact navigation is subject to review and assessment.

Navigational routes identified on the Planning Unit maps are intended to highlight areas of the Johnstone – Bute Plan Area that are commonly used for navigation purposes and thus are areas in which tenures would be at high risk for conflict with NWPA requirements. The information presented on the map was collected as part of the Coastal Resource Inventory Study (CRIS 1987); this was then supplemented with local knowledge collected by the DFO Fisheries Guardian for the area.

Applying for tenure in areas of the Johnstone – Bute plan that are not currently identified as having a significant impact on navigation does not necessarily guarantee federal approval. These routes are included for illustrative purposes and do not supercede Transport Canada's responsibilities for enforcing the NWPA. Transport Canada retains the right to assess all applications on a site-to-site basis and require mitigation when deemed necessary.

Navigation routes depicted on the maps include routes used for primary and secondary shipping, as well as log towing. These routes are not necessarily drawn to scale; the width and position of route will vary according to ship type, weather and other navigation concerns. The routes themselves are divided into two categories:

- Assessment Area 1 (  ) – This buffer is immediately adjacent and parallel to the shipping route. Applications for tenure in this area are unlikely to receive approval from the Coast Guard.
- Assessment Area 2 (  ) – This buffer extends beyond Assessment Area 1 and reflects the realistic variation of routes according to size and type of ship, weather, etc. In areas where log tow operations are known to be affected by prevailing conditions, the buffer has been expanded to reflect

those areas at risk of contact with swinging log booms being towed in the shipping route. Applications for tenure that include portions of these areas will be subject to further assessment as required by NWPA but may receive federal approval pending the feasibility of effective mitigation measures being developed.

Areas outside these buffers have a lower potential for conflict with marine navigation, and will be assessed on a site specific basis. Mitigation measures may still be required. For more information on the Navigable Waters Protection Program, refer to <http://www.tc.gc.ca/marinesafety/Ships-and-operations-standards/nwp/menu.htm>



## PLAN ASSESSMENT

### 4.1. Environmental Components and Mitigation Measures

#### ■ RISK ASSESSMENT ■

Most human activities have the potential to both positively and negatively affect the environment. Understanding the risk of tenured activities, such as those addressed in this Plan, is critical in deciding whether to allow, or how to manage, each activity.

Risk is normally assessed by evaluating both the significance (extent, severity and duration) of negative effects and the probability of their occurrence. An ideal risk assessment would involve analysis of the probability and significance components of risk using a detailed mathematical analysis of ecosystem interactions anticipated from a proposed activity. However, in most cases, such as this Plan, the extensive data necessary for this kind of analysis were not available.

Additionally, the scale at which this Plan has been prepared is not fine enough to guarantee that a level of risk defined in the Plan could be automatically applied at the site specific application level. Site specific assessments are still required to determine the level of risk associated with each tenure application. A number of Technical Siting and Compatibility Criteria for Tenured Uses are used by various referral agencies to reduce risk from coastal developments (See Appendix 5 for detailed description of these criteria). The Plan accepts these as mechanisms to further reduce the environmental risk of Plan provisions at the site-specific tenure application stage,

This section provides an evaluation of the Valued Environmental Components (VECs) within each of the Plan's 20 Planning Units compared to the mitigative measures prescribed through the Management Conditions for the Acceptance of Tenure Applications, the Tenure Approval and Management Guidelines and Required Action items which are designed to minimize the environmental risk from future tenured development.

#### ■ METHODOLOGY ■

In the absence of sufficient data it is not feasible to assign mathematical probability and significance

values to the various tenured activities.

Consequently, a qualitative approach was used to summarize the VEC's within each of the 20 Planning Units along with the mitigative management conditions and requirements of the Plan.

This approach was based on the following assumptions:

- The technical siting and compatibility criteria were developed by various review and licensing agencies on the understanding that their use would reduce risk. Therefore, if the Plan recommends areas that would be acceptable or conditionally acceptable for tenure application that satisfy the criteria, the risk of the Plan provisions can be considered to be low
- It is not possible to estimate the actual range and number of new tenures (and therefore new impacts) that might be issued for each tenured use with or without the Plan, due to changing market forces, availability of financing etc.

Eight VEC's were used in this analysis for the Johnstone-Bute Coastal Plan. Each are biological values considered to be important components of the marine ecosystem (clam beds, eelgrass beds, salmon streams, kelp beds, CWS areas, eagle nests, estuaries and pinniped haulouts). Each of these are included in the technical siting and compatibility criteria for agency reviews of site-specific tenure applications (Appendix 5). In most areas, information provided by BC Government data sets has been supplemented with local and First Nations knowledge.

In addition to the VECs and mitigation factors, each of the 20 Planning Units have been categorized by Management Emphasis. The Management Emphasis category is an outcome of the planning process rather than a zoning designation, with the intent of providing a 'theme' for the future management of the area (i.e. a conservation emphasis recommends that the unit be managed primarily for conservation values while a general marine emphasis would be more likely to have a broader range of tenure types). Throughout the Plan there are four primary management emphasis categories and two combination emphasis groupings formed through discussions with the public advisory committee.

The Recreation Emphasis, which consists of the largest portion of units, occupies 36% of the total Plan Area due to the predominance of Bute Inlet. Areas with this designation are often adjacent to areas favoured for commercial and personal recreation and tend to support conservation of important biological attributes which contribute to the overall quality of the recreation experience.

Conservation emphasis units, accounting for 21% of the total Plan Area, tend to reflect greater consideration for environmental attributes as they are predominated by or adjacent to significant marine and foreshore ecological values while tenure opportunities are relatively limited or guided by management recommendations.

The General Marine emphasis units, of which 16% of the total Plan Area is designated, tends to include a greater variety of potential uses, and therefore varies in potential environmental impact. General Marine Emphasis units include areas of lower biological diversity or Planning Units with a range of values from biological to community, none of which predominates the entire unit. General Marine units are typically available to a wide range of tenure programs while specific management recommendations serve to mitigate risks to more sensitive portions of the unit.

The Conservation/Recreation designation, which consists of 12% of the Plan, reflects areas where the preservation and management of existing recreation values may centre on certain biological and conservation values of which they depend.

The Community emphasis, accounting for 7% of the Plan Area, commonly contains a greater variety of multiple uses consistent with community infrastructure, and promotes the continuation of these uses and activities when associated with adjacent upland settlement areas.

The Community/General emphasis is similar yet may possess a wider range of tenured activities. The one Planning Unit designated as such, unit 7 Current-Race, contains the community of Sayward and experiences a large amount of commercial activity due to its location on the Johnstone Strait. This unit accounts for 6% of the total Plan Area.

#### ■ MITIGATIVE FACTORS ■

The Management Conditions for the Acceptance of Tenure Applications, the Tenure Approval and Management Guidelines and Required Action items

have been applied to each of the units within the Plan Area. These restrictions help to reduce the overall environmental risks of new tenured uses. In addition, the site-specific scale of the many government agency technical criteria for siting and compatibility assessments will further mitigate or avoid impacts to specific marine biological attributes from proposed developments.

The Plan identifies “conservation” uses as acceptable in all 20 Planning Units as well as recommending some areas for conservation assessment for possible marine protection. This means that *Land Act* reserves, notations of interest and protected areas, where indicated by conservation assessments during Plan implementation, would provide further opportunities to protect or conserve discrete areas of high biological and recreational value. These opportunities may therefore result in additional protection of values that cumulatively should help offset any unforeseen environmental risks associated with new tenures in the Johnstone-Bute Coastal Plan Area.

An additional benefit of the Plan is that proponents can determine from Plan maps where the sensitive environmental resources are, and therefore guide development accordingly to increase the likelihood of applications being approved (i.e. are likely to meet the technical siting and compatibility criteria).

Areas with few biological resources can be considered to be areas of low environmental risk for development. It is also expected that although in some cases applications may be made for operations that overlap sensitive areas, any risk would be reduced by the site-specific siting and compatibility requirements.

#### ■ ASSESSMENT SUMMARY ■

The Plan recognizes and accepts existing uses, but is a forward looking exercise primarily intended to reduce future problems and conflicts. Consequently, it cannot reduce environmental risk from current levels. The lack of data and inability to estimate the actual range and number of new tenures that would occur due to the recommendations of the Plan makes it difficult to quantify the possible effects of the Plan.

However, the mitigative effects of the Management Conditions for the Acceptance of Tenure Applications, the Tenure Approval and Management Guidelines and Required Action items as well as the opportunity for “conservation” uses and conservation assessments in this Plan may cumulatively offset or

reduce environmental risks over the Plan Area when compared against the absence of such a Plan.

## 4.2. Economic Implications of Recommendations

### ■ METHODOLOGY ■

The North Island Straits Coastal Plan, completed in late 2002, included an attempt to conduct an abridged multiple accounts analysis (MAA) as a means to assess economic implications of that Plan's recommendations. This method is used by provincial planning agencies and Crown corporations to systematically document and evaluate impacts from different perspectives or "accounts." The multiple accounts evaluation used in provincial Land and Resource Management Plans proved very difficult to employ because Plan recommendations cannot guarantee that an application will be made or that applications will be approved and result in new tenured developments. The assessment of the economic implications of the Johnstone-Bute Coastal Plan is limited in similar fashion to the North Island

Straits Plan, and will therefore rely largely on qualitative assessment.

The North Island Straits Coastal Plan presented a list of coastal uses and their anticipated economic effect (Table 21). While this data cannot readily be used to quantify the economic effects of the Johnstone-Bute Coastal Plan, it does illustrate the economic effect of the various uses contemplated by the Plan.

### ■ GENERAL ASSESSMENT ■

The Johnstone-Bute Coastal Plan designates uses as acceptable or acceptable at current levels if they are already tenured in a given Planning Unit. The Plan also recognizes and supports existing activities that are neither tenured nor managed by the Province (e.g. recreation activities) where they are known to occur. Therefore, the Plan affirms all existing uses and activities within the Plan Area, and along with them any current and projected economic benefits. However, the economic benefits of these uses, such as log handling and private moorage, are not attributed to the Plan's accounts.

Key Biological Attributes	Management Emphasis					
	Community (3)	Conservation (4)	General (4)	Recreation (5)	Conservation/Recreation (3)	Community/General Marine (1)
<b>Threatened/Endangered Species</b>						
Red listed species (# of species present)	8	5	6	7	4	1
Blue listed species (# of species present)	1	8	1	5	4	1
<b>Benthic Habitats</b>						
Estuary Wetlands (# of units present)	1	1	1	2	1	1
Eelgrass beds (# of units present)	3	3	4	4	3	1
Kelp beds (# of units present)	3	2	3	2	3	1
<b>Invertebrates</b>						
Intertidal clams (# of units present)	3	2	2	1	3	1
Prawn values (# of units present)	2	2	2	4	3	0
Sea cucumber (# of units present)	1	0	1	2	0	0
<b>Fish</b>						
Herring spawn (# of units present)	1	2	3	5	3	1
Salmon migration (# of units present)	1	1	2	3	3	1
Salmon streams (# streams)	11	9	13	5	7	3
Salmon Holding Areas (# of units present)	3	3	2	4	3	1
Groundfish values (# of units present)	2	2	2	5	4	1
<b>Birds</b>						
CWS area of interest (# of units present)	3	4	4	5	3	1
Eagles (# of units present)	2	1	2	5	2	1
<b>Sea Lions</b>						
Sea Lion haul outs (# of haul-outs)	4	1	1	5	3	1

In certain Planning Units, existing uses are designated as acceptable only at current levels. Applications in process prior to approval of this Plan are intended to proceed through the normal interagency referral process, which would consider existing siting policies and the guidelines in the Johnstone-Bute Coastal Plan. Alternative locations may have cost and profitability implications for planned and proposed uses which can have indirect employment, provincial revenue and community impacts. These impacts are not quantified due to their uncertain nature and a lack of readily available data.

The Johnstone-Bute Coastal Plan will primarily affect future uses and related economic development. Quantitative estimates of

the incremental impacts of the Plan for key commercial uses were not identified, as mentioned above, due to the speculative nature of determining future sites. The Plan may impose costs on certain aquaculture, commercial and industrial activities, particularly where uses are conditionally acceptable. However, since the Plan's main impact is to establish general direction for dealing with applications, rather than changing specific siting criteria, it is unlikely that these costs would be greater than under the current management regime.

In addition to the implications for specific coastal uses, the Johnstone-Bute Coastal Plan has some indirect socio-economic benefits that result from coastal planning that cannot be quantified. These include greater investor certainty and reduced capital and operating costs resulting from affirmation of existing uses and clearer management direction for new development, which should clarify the terms and conditions governing the siting approval process administered by LWBC. Reduction in resource conflicts is also an anticipated benefit that will result in sustainable economic development.

The proportion of new investment and employment opportunities that will accrue to communities and

residents of the Plan Area depends on the local sourcing of labour and materials, supplies and equipment. Local sourcing depends on factors such as the type of use, the proximity of the development to communities in the Plan Area, local production capacity and the hiring policies of tenure holders. Economic benefits of the Plan are expected to accrue to both the Plan Area and to communities in the surrounding area.

The above discussion applies to both First Nation and non-First Nation communities. Unemployment rates among First Nations are typically much higher than for non-aboriginal populations, and First Nations communities are much more reliant upon a mixed-subsistence economy which relies on marine food sources, particularly fisheries, to supplement household incomes or compensate for low incomes. Aboriginal harvests of marine resources are likely to remain important parts of the Aboriginal income stream in the Plan Area. The Plan encourages increased involvement with First Nations in economic activities, while respecting traditional resource based uses and activities. If properly implemented, the Plan should have positive economic implications for First Nations.

**Table 21. Economic Impact Coefficients for Selected Coastal Uses**

<b>Foreshore/ Nearshore Use</b>	<b>Capital Investment (\$'000/site)</b>	<b>Annual Direct Jobs (PYs/site)</b>	<b>Annual Total Jobs (PYs/site)</b>	<b>Annual Direct BC Revenue* (\$/site)</b>
Finfish Aquaculture	900	4.0	7.60	43,000
Shellfish Beach Aquaculture	150	0.9	1.60	9,700
Shellfish Deepwater Aquaculture	110	2.0	3.30	21,500
Marine Plant Aquaculture	6	2.0	3.3	21,500
Floating Lodges	1150	11.0	13.3	43,900
Commercial Rec. Base Camps	490	4.9	5.8	19,600
Heli-Log Drop Sites **	460	4.0	8.3	60,000
Log Sorts	850	1.5	3.1	22,500
Log Storage Pens	225	1.0	2.1	15,000
Public Docks and Wharves	56	1.8	3.6	26,000
Commercial Docks and Wharves	740	15.7	32.5	236,000
Tidewater Industrial	1300	47.8	58.3	121,000

Sources: North Island Straits Coastal Plan, MSRM, December 2002

\* Includes taxes on direct, indirect and induced incomes as well as direct LWBC lease/ rental fees.

\*\* Capital investment estimate for heli-log drop sites assumes 6 sites each operated for 2 months per year.

\*See Social and Economic Impact Assessment for Land and Resource Management Planning in British Columbia: Interim Guidelines, Integrated Resource Planning Committee, August, 1993. The guidelines for land and resource management planning are currently being reviewed and updated.



## SUMMARY AND FOLLOW-UP

## 5.1. Summary of Plan Recommendations

Table 22. Summary of Recommended Uses by Planning Unit

	Unit 1 – Port Neville	Unit 2 – Upper Johnstone	Unit 3 - Yorke	Unit 4 – Sunderland Channel	Unit 5 – Topaze Harbour	Unit 6 – Wellbore Channel	Unit 7 – Current - Race	Unit 8 – Chancellor Channel	Unit 9 – South Johnstone	Unit 10 – Philips Arm	Unit 11 – Nodales Channel	Unit 12 – Frederick - Estero	Unit 13 - Rapids	Unit 14 – Okisollo – Hole in the Wall	Unit 15 - Bute Entrance	Unit 16 - Lower Bute	Unit 17 - Orford	Unit 18 – Upper Bute	Unit 19 - Loughborough	Unit 20 – Mayne Passage
Shellfish Beach Aquaculture	O	X	X	O	X	O	O	O	X	X	O	X	X	X	X	X	X	O	X	✓
Shellfish Deep Water Aquaculture	X	X	O	O	✓	X	X	O	X	✓	O	O	X	X	X	X	X	O	O	✓
Finfish Aquaculture	X	X	O	✓	O	X	X	O	O	O	O	O	X	O	O	X	O	X	X	O
Marine Plant Aquaculture	X	X	X	X	X	X	X	X	X	X	O	X	X	X	X	X	X	X	✓	✓
Float Homes	✓	X	X	X	X	X	X	X	X	X	X	X	✓	X	✓	X	X	X	✓	X
Floating Lodges/Camps	✓	X	X	✓	X	✓	X	X	X	X	X	X	✓	X	✓	X	X	X	✓	O
Boat Launches	✓	✓	X	X	X	✓	✓	X	✓	✓	X	X	✓	O	✓	✓	X	X	X	✓
Commercial Recreation Guiding	✓	✓	✓	✓	✓	✓	O	✓	✓	O	O	✓	✓	✓	✓	O	O	O	✓	✓
Log Booming and Handling	✓	✓	✓	O	✓	O	✓	✓	✓	✓	O	O	O	✓	✓	✓	✓	✓	✓	✓
Helicopter Log Drops	✓	✓	✓	O	✓	O	✓	✓	X	✓	O	O	X	✓	✓	✓	✓	✓	✓	✓
Private Residential Moorage	✓	✓	X	✓	X	X	✓	X	✓	✓	X	X	✓	✓	X	✓	✓	X	✓	✓
Commercial & Industrial Docks	O	X	✓	X	X	✓	✓	X	✓	✓	X	X	✓	✓	✓	X	✓	X	✓	✓
Public & Institutional Docks	O	X	✓	X	✓	✓	✓	X	✓	✓	X	X	✓	✓	✓	✓	✓	X	✓	✓
Marine Telecommunications & Utilities	O	O	O	O	O	O	✓	X	O	O	X	X	O	✓	O	O	O	O	O	✓
Conservation/Recreation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Management Emphasis	T	C	CR	G	RC	R	CG	G	R	CR	C	C	R	T	G	R	R	C	G	T

Note: Management Emphasis: G=General Marine C=Conservation R=Recreation T=Community

✓	<b>Acceptable.</b> The use is considered appropriate. Applications for this use should be accepted for processing and evaluation. Acceptance of an application does not guarantee that a tenure will be approved by LWBC or meet local and federal government requirements
O	<b>Conditionally Acceptable.</b> The use is considered conditionally acceptable. New applications for this use should be accepted for processing and evaluation only if they meet the terms of relevant Conditions for Acceptance of Tenure Application: in the Plan.
X	<b>Not Acceptable.</b> The use is considered inappropriate. Applications for this use should not be accepted for processing and evaluation.

## 5.2. Information Limitations

The unit maps and unit direction presented in this Plan will be used by LWBC, potential applicants and the public to determine the acceptability of a Crown foreshore or nearshore application. Plan users should be aware of the limitations inherent in the Planning Unit descriptions and maps. While the maps and text for each unit outline known values and uses within each unit, they can only represent information available at the time of Plan preparation.

Consequently, this Plan cannot and should not replace LWBC requirements for site specific information to accompany an application.

Since the Planning Unit maps are available on the MSRM web site and are linked to all supporting maps and information sources within MSRM, they will be regularly updated and will therefore be of increasing value to LWBC and other users in such activities as plan auditing, plan amendment, site planning and marketing.

**Table 23. Summary of Foreshore/Nearshore Areas under Land Act Map Notation of Interest (NOI)**

Planning Unit	Specific Area	Purpose and Sponsoring Agency
1 Port Neville	Lower portion of inlet	Maintain log handling reserves on adjacent shores south of Robbers Nob in favour of MSRM.
2 Upper Johnstone	Neville Point and Milly Island	Maintain NOI for Towboat Reserve at Neville Point and Milly Island in favour of MSRM.
3 Yorke	McLeod Bay	Maintain NOI over McLeod Bay Boat Haven in favour of MSRM
	Fanny Island	Maintain NOI over Fanny Island.
4 Sunderland Channel	Shaw Point	Maintain NOI Towboat Reserve in favour of MSRM
6 Wellbore Channel	Head of Forward Harbour	Maintain Land Act Shellfish Reserve at the head of Forward Harbour in favour of MSRM
	Florence Point	Maintain NOI over Towboat Reserves (2) at Florence Point within Forward Harbour in favour of MSRM
	Thynne Peninsula	Establish NOI for conservation and protection purposes over marine waters from Maud Pt to Bessborough Bay consistent with upland candidate PA boundaries in favour of WLAP
	Douglas Bay	Maintain NOI over Boat Haven in Douglas Bay in favour of MSRM
7 Current–Race	Camp Point	Establish NOI for recreation purposes over waters adjacent to Camp Point Recreation site in favour of MOF.
	Helmcken Island–Billy Goat Bay and adjacent Bay	Maintain NOI over Boat Havens on Helmcken Island in favour of BC Parks
8 Chancellor Channel	West Thurlow	Maintain NOI over Towboat Reserve on West Thurlow Island in favour of MSRM
9 South Johnstone	Elk Bay, Little Bear Bay	Establish NOI for recreation purposes over waters adjacent to Elk Bay and Little Bear Bay recreation sites in favour of MOF
10 Philips Arm	Shirley Creek	Maintain UREP map reserve
11 Nodales Channel	John's Point	Establish NOI for recreation purposes over waters adjacent to John's Point Recreation site in favour of MOF.
	Thurston Bay Lagoon	Maintain NOI over Boat Haven in Thurston Bay Lagoon in favour of BC Parks
	Thurston Bay	Establish NOI over Thurston Bay for purposes of a conservation assessment for a potential protected area.
12 Frederick-Estero	Egerton Creek	Establish NOI for recreation purposes over waters adjacent to Egerton Creek Recreation site in favour of MOF.
	Frederick Arm	Maintain NOI over Towboat Reserve on eastern shore of entrance to Frederick Arm.
	Estero Basin	Establish NOI over Estero Basin (marine portion), up to and including 'the Cut' for further conservation assessment for a potential protected area.
13 Rapids	Dent Island, Burnt Bluff Bay	Maintain NOI over Tow Boat Reserves at Dent Island and Burnt Bluff Bay in favour of MSRM.
	Sonora Island	Maintain Land Act Research Reserve on Sonora Island at Innis Passage in favour of MSRM
14 Okisollo-Hole in the Wall	Hole in the Wall entrance	Establish NOI for recreation purposes over waters adjacent to Hole in the Wall Recreation site in favour of MOF.
	Florence Cove	Maintain NOI over Towboat Reserve at Florence Cove in favour of MSRM.
16 Lower Bute	Moh Creek	Maintain UREP map reserve
19 Loughborough Inlet	Beaver Inlet	Establish NOI for recreation purposes over waters adjacent to Beaver Inlet Recreation site in favour of MOF.
	Towry Head	Maintain NOI over Boat Havens (2) at Towry Head in favour of BC Parks

**Table 24. Summary of Areas Requiring Guidelines for Commercial Recreation Operating Practices**

Affected Area	Planning Unit 7
Participants & Process	<ul style="list-style-type: none"> <li>■ CWS,WLAP to develop guidelines and/or performance based standards with LWBC</li> <li>■ Tenure applicants to consult with appropriate agency as to availability of guidelines/standards</li> </ul>
Time Frame	■ Time frame for development established by agencies
General Content	<ul style="list-style-type: none"> <li>■ Location of sensitive species, types of species and habitat</li> <li>■ Species populations, lifecycle events e.g. breeding, rearing, feeding and migration</li> <li>■ Species sensitivities during activities e.g. noise disturbance during breeding</li> <li>■ Proposed operating activities and timing, distances</li> </ul>

**Table 25. Summary of Areas Requiring Guidelines for Commercial Recreation Operating Practices for Bear Viewing**

Affected Area	Planning Units 10,11,16,17,18,19
Participants & Process	<ul style="list-style-type: none"> <li>■ WLAP to develop guidelines and/or performance based standards with LWBC</li> <li>■ Tenure applicants to utilize current draft 'Guidelines and Tenure requirements for Land Based Bear Viewing' as developed by WLAP until finalized</li> </ul>
Time Frame	■ Time frame for development established by agencies
General Content	<ul style="list-style-type: none"> <li>■ Location of sensitive species, types of species and habitat</li> <li>■ Species populations, lifecycle events e.g. breeding, rearing, feeding and migration</li> <li>■ Species sensitivities during activities e.g. noise disturbance during breeding</li> <li>■ Proposed operating activities and timing, distances</li> </ul>

### 5.3. Summary of Recommendations for Land Act Notations

A summary of management prescriptions for *Land Act* notations of interest is provided in Table 23. In order for LWBC to place or maintain notations over these foreshore and nearshore areas, official letters of request will be required from WLAP and / or MOF.

### 5.4. Commercial Recreation Operating Practices Guidelines

Section 3.12 - Conditions for Acceptance of Tenure Application identifies Planning Units where commercial recreation guiding uses should be conditional on following established guidelines and / or performance based standards for bear viewing and minimizing disturbance and impact on bird colonies and migratory bird habitat. These units are summarized in Table 24 along with a recommended outline for development and scope of such guidelines.

### 5.5. Plan Variation Process

Plan provisions that identify a use in a Planning Unit as 'Not Acceptable' or 'Conditionally Acceptable' may be challenged on a site-by-site basis. This process to vary the Plan's recommendations must be made in writing to the LWBC Service Centre Director by the proponent.

LWBC should only accept a request for Plan variation if it is based on one or more of the following conditions, which are to be specifically addressed in the variation request letter:

- The proposed use is based on new technologies or methods of operation that were not available, not contemplated or not considered during development of the Plan;
- The proposed use represents, or is part of a new economic activity or venture that was not considered or contemplated during development of the Plan;
- The proposed use is based on new information that was not available at the time of plan development

Letters of support from local government and / or First Nations are encouraged in support of the variation proposal.

The recommended Plan variation process is as follows:

- The proponent provides a formal letter requesting Plan variation to the LWBC Service Centre Director, with relevant rationale and documentation, including geographic location of the proposal. A non-refundable fee will be levied by LWBC for accommodating the request.
- Within 15 days of receiving the variation request letter, LWBC will distribute it to a standing interagency resource management committee for consideration.

- The committee will review the variation request and make a recommendation to the LWBC Service Centre Director within 60 days of receipt of the letter from LWBC. The proponent may be requested to make a presentation to the interagency management committee. The committee will recommend acceptance or rejection of the variation request and any subsequent information required for inclusion in a tenure application if the request is upheld.
- LWBC will consider the recommendations of the committee and advise the appellant of the LWBC decision. If the decision is to accept an application, the proponent may complete the LWBC application form and the application will be processed according to LWBC standard procedures, subject to any other LWBC requirements or issues.
- LWBC acceptance and processing of an application based on a successful Plan variation request should not be interpreted as support for issuance of tenure by LWBC or the interagency management committee.

A successful Plan variation request will not automatically result in change to the Plan's acceptable use provisions for that unit. Permanent change to such provisions may, however, be made at the time of Plan review if there have been a large number of variation requests.

The variation process for the Johnstone-Bute Coastal Plan should be confirmed by the LWBC Service Centre Director and the MSRM Regional Director.

## 5.6 First Nation Contact and Considerations/Provisions

The Province considers First Nations involvement in reviewing Planning Unit recommendations as an opportunity to accommodate First Nations interests and information. Through such involvement, the Plan is intended to foster improved working relationships, reduced impact of land use activities on area First Nations' activities, and greater participation of area First Nations in economic development of resources.

As previously stated, the Plan is not binding on, and is not intended to limit treaty negotiations.

The Plan seeks to encourage tenure applicants to develop working relationships with area First

Nations. Such working relationships could include, but are not be limited to, discussions of the following:

- joint venturing or partnerships for development
- major First Nations involvement in operations
- training and employment of First Nations people in a development or tenure
- recognition and avoidance of applying for tenure in areas of significance to the First Nations
- use of First Nations support in marketing of a development or business
- guardian programs for marine conservation and recreation areas.

It is also recommended that non-tenured users of Crown foreshore and nearshore make efforts to engage area First Nations in discussion, where an activity is potentially in conflict or a source of friction with cultural values and sensitive sites.

## 5.7. Plan Review and Amendment

Three years from the anniversary date of Plan approval, the Ministry of Sustainable Resource Management (MSRM) will prepare an audit report on tenure applications and approvals that addresses the degree of compliance with the Plan. A listing of interpretation issues, Plan variation requests and any public comments received during the three year period, as well as recommended plan amendments,

**Table 26. First Nation Contact Information**

<b>Hamatla Treaty Society</b> 1441 Old Island Highway Campbell River, BC V9W 2E4 Ph: (250) 287-9460 Fax: (250) 287-9469	<b>Kwakwaka'wakw First Nation</b> 1440 Old Island Highway Campbell River BC V9W 2E3 Ph: (250) 286-1295
<b>Xwémalhkwu First Nation</b> #552 1218 Bute Cres. Campbell River, BC V9H 1G5 Ph: (250) 923-4979 Fax: (250) 923-4987	<b>Wei Wai Kai First Nation</b> PO Box 220 Quathiaske Cove Quadra Island BC V0P 1N0 Ph: (250) 285-3316
<b>Tlowitsis Nation</b> 106 1434 Island Highway Campbell River BC V9W 7Y8 Ph: (250) 830-1708 Fax: (250) 830-1709	<b>Wei Wai Kum First Nation</b> 1400 Wei Wai Kum Rd Campbell River BC V9W 5W8 Ph: (250) 286-6949
<b>Comox First Nation</b> 3320 Comox Rd Courtenay BC V9N 3P8 Ph: (250) 339-4545 Fax: (250) 339-7053	<b>Klahoose First Nation</b> 553 Box 9 Squirrel Cove, Mansons Landing, BC V0P 1K0 Ph: (250) 935-6536 Fax: (250) 935-6997



will be included in the report along with recommended actions or plan adjustments.

The audit report will be presented to the standing interagency committee chaired by MSRM. The committee will use this report as the basis of a formal Plan review, which may lead to the redrafting and reaffirmation of the Plan by government. The

process for redrafting or reaffirmation will include discussions with affected local government, First Nations, members of the planning advisory committee, boards associated with integrated oceans management, and interest groups. Any revised or modified Plan will be posted on the MSRM website.

## 5.8. Summary of Follow-up Activities

**Table 27. Summary of Schedule of Follow up Activities**

Sequence	Name of Activity	Initiation Date	Lead Responsibility
1	Official requests submitted from agencies for notations of interest	Dec 2004	WLAP & MOF
2	Establish notations and reserves	January 2005	LWBC
3	Develop operating guidelines/performance based standards for minimizing impact of tenure operations on bird colonies & migratory bird habitat	ongoing	LWBC with WLAP, CWS
4	Develop operating guidelines/performance based standards for minimizing impact of tenure operations on bears and bear habitat	ongoing	LWBC with WLAP
5	Prepare audit report & formal plan redraft (if required)	March 2007	MSRM
Ongoing	Planning Unit Variations	As Required	LWBC

## Appendix I: Governance Principles for Sustainable Resource Management

### VISION

Sustainable resource management that optimizes economic development of the province's natural resources while protecting ecosystem integrity, enhancing community well being and ensuring an enduring legacy of prosperity for future generations.

### GOALS

A strong, competitive and vibrant provincial economy

A supportive social infrastructure

Safe, healthy communities and a sustainable environment

Sound Governance

### PRINCIPLES

**Accountability:** Setting performance-based standards and indicators and implementing mechanisms for compliance, auditing and reporting on progress towards sustainable resource management. An effective enforcement regime is a key part of accountability.

**Certainty:** Making timely and clear resource management decisions within a predictable and understandable regulatory framework.

**Competitiveness:** Ensuring that British Columbia remains internationally competitive by removing barriers to investment and promoting open trade.

**Continual improvement:** Learning from the past and looking for new and improved approaches to resource management.

**Efficiency:** Maximizing the net benefits arising from the allocation, development and use of natural resources.

**Innovation:** Encouraging innovative approaches, technologies and skills to ensure the sustainability of natural resources.

**Integration:** Ensuring that resource management decisions integrate economic, environmental and social considerations for the benefit of present and future generations.

**Science-based decision-making:** Making justifiable decisions informed by science-based information and risk assessment.

**Shared responsibility:** Encouraging co-operation among First Nations; federal, provincial and local governments; industry and non-governmental organizations in developing and implementing resource management policies.

**Transparency:** Establishing open and understandable decision-making processes including consulting with key interests prior to making decisions. Transparency also includes the public release of monitoring and compliance records, and tracking of sustainability indicators.

## Appendix 2: First Nations, Agency, and Interest Group Discussions

Group, Agency, Nation, First Nation, Regional Government, and Community	Nature of Contact
<i>First Nations, Regional Government, and Community</i>	
Xwémalhkwu First Nation	Meetings (3); information exchange
Hamatla Treaty Society	Meetings (3); information exchange
Comox First Nation	Meeting (2); information exchange
Regional District of Comox – Strathcona Community Planning Committee	Board Meeting (4)
Regional District of Comox Strathcona Board	Board meeting (2)
Johnstone – Bute Coastal Plan Advisory Committee	Local meetings (6)
District of Campbell River	Board meeting (1)
<i>Industry</i>	
Sea Kayak Guide Alliance of BC	Meeting (1); information exchange
Pacific Halibut Management Association	Information exchange
Pacific Prawn Fisherman's Association	
Heritage Aquaculture Ltd.	Meeting (1); information exchange
Underwater Harvesters Association	Meeting (1); information exchange
Scott Paper	Information exchange
BC Shellfish Growers Association	Meeting (1); information exchange
BC Salmon Farmers Association	Meeting (3); information exchange
Timberwest Forest Ltd.	Meeting (1); information exchange
<i>Provincial and Federal Agencies</i>	
Canadian Wildlife Service	Information exchange
Fisheries and Oceans Canada	Meetings (ongoing); information exchange
Land & Water BC	Meetings (2); information exchange
Ministry of Agriculture, Food & Fisheries	Meeting (2); information exchange
Ministry of Forests	Meeting (1); information exchange
Ministry of Water, Land & Air Protection (Parks)	Information exchange
<i>Non-Government Organizations</i>	
Campbell River Sport fishing Advisory Council	Meeting (1); information exchange
Council of BC Yacht Clubs	Information exchange
Georgia Strait Alliance	Information exchange

**Figure 16 Submission of the Hamatla Treaty Society**

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**Submissions by the Hamatla Treaty Society on Behalf of its Member Nations to the British Columbia Ministry of Sustainable Resource Management for inclusion into the Johnstone-Bute Coastal Plan****Date of Submission: July 16, 2004****Introduction:** This Introduction Section is Applicable to All Unit Areas.

The member Nations of the Hamatla Treaty Society (HTS) are the We Wai Kai Nation, the Wei Wai Kum Nation, Kwiakah Nation, the K'omoks Nation and the Tlowitsis Nation. The first point that must be made clear is that HTS is not making representation for each of the individual member Nations. The input for the Johnstone Bute Coastal Plan must be provided directly from each of the member Nations. The purpose of HTS in this process is to provide general comments and expression of interests in the territories of the member Nations.

Each of the HTS Nations are participating in the British Columbia Treaty Commission (BCTC) process to negotiate a treaty with both British Columbia and Canada. In the BCTC process British Columbia has been informed of the traditional territories of each of the respective Nations. The submissions made in this submission are without prejudice to the BCTC negotiations. Additionally, our member Nations are proceeding on the basis that British Columbia has been informed of the member Nations interests throughout the territories and British Columbia will take into consideration all these interests when making any decisions over the natural resources within each of the traditional territories.

Each of the member Nations retain a strong interest in all marine resources throughout the territories. Many of the sea resources have become intimately incorporated into the cultural practices of each Nation and all citizens still rely on the well being of the sea resources. Many of the traditional practices and uses of these marine resources have been curtailed by decisions made by both the Federal and Provincial governments. Despite this curtailment, the interests and uses still remain a part of the daily lives of the citizens of the member Nations.

The present study and planning in this process seems to focus only on current uses and ignores the past uses and practices of our member Nations. The current uses do not reflect fully the needs and interests of the HTS Nations due to the denial of access and curtailment in uses. The aboriginal rights and uses are evolving and changing with the needs of society from time to time. The resources, however, has remained consistently incorporated in the culture and identity of the HTS Nations.

The HTS Nations have a strong interest in replenishing the traditional salmon and herring stocks within their territories. The HTS Nations rely on these species not only for food, social and ceremonial uses but for making a living from these



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resources. Access for the purpose of making a living has been denied by both the Federal and Provincial governments. The HTS Nations do take the position that no allocation of all marine resources should be made until the interests of the HTS Nations has been fully addressed.

Many activities in the territories have been allowed without consultation and accommodation of the HTS Nations. This has resulted in denial of access to many resources and severe conservation problems. Activities such as poor logging practices, fish farm developments, pulp mills and log handling facilities are examples of these activities. Consent should be provided by the respective HTS Nations before any activities of this nature are allowed.

There has been no accommodation nor compensation provided to the HTS Nations for the interference in the aboriginal rights. In many circumstances the denial of access and use of resources have been allowed to non aboriginal citizens. The HTS Nations' citizens have been in a large part regulated out of their traditional activities. This approach cannot be allowed to continue. This can be avoided by including the HTS Nations in governing all the natural resources throughout the territories. Priority to the HTS Nations for access and use should be an overarching principle of the Provincial government.

Finally, the Johnstone Bute Planning process cannot be regarded as consultation and accommodation for its member Nations. Much more time and resources will be required for each of the member Nations before a proper consultation and accommodation can be said to have happened.



**HOMALCO INDIAN BAND**

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**Submissions by the Xwémalhkwu First Nation  
to the  
British Columbia Ministry of Sustainable Resource Management  
for inclusion into  
The Johnstone-Bute Coastal Plan**

**Date of Submission: March 19, 2004; Revised August 11, 2004**

**Introduction**      This Introduction Section is Applicable to All Unit Areas

The information provided herein with respect to Xwémalhkwu First Nation<sup>1</sup> use of lands and waters within the area covered by the Johnstone-Bute Coastal Plan, and such recommendations based on that information, are provided subject to the reservation that such information must not be considered a complete description of either Xwémalhkwu First Nation traditional or current use of the areas depicted. Therefore, this document should not be considered an exhaustive listing of Xwémalhkwu interests within the Johnstone-Bute Coastal Plan area.

Xwémalhkwu First Nation is engaged in further work, with very limited resources, to catalogue the resources and areas of traditional and current use with the Xwémalhkwu First Nation asserted traditional territory and that work is not yet complete. Moreover, while Xwémalhkwu First Nation harvesting activities have suffered a serious decline in recent years for a variety of reasons including coercive pressure from the Crown forcing us to abandon traditional settlements, it cannot be assumed that extensive harvesting activity and the exercise of our aboriginal rights and title will not continue into the future.

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<sup>1</sup>Otherwise known as Homalco Indian Band.

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This information is also provided under reserve of Xwémalhkwa First Nation's position of holding Aboriginal rights and title throughout the Xwémalhkwa First Nation traditional territory. More specifically, the Xwémalhkwa First Nation asserts aboriginal rights to harvest the resources traditionally harvested throughout the areas of traditional use wherever those resources occur from time to time. In any event, Xwémalhkwa First Nation has an interest in all of the resources in the territory to which Xwémalhkwa First Nation holds aboriginal title. Any significant and potential impact on those resources is a significant impact on the Xwémalhkwa First Nation.

Further, neither aboriginal title nor the exercise of any aboriginal right, including harvesting right, can be categorized using site-specific processes solely. This is due to the fact that potential negative impacts may only be seen from a broader cumulative impact to the whole ecosystem and environment a particular resource needs to have to survive and flourish. It should be noted that traditional use sites and other Xwémalhkwa interests included here do not address river and stream shores which empty onto the foreshore. Further, some specific sites and some entire unit areas are designated by the Xwémalhkwa First Nation for particular protection, including: Rockfish Conservation Areas, Krill Conservation Areas, Salmon Enhancement and Protection Zones and Sites, Heritage Protected Sites and Zones.

Further, there are some areas, such as in Units 14 and 17 that do not appear to include geographic areas that include Xwémalhkwa interests, such as Quatum River, Waiatt Bay. Therefore, traditional uses and Xwémalhkwa interests may not be exhaustively reflected in this document, if these Unit Areas do indeed include these locations. In addition, there are some Unit Areas where information may overlap or be more applicable to another Unit Area. Xwémalhkwa First Nation has an interest in the protection of unimpeded access for Xwémalhkwa First Nation members, from now and into the future, to the traditional uses described herein, including all cultural, spiritual, and resource harvesting activities throughout the Johnstone-Bute Coastal Plan area that correspond with asserted Xwémalhkwa First Nation traditional territory. In other words, any tenured use or license of occupation that may potentially negatively impact on or interfere with an Xwémalhkwa First Nation member's ability to access or the ability to exercise Xwémalhkwa First Nation aboriginal rights and title must be avoided. In addition, existing tenure holders are





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on notice that any impediment to the exercise of Xwémalhkwu First Nation aboriginal rights and title within the traditional territory must be avoided.

In general, it appears that the Unit Area Summaries focus on existing resource uses. There is little consideration of historical uses and productivity, or of resource capability. Where resources are currently depleted, for example salmon in most of the areas, they are largely ignored. Since Xwémalhkwu has an interest in restoration of depleted stocks, an assessment of historical productivity and future potential of resources would be more relevant than current stock status. As a result, Xwémalhkwu First Nation has designated a number of specific areas and, on occasion, entire unit areas, as Xwémalhkwu Salmon Enhancement and Protected Zones.

All of the Unit Areas in the Johnstone-Bute Coastal Area may be used by salmon migrating to and from the Bute Inlet and other parts of the Xwémalhkwu traditional territory. The possibility of transmission of sea lice and other pathogens from salmon farms to wild salmon, especially out-migrant pinks and chums, is a serious concern to Xwémalhkwu and is under investigation by DFO and other researchers. Scientific evaluation of the problem only began in spring of 2003, and the data are not yet analyzed. Xwémalhkwu First Nation therefore recommends use of the precautionary approach, rather than the adaptive management approach and suggests not siting new salmon farms in the Plan Area until impacts on wild salmon are better understood. This recommendation also applies to the potential negative impacts to clam beaches and accompanying harvesting of these wild species. In fact, scientific research to study potential negative impacts of finfish aquaculture on clam beaches and harvesting productivity has already been noted through traditional ecological knowledge of First Nations located in coastal British Columbia, but scientific research into these effects has only begun to be investigated. Xwémalhkwu First Nation is also interested in investigating options for scientific research possibilities on this issue.

Xwémalhkwu First Nation recommends adding to management guidelines for every Unit Area that due to potential conflicting uses, present, and potential tenure holders of log storage and handling and light industrial tenures should be requested to provide mitigation measures created in consultation with Xwémalhkwu First Nation for potential negative impacts on conservation values, specifically marine resources and the accompanying necessary environment, such as





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clams and clam beaches, and salmon and salmon producing areas such as streams, rivers and migration routes. Specifically, log handling facilities should not be located in biologically sensitive areas that may be potentially negatively impacted by the accumulation of bark, wood fiber and other logging debris. Such potentially conflicting uses include clam beds, estuaries of salmon streams, juvenile salmon feeding areas, rockfish habitat, especially that of high relief rocky bottom. All of which, Xwémalhkwu First Nation has an interest in protecting, utilizing and enhancing. As such, Xwémalhkwu First Nation has designated a number of specific areas, and on occasion entire unit areas, as Xwémalhkwu Rockfish Conservation Areas. Further, plans should incorporate strategies for the necessary remediation as a result of past damage to salmon fishery and clam harvesting, attributable to these tenures. In addition, no further tenures should be granted unless and until proponents can provide evidence that no harm will come to the interests described above, or other interests noted herein.

Xwémalhkwu First Nation recommends that any finfish aquaculture or deepwater shellfish culture, proposed to be located in protected, exposed and high current areas in any Unit Area may potentially conflict with, and therefore must be considered in light of Xwémalhkwu First Nation interests in protecting safe anchorages for Xwémalhkwu First Nation members to continue to have the ability to practice their aboriginal rights, necessarily entailing the continued access of safe anchorages within the traditional territory for members. Further, Xwémalhkwu First Nation recommends that prior to considering these uses acceptable in any Unit Area, proponents should be obliged to provide confirmation that such tenures will not alter beach structures or alter or add sediment to fish bearing streams, or affect other cultural interests as described herein.

Xwémalhkwu First Nation recommends that any in Unit Area where there exists evidence of traditionally utilized clam beaches and digging areas, these beaches should be examined for the existence of clam gardens by a professional archaeologist working in consultation with the BC Archaeology Branch and the Xwémalhkwu First Nation prior to considering uses as conditional or acceptable near or on these sites. On this note, and due to the numerous traditional use sites of particular importance, Xwémalhkwu First Nation has designated a number of sites, and some entire units, to be Xwémalhkwu Heritage and Protected sites or zones.





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Xwémalhkwa First Nation recommends adding to the management concerns section in every Unit Area that existing finfish tenures be removed or limited to fallowing use for an existing operation to be relocated to allow recovery of the sea bottom community below the original site, but only so far as the specific location does not, also, have the same salmon migration, clam beach, etc. conflicts as the initial site. In other words, finfish salmon farms should be fallowed (farmed salmon removed) during periods when wild salmon (especially smolts and juveniles) are in the vicinity. Pens should be fallowed long enough prior to anticipated presence of wild juveniles that residual infectious stages of sea lice (larvae) would not be present in the area when wild fish arrive.

Xwémalhkwa First Nation recommends that the definition, of 'significant' as used in the siting criteria throughout the Johnstone-Bute Coastal Plan, which include any portion of the Xwémalhkwa First Nation traditional territory, when describing whether rivers, creeks and waterways are 'significant', or have a 'significant' presence of fisheries values, Xwémalhkwa First Nation's position is that this definition must also include whether the Xwémalhkwa First Nation may consider such streams, rivers, waterways, or the presence of marine resources in these waterways, as 'significant'. In other words, when deciding whether a waterway, or its productivity is 'significant', Xwémalhkwa First Nation must be consulted as to whether a particular waterway or area has 'significant' marine resource presence from the Xwémalhkwa First Nation perspective. For example, every stream which has, whether in the past or the present, historically supported salmon spawning, is significant to Xwémalhkwa First Nation and this position is based on historical use, the consideration of production capability as indicated by historic returns, as well as the fact that small streams may be important in the long term as repositories of genetic diversity.

In addition, Xwémalhkwa First Nation recommends that siting criteria used throughout the Johnstone-Bute Coastal Plan, by the provincial and federal governments must be more inclusive of the potential for negative impacts to Xwémalhkwa First Nation values, in both a cumulative, and site specific manner. For example, the arbitrary siting distances do not take into consideration the potential negative impacts on values located very close to, but not within the recommended distance limits. Further, this type of site-specific evaluation will not take into





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consideration the potentially negative cumulative impacts of siting such uses within an area where there are sensitive ecosystems.

Specific concerns include the potential negative impacts site specific acceptable uses will have on salmon migration routes, clam beaches, restoration and enhancement of declining or conservation stocks, rockfish, in particular. Further, buffers should be determined on site-specific criteria, including the circulation patterns at a particular location. There should also be a specific category for rockfish habitat, as these species are not restricted to rocky bottoms. Therefore, Xwémalhkwa First Nation recommends that until and unless unbiased science, including the use of traditional ecological knowledge, establishes that no potential negative effects to the above Xwémalhkwa First Nation interests will result, Xwémalhkwa First Nation cannot approve or recommend the existing siting or buffer criteria, as used by the provincial and federal governments and reflected in the Johnstone-Bute Coastal Plan, and therefore the conditional or recommended approval of such uses as outlined in the Plan.

Xwémalhkwa First Nation has an interest in all known clam beaches in the traditional territory, and any use that may potentially negatively impact on the productivity of this resource cannot be recommended unless and until unbiased baseline studies are completed which result in conclusive proof that any particular use will not negatively impact upon this resource and its necessary environment.

Xwémalhkwa First Nation recommends adding to management guidelines for every Unit Area that existing finfish tenure holders should create mitigation plans in consultation with Xwémalhkwa First Nation which will address potential negative impacts on Xwémalhkwa First Nation interests, which may include the investigation of scientific research and baseline studies carried out in conjunction with traditional ecological knowledge to be completed prior to a use being acceptable which might potentially negatively impact upon Xwémalhkwa First Nation interests, as outlined in this entire document.

In addition, finfish aquaculture concerns exist regarding potential conflicts with the health of outmigrant smolts, especially pink and chum; clam beaches and other marine resources relied upon traditionally and currently by Xwémalhkwa First Nation members. Therefore this should





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not be an acceptable use in any Unit Areas unless and until unbiased science carried out by an source independent of government and possible proponents is provided which proves that the specific distance criteria used for siting will have no effect on Xwémalhkwa First Nation fisheries interests, especially salmon outmigrant smolts and clams. Before applying for any modifications, tenure holders should develop mitigation plans, in consultation with Xwémalhkwa First Nation to reduce or eliminate any potential negative impacts modifications may have on the health of outmigrant smolts, especially pink and chum, clam beaches and other marine resources relied upon traditionally and currently by Xwémalhkwa First Nation members.

Finfish aquaculture farms should not be located in any Unit Area that is regularly used by wild salmon due to possible disease transfer from farm to wild or vice-versa. In particular, farms should not be located on migration routes used by outmigrant salmon smolts or in feeding areas used by young juveniles due to the threat of transfer of sea lice from farm fish to small and vulnerable wild ones, especially pinks and chums, which are smaller than other species at the time of migration. The history and capability of wild stocks in the inlet should be considered when evaluating potential negative impacts on wild stocks in relation to acceptable uses, especially aquaculture tenures. Therefore, existing finfish tenures in any Unit Area should be removed if they potentially conflict with these migration routes.

Finfish farms should not be located in any Unit Area over critical rockfish and lingcod habitat. They should be only recommended if they are located far enough from such critical habitat that nutrient enrichment from the fish farms do not negatively impact on bottom habitat. The assessment of potential negative impacts should be site specific and should consider, among other things, size of facility, currents, and bottom topography. However, they should not consider status of rockfish and lingcod stocks presently, as these are likely to be depressed due to over fishing.

In all Unit Areas, the traditional harvest of timber species, particularly cedar and fir, for the construction of shelters, paddles, canoes, and other cultural purposes occurs from the foreshore and nearshore. Pitch from lightning damaged fir trees is a traditional harvest practice used for numerous purposes including lighting, patching canoes and medicinal purposes. Xwémalhkwa First Nation has an interest in protecting these traditional uses.





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Generally speaking, the foreshore and nearshore in Unit Areas 6 to 11 are particularly important Xwémalhkwa First Nation traditional harvesting and gathering sites for numerous plant species used for medicinal, food and other cultural purposes. Access to these harvesting sites is from the shoreline.

Xwémalhkwa First Nation has an interest in the kelp resources found within the traditional territory. In addition, Xwémalhkwa First Nation has an interest in the protection of hemlock and cedar species located on the foreshore and nearshore, in all Unit Areas in the traditional territory.

Xwémalhkwa First Nation would also note that an integrated approach to natural resource management, especially as regards the coastal zone, should be used rather than further segregation of jurisdiction and management, and notes that it is encouraging that the federal and provincial governments appear to be moving towards a more holistic approach to management of the resources, as has always been practiced and recommended by Xwémalhkwa First Nation. However, participation and guidance by the people who are most strongly affected by any management decisions, whether these be using an integrated approach or not, is necessary. Therefore, Xwémalhkwa First Nation recommends that the provincial and federal governments work with the Xwémalhkwa First Nation at a high level planning stage, with the equal participation of Xwémalhkwa First Nation as the use of the conservation approach to resource use has historically been our primary concern. Further, it may be that Xwémalhkwa First Nation approval and consent is necessary prior to making higher level planning decisions, especially when considering activities and planning which may potentially negatively impact upon Xwémalhkwa First Nation aboriginal rights and title interests to the traditional territory and the continued exercise of aboriginal rights, including unimpeded and continuing access to resources. Finally, Xwémalhkwa First Nation has an interest in participating in all of the economic development occurring within the traditional territory and it is our position that we have the right to derive economic benefits from the utilization of all resources in the present and into the future in the traditional territory.

Finally, Xwémalhkwa First Nation notes that the consultation terms and the time frame imposed upon the Xwémalhkwa First Nation by the Province when we were asked to participate in the Johnstone-Bute Coastal Plan was not adequate in terms of limited resources and time, to provide



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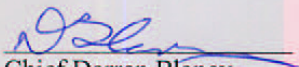
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the type of integrated and comprehensive response and recommendations document the Xwémalhkwu First Nation would have preferred to provide for the Provincial Ministry of Sustainable Resource Management.

The following sections, provided on a Unit Area by Unit Area basis, are therefore provided with the proviso that further and more comprehensive work and consultation, for any use in the traditional territory, is necessary, before the Xwémalhkwu First Nation would consider such uses acceptable, or conditionally acceptable.

Respectfully submitted, on behalf of the Xwémalhkwu First Nation, this 19<sup>th</sup> day of March, 2004, and resubmitted on this 11<sup>th</sup> day of August, 2004 by:

  
Chief Darren Blaney  
Xwémalhkwu First Nation



## Xwémalhkwa (Homalco) First Nation Unit Specific Comments and Recommendations

### UNIT 1 PORT NEVILLE

- Xwémalhkwa First Nation asserts this Unit Area is within Xwémalhkwa First Nation traditional territory.
- Port Neville is a traditional clam harvesting area. The Fulmore River/ Shore Creek estuary in particular is a known clam harvest area. Fulmore River supports coho, pink, chinook and sockeye. Sockeye escapement is of significance, regionally, having the 3rd largest median escapement in the traditional territory. In addition, chum escapement is also significant, as it is the 12th largest median escapement out of 92 chum streams in Xwémalhkwa traditional territory.
- Port Neville is a traditionally used safe anchorage and stopping place, in particular, where the government wharf and store is situated.
- Xwémalhkwa recommends that Port Neville Inlet should be a Rockfish Conservation Area, as originally recommended as part of the FOC Rockfish Conservation Strategy. Port Neville Inlet is an Xwémalhkwa Rockfish Conservation Area.
- Potential negative impacts exist in relation to log handling tenures on salmon and clams in this Unit Area, as described in the Introduction.

### UNIT 2 UPPER JOHNSTONE

- Xwémalhkwa First Nation asserts that this Unit Area is within Xwémalhkwa First Nation traditional territory.
- Traditional gill netting harvest of salmon species, including chum, pink and coho is noted for this Unit Area. Xwémalhkwa First Nation traditionally harvests rock cod, lingcod, and sockeye and spring salmon in this Unit Area. Hunting sites for deer and grouse on the shoreline accessed by a boat are throughout this unit. Xwémalhkwa First Nation recommends that any use, which may potentially damage these historic stocks, be investigated before approval of its use in this Unit Area.
- The entire unit area is an Xwémalhkwa Salmon Enhancement and Protection Zone.

### UNIT 3 YORKE

Xwémalhkwa First Nation asserts that this Unit Area is within Xwémalhkwa First Nation traditional territory.

- There is a conflict regarding finfish aquaculture, specific to this Unit Area. Aquaculture capability is listed as good to medium from Point George to Gunner Point and on northern shores of Fanny Island, Clarence Island and Yorke Island. The management conditions recommend finfish aquaculture applications to be restricted to Tuna Point. However, attributes include anadromous fish streams at Tuna River, and this area is also considered to be part of the FOC Proposed Rockfish Conservation Area. These values conflict with finfish aquaculture use. Tuna Point to Vancouver Island and Hardwicke Island is an Xwémalhkwa Rockfish Conservation Area.
- Xwémalhkwa First Nation recommends that the area from Tuna Point across to Vancouver Island (RCA 138) NW Hardwicke Island should be a Rockfish Conservation Area, as originally recommended as part of the FOC Rockfish Conservation Strategy. The above recommendation is particularly pertinent and important to the Xwémalhkwa First Nation due to the traditional gill net harvest of salmon species, including chum, pink and coho. Xwémalhkwa First Nation recommends that any use potentially damaging historic stocks be investigated before approval of its use in this Unit Area. The entire area is an Xwémalhkwa Salmon Enhancement and Protection Zone.
- Hunting of deer and grouse on the shoreline has been traditionally practiced from a boat.
- Yorke Island is a traditionally used safe anchorage site.

### UNIT 4 SUNDERLAND CHANNEL

- Xwémalhkwa First Nation asserts that this Unit Area is within Xwémalhkwa First Nation traditional territory.
- Plum Creek at the west end of the north side of Hardwicke Island supports chum, pink and coho salmon.
- NW Hardwicke Island is an Xwémalhkwa Rockfish Conservation Area and Xwémalhkwa First Nation recommends that NW Hardwicke Island (RCA 137) should be a Rockfish Conservation Area, as initially recommended as part of the FOC Rockfish Conservation Strategy.
- West of Althorp Point is an Xwémalhkwa Salmon Enhancement and Protection Zone. There is a

resource and user conflict regarding the health of out migrant smolts, especially pink and chum, clam beaches and other marine resources relied upon traditionally and currently by Xwémalhkwu First Nation members as the finfish tenure is located west of Althorp Point, where there also exists extensive kelp beds, known to be areas of refuge for smolts, and rockfish.

- The above recommendation is particularly pertinent and important to the Xwémalhkwu First Nation due to the traditional gill netting harvest of salmon species, including chum, pink and coho and spring and sockeye. Lingcod, rock cod, red snapper is also harvested in this Unit Area. Xwémalhkwu First Nation recommends that any use, which may potentially damage these historic stocks, be investigated before approval of its use in this Unit Area.

#### UNIT 5 TOPAZE HARBOUR

- Xwémalhkwu First Nation asserts that this Unit Area is within Xwémalhkwu First Nation traditional territory.
- Xwémalhkwu First Nation traditional harvesting in this Unit Area includes late runs of chum salmon at Topaze Harbour, and salmon harvest in Read Creek, in particular. Read Creek has historically been a significant producer of pinks, chums and coho; stocks for the latter two species are currently extremely depressed, but could potentially recover. Xwémalhkwu First Nation has an interest in protecting and enhancing existing stocks in this Unit Area.
- Traditional harvest also includes sea urchins, clams and crabs in Topaze Harbour, and in Jackson Bay in particular. In fact, Jackson Bay is a traditional harvesting and smoking site for various species including dog salmon and clams. In addition, historically, there exists an overland trail to Heydon Bay at Topaze Harbour. This overland trail to Heydon Bay is an Xwémalhkwu Heritage Protection site. Protection of the commencement of this overland trail is recommended for historic purposes. Hunting of deer and grouse on the shoreline from a boat is also a traditional practice in this Unit Area, as is the harvest of berries by the foreshore and nearshore.
- Topaze Harbour is an Xwémalhkwu Rockfish Conservation Area. Resource use conflicts exist within this Unit Area, specifically, the biological attributes listed, the proposed Rockfish area and

Xwémalhkwu First Nation interests in marine resources. These uses conflict with the finfish aquaculture tenure between Shaw Point and Geneste Point. Further, Xwémalhkwu First Nation recommends Topaze Harbour (RCA 136) become a Rockfish Conservation Area, as recommended as part of the FOC Rockfish Conservation Strategy.

- This entire unit area is an Xwémalhkwu Salmon Enhancement and Protection Zone. There is a major resource and user conflict regarding this area if finfish tenures are to remain.
- There is a further conflict regarding finfish aquaculture, specific to this Unit Area, as the harbour has been identified as having poor circulation with stratification leading to potential phytoplankton blooms.
- Xwémalhkwu First Nation recommends that due to the biological and ecological attributes, as well as conservation concerns and recreational use, this Unit Area management emphasis should be changed to recreational or conservation.

#### UNIT 6 WELLBORE CHANNEL

- Xwémalhkwu First Nation asserts that this Unit Area is within Xwémalhkwu First Nation traditional territory.
- Traditional clam harvesting by Xwémalhkwu First Nation occurs throughout this Unit Area. Traditional marine resource harvest in this Unit Area includes rockfish, lingcod, rock cod, red snapper, sea urchins, sea cucumber, and all species of salmon.
- Due to the high recreational values, cultural values and biological attributes, including the protection area designations and the Rockfish Conservation Area issue, Xwémalhkwu First Nation recommends that this area be listed as having a conservation emphasis.
- Forward Harbour is an Xwémalhkwu Rockfish Conservation Area. Xwémalhkwu First Nation recommends Forward Harbour (RCA 135) as a Rockfish Conservation Area.
- Xwémalhkwu First Nation recommends adding to biological attributes that Wortley Creek has a regionally significant even-year pink salmon escapement, as it is the fifth largest in the traditional territory.
- Xwémalhkwu First Nation has placed an Xwémalhkwu Salmon Enhancement and Protection Zone over all anadromous fish streams in this unit area.



## UNIT 7 CURRENT-RACE

- Xwémalhkwa First Nation asserts that this Unit Area lies within Xwémalhkwa First Nation traditional territory.
- Traditionally, at the mouth of xwésam, otherwise known as Salmon River, a shared village site was located. Xwémalhkwa First Nation has an interest in protecting and examining this site. Therefore, uses that may potentially negatively impact this site cannot be recommended.
- The mouth of Salmon River is an Xwémalhkwa Heritage Protection Site. In addition, Salmon River is a very important stream with moderate chum, and regionally significant coho, pink and chinook production which Xwémalhkwa First Nation has an interest in enhancing and protecting. Salmon River is an Xwémalhkwa Salmon Enhancement and Protection Zone.
- Xwémalhkwa First Nation recommends that the management emphasis be changed from general marine to conservation due to the high cultural values, biological attributes and protection area designations, including the DFO proposed Rockfish Conservation Area (RCA 138), the migratory bird habitat, the Salmon River estuary, and marine resource conservation and restoration concerns. These values may potentially conflict with the light industrial tenure and log handling tenures at Kelsey Bay, which is a traditional clam, herring, and herring eggs, crab, cockle, and lingcod harvest area. Xwémalhkwa First Nation members have also traditionally hunted ducks, geese, grouse and other waterfowl within Kelsey Bay.
- SW Hardwicke Island is an Xwémalhkwa Rockfish Conservation Area. Xwémalhkwa First Nation recommends SW Hardwicke Island be a Rockfish Conservation Area, as originally recommended as part of the FOC Rockfish Conservation Strategy.

## UNIT 8 CHANCELLOR CHANNEL

- Xwémalhkwa First Nation asserts that this Unit Area lies within Xwémalhkwa First Nation traditional territory.
- Traditional use includes a village site, hunting for deer and grouse, and harvest for rock cod, lingcod, red snapper, at Greene Point on West Thurlow Island and on the mainland across Cordero Channel from Greene Point. Thus, Greene Point and the Mainland across from Cordero Channel are both Xwémalhkwa Heritage Protection sites.

- Traditional use includes fishing for rockfish and lingcod, halibut, coho, spring, chum, pink salmon throughout this Unit Area, as well as clam digging all along the coast of West Thurlow Island. Xwémalhkwa First Nation therefore recommends that these areas be protected, and further potential negative impacts to wild clam harvest be noted with regards to any shellfish beach or any aquaculture applications. Traditional harvest of berries and other plant species near the foreshore is noted. In fact, this entire unit area is an Xwémalhkwa Salmon Enhancement Zone.

## UNIT 9 SOUTH JOHNSTONE

- Xwémalhkwa First Nation asserts that this Unit Area lies within the Xwémalhkwa First Nation traditional territory.
- Traditional use values include village and clam harvest in Little Bear Bay, and traditional food harvesting of huckleberries and other plant life in Elk Bay, south of Chatham Point. Lingcod and rock cod, red snapper, salmon, including sockeye is traditionally harvested in this Unit Area. Village sites are located near river and creek mouths, as these sites are areas where harvesting of plant species and hunting of deer, grouse and other species occurs, as well as marine harvesting, noted above. Therefore, Xwémalhkwa First Nation recommends that these areas be protected from uses that may potentially conflict or negatively impact upon these traditional uses. Little Bear Bay is an Xwémalhkwa Heritage Protection Site.
- Amor de Cosmos Creek has historically been a significant producer of chum, coho and pink salmon. All of these stocks are currently depressed, but a high capability must be considered in order to retain options for rehabilitation. Xwémalhkwa First Nation has an interest in rehabilitation and enhancement of these stocks. As such, all historic salmon producing streams, including Amor de Cosmos creek, have been designated Xwémalhkwa Salmon Enhancement and Protection Zones.
- Xwémalhkwa recommends that no uses be accepted in this Unit Area, which would potentially negatively impact upon whale migrations as Homalco Wildlife Tours, an eco-tourism company owned by the Xwémalhkwa First Nation, conducts tours that include the whale migrations.

- Due to the potential conflicting resource values, including Xwémalhkwu First Nation fisheries interests, the overall high salmon and ground fishery values, the high public recreation values on Cinque Islands, and all of the other biological attributes located in this Unit Area, Xwémalhkwu First Nation recommends no finfish aquaculture tenures for this Unit Area.
- The above recommendation is especially pertinent when considering the fact that the aquaculture capability notation of "good" for the Walkem Islands, directly contradicts the Xwémalhkwu First Nation recommendation that Knox Bay (RCA 70) be a Rockfish Conservation Area, as originally proposed as part of the FOC Rockfish Conservation Strategy. Xwémalhkwu First Nation further recommends the original DFO recommendation prohibiting rockfish commercial fishing in the Johnstone Strait proposal. Xwémalhkwu First Nation has an interest in enhancing and restoring rockfish populations, thus any tenure, which may potentially negatively impact upon these efforts, cannot be supported. As such, the area around East Thurlow Island, including the Walkem Islands and Knox Bay is an Xwémalhkwu Rockfish Conservation Area.
- Xwémalhkwu First Nation would also request further information regarding the Commercial A tenure at Little Bear Bay, and would recommend that any use of this tenure that may be granted be subject to the provision of mitigation plans created in consultation with Xwémalhkwu First Nation to provide for potential negative impacts on Xwémalhkwu First Nation marine resource interests in the area which may result, especially clam harvesting.

## UNIT 10 PHILLIPS ARM

- This Unit Area is located within the traditional territory of Xwémalhkwu First Nation.
- Traditional use includes the harvest of cockles, crabs, sea urchins, and fall fishing of chum salmon throughout this Unit Area and at the head of Phillips Arm, in particular, which is a traditional hunting and village area. A traditional overland route/trail exists beginning at the head of Phillips Arm, up the Phillips River, ending at Bear Bay in Bute Inlet. Xwémalhkwu First Nation has an interest in the protection of this historical route.
- Fanny Bay, and Shirley Creek, west of Phillips Arm,

are tradition fishing and village sites. In particular, chinook salmon has been harvested at Fanny Bay; however, Fanny Bay Creek also produces chum, pink and coho.

- The Phillips River is a very significant pink salmon producer, and it is also one of the very few significant sockeye rivers located in the traditional territory. Historically it has accounted for nearly 40% of the recorded sockeye escapement to all the streams of the territory. Every year, pink salmon escapements since 1996 have ranged from 96,000 to 500,000 with an average of 252,000, as per DFO NUSEDS database. It is also the top sockeye producer in the traditional territory and has significant production of all other salmon species: chum, coho, and chinook.
- Wild onions and deer hunting is traditionally practiced at Owen Point. Therefore, Xwémalhkwu First Nation recommends that no use be permitted in this Unit Area which may potentially conflict with these traditional uses, and that these areas be protected for such use in the present and future. The head of Phillips Arm, Fanny Bay, Shirley Creek and Owen Point are Xwémalhkwu Heritage Protection sites.
- In addition, Phillips Arm has traditionally been used by Xwémalhkwu commercial fisherman to harvest chum.
- Xwémalhkwu First Nation has an economic interest in keeping this Unit Area pristine and aesthetically pleasing, as Homalco Wildlife Tours uses this corridor for eco-tours.
- The existing aquaculture tenures at Richard Point may potentially negatively impact upon migrant pink and other species in Phillips Arm, which Xwémalhkwu First Nation has an interest in protecting and enhancing. Phillips River is an Xwémalhkwu Salmon Enhancement and Protection Zone.
- Xwémalhkwu First Nation would also request further information regarding the light industrial tenure at Philips River, and would recommend that any use this tenure may be granted, be subject to the provision of mitigation plans created in consultation with Xwémalhkwu First Nation to provide for potential negative impacts on biological attributes and Xwémalhkwu First Nation interests in the area which may result. Specifically, there is a concern that this tenure may potentially negatively impact upon salmon stocks.
- Xwémalhkwu First Nation notes that there are considerable resource conflicts located in this Unit

Area. Xwémalhkwa First Nation recommends that the management emphasis for this area be changed from general marine to conservation due to the attributes listed, especially the Phillips River Estuary, the migratory bird habitat, as well as Xwémalhkwa First Nation cultural and marine resource interests located in the Unit Area.

- Phillips Arm is an Xwémalhkwa Rockfish Conservation Area. Further Xwémalhkwa First Nation recommends that Phillips Arm be a Rockfish Conservation Area (RCA 132), as originally recommended as part of the FOC Rockfish Conservation Strategy.
- Existing log handling sites at Fanny Bay and Phillips Arm at the head of the inlet may potentially impact upon rivers and creeks and salmon using those systems, especially during migration and early rearing as noted in the Introduction.

## UNIT II NODALES CHANNEL

- Xwémalhkwa First Nation asserts that this Unit Area is within Xwémalhkwa First Nation traditional territory.
- Traditional marine harvesting includes red snapper, rockfish, lingcod, and clams throughout this Unit Area, but in particular Thurston Bay, Chameleon Harbour and Burgess Passage. Traditional sockeye harvest occurs in late summer/fall.
- There are clam harvest sites at Thurston Bay, Burgess Passage and Chameleon Harbour.
- Traditional fishing sites include several small streams in the large bay on the west side of Sonora Island, encompassing Young Passage, Thurston Bay and Chameleon Harbour which are also village sites. Nodales Channel is a traditional area for fishing during any kind of weather, even harsh weather, especially for sockeye salmon.
- In addition, there exists a traditional trail, which begins at Chameleon Harbour and ends at Nutcracker Bay. Xwémalhkwa recommends that uses in this Unit Area not potentially conflict with these traditional uses, potential archeological evidence located in these areas, as well as enhancement and continued use of the marine resources mentioned above. As such, the trailhead starting at Chameleon Harbour to Nutcracker Bay is a Xwémalhkwa Heritage Protection site, as are the village sites at stream heads in large bay on west side of Sonora Island encompassing Young Passage, Thurston Bay, Chameleon Harbour and Hemming Bay.
- Xwémalhkwa First Nation recommends the designation of conservation, as proposed, but notes that the following resource potential conflicts exist with respect to conservation values: 5 finfish aquaculture tenures and a log handling reserve in Hemming Way. These potentially conflict with a conservation emphasis, and with the attributes and activities occurring in this Unit Area, as further described in the Introduction section.
- Specifically, Xwémalhkwa First Nation notes that tenures in Broughton Point and Jackson Point potentially conflict with the FOC Proposed Rockfish Conservation Area, which Xwémalhkwa First Nation recommends, as proposed, as well as the restoration and enhancement concerns of Xwémalhkwa First Nation marine resource interests. Further, Broughton Point to Jackson Point is an Xwémalhkwa Rockfish Conservation Area.
- Under Biological Attributes, the anadromous fish streams in Hemming Bay, Thurston Bay should be expanded to include Chameleon Harbour Creek, Hemming Bay creek, and Thurston Bay creek, as all these three creeks support chum, pink and coho salmon.
- There is an Xwémalhkwa Salmon Enhancement and Protection Zone encompassing the entire large bay on the west side of Sonora Island encompassing Young Passage, Thurston Bay, Chameleon Harbour and Hemming Bay.
- In light of the above conservation emphasis and the resource conflicts, which would result with further tenures potentially conflicting with this emphasis, Xwémalhkwa First Nation recommends that no new log handling, log sorting, commercial or industrial uses should be considered for this area.
- Specifically, the log handling reserve at Hemming Bay may potentially conflict with salmon using Hemming Bay creek. This creek formerly supported a moderate coho population, however, there has been a reduction in escapement since 1983. Xwémalhkwa would request information as to the history of log handling at this site to verify these potential negative impacts.
- Finally, Xwémalhkwa First Nation recommends that no uses be permitted in this Unit Area that may potentially conflict with whale migration routes, as Homalco Wildlife Tours, an ecotourism company owned by the Xwémalhkwa First

Nation, has an economic interest in the protection of this valuable resource for tourism purposes. Further, Xwémalhkwu First Nation has an interest in the protection of the area adjacent to Thurston Bay Provincial Park. Xwémalhkwu First Nation has an interest in the protection of the lakes connected via Hemming River and the mouth of this River. Finally, Xwémalhkwu has an economic interest in pursuing shellfish tenures in Chameleon Harbour.

## UNIT 12 FREDERICK-ESTERO

- Xwémalhkwu First Nation asserts that this Unit Area is within Xwémalhkwu First Nation traditional territory.
- Under biological attributes add that Estero Creek supports salmon.
- Traditional use includes villages in Frederick Arm and Estero Basin as well as harvest of foreshore plant life including blackberries and black caps, and yellow cedar, marine harvest of clams, lingcod and dogfish and hunting deer, bear, mountain goat and grouse.
- Further, Estero Peak and the trail up to it from the foreshore is a culturally significant area as it is the subject of a flood story for the Xwémalhkwu people.
- Estero Basin is a traditional trail and canoe portage area for Xwémalhkwu members as an overland route from Bute Inlet to Frederick Arm that shortens the trip from Orford Bay/Fawn Bluff and allows the traveller to avoid Arran and Dent Rapids. As a result, Xwémalhkwu First Nation recommends that no use be accepted in this Unit Area, particularly in Estero Basin, which might potentially conflict with the above uses. Xwémalhkwu First Nation has therefore designated the head of Estero Basin, including the trails to Bute Inlet and Estero Peak as Xwémalhkwu Heritage Protection Sites, as are the village and harvesting sites with Estero Basin and Frederick Arm.
- Xwémalhkwu First Nation recommends the designation of conservation, as proposed, but notes that the following resource uses potentially conflict with conservation interests: 2 finfish aquaculture tenures, a log handling tenure, a log handling reserve. These potentially conflict with a conservation emphasis, and with Xwémalhkwu First Nation conservation, enhancement and use interests in this Unit Area. This is especially pertinent when considering that finfish aquaculture capability rating is 'good or medium' along the eastern shore of

Frederick Arm while this area is also an Interim FOC Restricted Fishing Area. Xwémalhkwu First Nation recommends retaining this designation as a Restricted Rockfish fishing area. Frederick Arm is designated as an Xwémalhkwu Rockfish Conservation Area.

- In light of the above conservation emphasis and the resource potential conflicts which would result with further tenures potentially conflicting with this emphasis, Xwémalhkwu First Nation recommends that no new log handling, log sorting, commercial or industrial uses should be considered for this area.
- Under biological attributes, anadromous fish streams at Estero entrance and within the Basin, the following should be added: Frederick Arm Creek has historically supported chum, coho and pink salmon.
- Beach aquaculture for clams and oysters within Frederick Arm may potentially conflict with Xwémalhkwu First Nation interests in wild clam populations in this area. Xwémalhkwu First Nation has an economic interest in shellfish tenures in this unit area.
- The existing finfish aquaculture tenures at the western shore of the entrance should be assessed for possible sea lice impact on out migrant juvenile salmon. Acceptability of finfish aquaculture tenures on the eastern shore of the entrance should be re-evaluated for possible sea lice impact on out migrant juvenile salmon. This is further described in the Introduction section.

## UNIT 13 RAPIDS

- Xwémalhkwu First Nation asserts that this Unit Area is within Xwémalhkwu First Nation traditional territory. Traditional use is quite extensive within this Unit Area.
- Under areas of ecological significance, the following should be added: the high current, complex shoreline and predominately rocky bottom makes this an intensely productive area for salmon, rockfish, lingcod and invertebrates.
- As this Unit Area is very important for Xwémalhkwu traditional harvesting of marine species, overuse and conflict among uses is already an issue. For example, over fishing of endangered rockfish by recreational and commercial fisheries is already an issue. Therefore, Xwémalhkwu First Nation recommends that any additional uses, especially finfish or shellfish tenures, should be



viewed with great caution. It should also be noted that this Unit Area is a center for commercial fishing.

- Traditional harvesting includes rockfish, lingcod, sea cucumber, barnacles, and mussels at Arran Rapids. Red snapper is traditionally harvested on the east side of Arran Rapids.
- A traditional summer hunting site for mountain goat can be found at a large whirlpool located at the northern entrance of Dent Rapids.
- Mountain goat hunting sites can also be found just north of a culturally important rock, located 100-120 feet up from the shore on the south side of the creek emptying into the Inlet.
- Further, the beach area in a bay south of Dent Island in Innes Passage is a traditional village site where plant life harvest, including salmon berries, bilberries and stink currants, has been noted.
- Marine harvest at Yuculta Rapids includes red snapper, spring salmon, lingcod, and hake, as well as clam harvest on the west side of these rapids.
- Rockfish, lingcod, edible blue mussels and octopus are traditionally harvested at Big Bay. And Dogfish harvest sites exist north of Kelsey Point.
- Wild onion harvest sites include a tiny island between the western point of Innes Passage and the eastern point of Gillard Island.
- A traditionally important site is Sea Lion Rock, visible at flood tide at a large whirlpool south of the creek and south of Hamilton Point. There is also a legend related to salmon harvest concerning the distinctive rock face on the cliffs south of Hamilton Point.
- On the east shore of Sonora Island, one mile south from Sea Lion rock is a village, fishing, and hunting site, as well as harvest site for clams and other shellfish.
- Dogfish, sea cucumber, octopus and clam harvest occurs at two small bays, closest to Kelsey Point. There is a traditional village, fishing and hunting site at the grassy beach at Vancouver Bay.
- Southwest of Stuart Island at the government wharf near Harbott Point a permanent winter village was located, and this location is also a traditional hunting site. Forty-fifty feet from this site is a big rock that is tied to Xwémalhkwa traditional mythology.
- Xwémalhkwa First Nation therefore recommends that no use be accepted in this Unit Area that may potentially negatively impact on the traditional uses and marine resources mentioned above.
- In fact, Vancouver Bay, Harbott Point and all village sites at Innes Passage and on Sonora Island are designated Xwémalhkwa Heritage Protection sites.
- Clam and oyster beach aquaculture may potentially conflict with Xwémalhkwa First Nation interests in maintaining traditional clam harvest beds around Dent Island and Horn Bay and with Xwémalhkwa First Nation future interest in shellfish tenures in those areas.
- Xwémalhkwa First Nation notes that this Unit Area presently has a management emphasis of recreation with a guideline that any applications for tenures should minimize potential negative visual impacts. It is also noted that the finfish aquaculture rating is listed as good or medium from Haro Point west to Gomer Island.
- Due to the obvious potential negative visual impacts which would result if aquaculture farms were located in this Unit Area, as well as the potential negative impacts on the biological attributes, Xwémalhkwa First Nation salmon, (as this area is a major migration route for juvenile chums and other salmon migrating from Bute Inlet streams), ground fish and clam interests, among others, Xwémalhkwa First Nation recommends adding to management conditions that finfish aquaculture should not be an acceptable use, further described in the Introduction section.
- Xwémalhkwa First Nation has a very strong traditional use interest in this area, especially for rockfish, lingcod, sea urchins and sea cucumbers, clams and salmon. This entire unit area has been designated as an Xwémalhkwa Rockfish and Lingcod Conservation Area and as an Xwémalhkwa Salmon Enhancement and Protection Zones. It is a heavily used area for targeted live rockfish fishery, however it is not designated as a Rockfish Conservation Area.
- In light of Xwémalhkwa First Nation interests in conservation and restoration of marine resources mentioned above, and the potential resource conflicts resulting from new or further tenures potentially conflicting with this emphasis, Xwémalhkwa First Nation recommends that no new log handling, log sorting, commercial or industrial uses should be considered for this area.
- In addition, Xwémalhkwa First Nation recommends adding to management guidelines that existing commercial wharves tenure holders should provide mitigation plans developed in

consultation with Xwémalhkwu First Nation to provide for potential negative impacts on Xwémalhkwu First Nation marine resource interests in the Unit Area that may result.

#### UNIT 14 OKISOLLO - HOLE IN THE WALL

- Xwémalhkwu First Nation asserts that this Unit Area is within Xwémalhkwu First Nation traditional territory and extensive traditional use sites have been recorded.
- Under areas of ecological significance, at the mention of extensive kelp beds throughout the channel with salmon bearing streams within Owen Bay, the following streams should be added: Chonat Bay, Waiatt Bay, St. Aubyn Creek, which is west of Walters Point.
- Under attributes, Waiatt Bay should be added as an anadromous fish stream. Further, Owen Bay has traditionally supported chum and coho salmon, as has Chonat Bay. St. Aubyn Creek has supported chum, coho and pink. Waiatt Bay has supported chum and coho.
- Small Inlet; confirm in or out of Unit Area as Xwémalhkwu traditional use has not been specifically itemized for this Inlet in this submission as it appears not to be in the Unit Area. However there is traditional use information for this location.
- Waiatt Bay is a traditional village site, harvest site for rock cod, crabs, spring, chum, pink salmon, seal, and plant materials including sea weed, salal, huckleberries, salmon berries, yellow cedar and nettles.
- Florence Bay is a village site and harvest site for clams.
- Chonat Bay is a village site and harvesting site for butter clams, seals, chum and coho salmon, and as a location for smokehouses. The creek at the east end of Chonat Bay is a traditional place to harvest coho salmon.
- Hole in the Wall is a traditional harvesting site for red snapper, rockfish, lingcod, and spring salmon.
- North of Walter's Point is a traditional harvest site for chum salmon.
- Owen Bay is a traditional harvest site for crab, oyster, clam, chum salmon and lingcod.
- Barnes Bay is a traditional harvest site for crab, clams, chum and other marine resources, as well as a village site. Okis Island is a traditional harvest site for seal.
- A stream draining St. Aubyn lake, in the little bay between Owens and Barnes Bay has traditionally been a very productive fish harvest, smoking, and village site.
- Both sides of the shoreline opposite Florence Bay at Hole in the Wall is a traditional deer hunting location. Rock piles near the shore exist which provide evidence of clam gardens, which Xwémalhkwu recommends being further studied, as described in the Introduction section. These locations are Xwémalhkwu Heritage Protection sites, as are the village sites at Florence Bay, Waiatt Bay, Chonat Bay, Owens Bay, Barnes Bay and the shoreline areas between Owens and Barnes Bay.
- Above the shoreline in this Unit Area, the traditional harvesting of plant products occurs, including many species of berries, and the harvest of cedar.
- Xwémalhkwu First Nation cannot recommend any use which may potentially negatively impact on the above traditional uses and harvest of marine and plant resources. Xwémalhkwu First Nation has a cultural interest in the protection of any traditionally harvested plant species, including old cedar growth and berry bushes. Further, Xwémalhkwu has an interest in protecting the traditionally used places for villages and fish processing. As a result, Xwémalhkwu First Nation cannot recommend any use that may negatively impact upon these uses.
- Xwémalhkwu First Nation also has an economic interest in protecting known clam beds in this Unit Area.
- In addition, Xwémalhkwu First Nation makes the following further recommendations and observations. Xwémalhkwu First Nation notes that the finfish aquaculture rating is listed as good or medium within Hole in the Wall at Florence Cove, yet this same area contains attributes including a seal and sea lion haul out, an Orca migration route, its importance for coastal and marine birds, extensive use by the ecotourism industry, and navigational challenges resulting in the high currents and narrow channels.
- Xwémalhkwu First Nation recommends that the capability status of finfish aquaculture for Florence Cove be reassessed in light of the above potentially conflicting uses including traditional food harvesting activities carried on by members.
- Commercial and recreational fisheries for endangered rockfish and lingcod potentially conflict with Xwémalhkwu traditional use and restoration plans of these species. This entire unit is an Xwémalhkwu Rockfish and Lingcod Conservation Area.
- Beach aquaculture may potentially conflict with traditional harvest in areas not yet recorded. Clam

harvest areas include Waiatt Bay, Owens Bay, Barnes Bay and Chonat Bay. Uses that may potentially conflict or detrimentally affect these traditional harvest sites should not be recommended. Xwémalhkwu has an economic interest in shellfish tenures in the entire unit area.

- Xwémalhkwu First Nation recommends adding to management conditions that Finfish aquaculture tenures for salmon at Barnes Bay and opposite Chonat Bay, potentially conflict with Xwémalhkwu traditional harvesting and may threaten outmigrant salmon smolts that use this as a migration route due to sea lice transfer. As St. Aubyn Creek and Owens Bay are salmon bearing streams, salmon migration routes would take the salmon directly past the existing finfish tenure opposite Chonat Point.
- In light of Xwémalhkwu First Nation interests in conservation and restoration of marine resources mentioned above, and the potential resource conflicts resulting from new or further tenures conflicting with this emphasis, Xwémalhkwu First Nation recommends that no new log handling, log sorting, commercial or industrial uses should be considered for this area. Further, this entire unit area is an Xwémalhkwu Krill Enhancement and Protection Zone, and salmon bearing streams in the unit area are Xwémalhkwu Salmon Enhancement and Protection Zones.
- In particular, Xwémalhkwu First Nation recommends that the log handling tenure located at Barnes Bay be reviewed for potential negative impacts to traditional clam harvesting sites at this location. The present tenure holder should provide mitigation plans, developed in conjunction with Xwémalhkwu First Nation, to eliminate any potential negative impacts to clam beaches at this location.
- In addition, Xwémalhkwu First Nation recommends adding to management guidelines that existing log handling tenure holders within Okisollo Channel and Barnes Bay should provide mitigation plans developed in consultation with Xwémalhkwu First Nation to provide for potential negative impacts on Xwémalhkwu First Nation marine resource interests in the Unit Area which may result, especially with regard to salmon fishery spawning enhancement efforts and clam bed protection. Further, plans should incorporate strategies for the necessary remediation as a result of past damage to salmon fishery and clam harvesting, attributable to these tenures.

## UNIT 15 BUTE ENTRANCE

- Xwémalhkwu First Nation asserts that this Unit Area is within Xwémalhkwu First Nation traditional territory. This Unit Area is in the heart of Xwémalhkwu traditional territory, and as such, extensive traditional use sites and features have been recorded.
- Xwémalhkwu First Nation notes that under activities and features, a village site is listed at Church House and the wharf is listed as publicly tenured. Xwémalhkwu First Nation has an interest in these public tenures.
- Traditional use includes harvest of clam beds on the east side of Stuart Island, and the harvesting of clams, lingcod, lingcod eggs, blue mussels, perch, sea cucumber, shrimp, and urchin and plant harvest on Bartlett Island. In addition, gravesites are located on this island. North of Honeymoon Bay and south of Bartlett Island is a transformation rock and accompanying water spring/well which is connected to Xwémalhkwu mythology, and which Xwémalhkwu First Nation has an interest in protecting.
- Honeymoon Bay, which is southeast of Bartlett Island, is a traditional village site with gardens and also a harvest site for lingcod, red snapper, rockfish, herring and salmon.
- North and south of the creek draining into Mitchell Lake was a permanent village site, with dwellings located on the shoreline.
- At Old Church House, located for its always-plentiful marine harvest capabilities, traditional harvest includes red snapper, rockfish, spring, coho and pink salmon, deer hunting, and cultivation of and harvest of fruit trees and berries.
- Beside Old Church House is a culturally important landmark, a hole in the wall, which is called Raven's Chamber Pot.
- At New Church House, also located for its always plentiful marine harvest capabilities, harvest includes rockfish, lingcod, herring, oyster, red snapper, perch, blue mussels, sea cucumber, clams, crabs, sea urchins, pink, immature Coho and spring salmon, lingcod eggs, octopus and kelp. In the whole bay, point-to-point, these resources have been harvested. Further, berry patches, roots and a selection of fruit trees have traditionally been nurtured at this location.
- North of Old Church House there is an overhanging tree, Tatnit, which has been used as a

navigational point. North of this tree is a creek that is a fish bearing stream.

- At Johnstone Bluff, as well as north and south of this location, is a harvest site for clams, red snapper, salmon, lingcod and lingcod eggs.
- A pictograph is located 15 feet above the high water mark north of Kwitlítap Bay which is on the east side of Bute Inlet, at the western tip of Johnstone Bluff, 1.3 miles northeast along the shoreline. Clams have traditionally been harvested at this location, as well as berries and other plant materials.
- A small creek on the eastern portion of Kwitlítap Bay is the location referred to in connection with an Xwémalhkwa myth concerning a dog-monster. This site has also been a good hunting site for deer and mountain goats, and marten.
- This whole Unit Area is a salmon migration route and a lingcod spawning area and as such, this whole unit area has received the following designations: Xwémalhkwa Krill Conservation Area and an Xwémalhkwa Salmon Enhancement and Protection Area.
- Xwémalhkwa First Nation therefore recommends that the above noted traditional use sites and resources be protected and that no uses be considered acceptable which will potentially conflict or may potentially negatively impact upon the exercise of Xwémalhkwa aboriginal rights in relation to these resources and locations. As such, this entire unit is an Xwémalhkwa Heritage Protection Zone.
- Xwémalhkwa First Nation also has an economic and tourism development interest in this Unit Area, including an interest in securing shellfish tenures.
- Xwémalhkwa First Nation notes that the finfish aquaculture rating is listed as good or medium within waters offshore of Church House and a portion of the southern shore of Stuart Island, yet the southeastern shore of Stuart Island is a FOC Proposed Rockfish Conservation Area, and a Xwémalhkwa First Nation reserve is located at Church House. In addition, the whole area is used for commercial and sports fisheries. Xwémalhkwa First Nation recommends that this entire Unit Area be a Rockfish Conservation Area. This entire unit is an Xwémalhkwa Rockfish and Lingcod Conservation Area
- Xwémalhkwa First Nation has an economic interest in the tourism potential of Church House and Old Church House.
- Finfish aquaculture capability listed for south shore of Stuart Island may threaten rockfish habitat inside

and outside of the Proposed Rockfish Conservation Area 96, as well as may potentially conflict with traditional harvest of rockfish, finfish and shellfish species.

- In particular, Xwémalhkwa First Nation notes that the finfish aquaculture tenure at Johnstone Bluff conflicts with the traditional clam harvest at nearby beach, and may detrimentally negatively impact migrant smolts with sea lice, as further described in the Introduction section.
- Xwémalhkwa First Nation recommends adding to management conditions that the existing finfish tenure south of Johnstone Bluff be removed, as further described in the Introduction section.
- The entire Bute Inlet is subject to strong, freezing outflow winds in winter, and can also occur in the other seasons. These 'Bute Winds' are a major hazard to public navigation, and the few areas of shelter from the winds may be a matter of life or death. Any tenure which (i.e. finfish or deepwater aquaculture) would have to be located in such sheltered areas, would conflict with public navigation as well as may potentially negatively impact on Xwémalhkwa fishery interests, as well as the ability of Xwémalhkwa members to practice preferred means of harvesting all traditional fish, animal and plant species, and the continued practice of traditional activities carried on throughout the Inlet.
- Xwémalhkwa First Nation is concerned that beach and offshore shellfish aquaculture and finfish aquaculture may interfere with traditional harvest and the continued exercise of Xwémalhkwa First Nation aboriginal rights to harvest marine species in this Unit Area. Xwémalhkwa First Nation recommends comparing the capability mapping with the traditional use data. Further, existing and potentially acceptable finfish tenures in this Unit Area may present a potential conflict with the traditional harvest of chum and pink salmon that migrate from major spawning areas in Bute Inlet. These concerns are further described in the Introduction section.
- In light of Xwémalhkwa First Nation interests in conservation and restoration of marine resources and the potential resource conflicts resulting from new or further tenures potentially conflicting with this emphasis, Xwémalhkwa First Nation recommends that no new log handling, log sorting, commercial or industrial uses should be considered for this area.



- In addition, Xwémalhkwa First Nation recommends adding to management guidelines that existing log handling tenure holders south of Bartlett Islets provide mitigation plans developed in consultation with Xwémalhkwa First Nation to provide for potential negative impacts on attributes in the Unit Area which may result, especially with regard to salmon fishery spawning enhancement efforts, the traditional harvest sites of shellfish and finfish and the important kelp beds located there.

## UNIT 16 LOWER BUTE

- Xwémalhkwa First Nation asserts that this Unit Area is within Xwémalhkwa First Nation traditional territory, and extensive traditional uses and sites have been recorded.
- Ecounit profile, under exposure (fetch) should be changed to maximum.
- Xwémalhkwa First Nation is not certain whether Ramsay Arm is part of this Unit Area. Traditional use sites have not been inserted for this location. However, if it is, Xwémalhkwa First Nation recommends that Quatam River be recommended as an area of ecological significance as it is a large river and estuary, and there is salmon and shellfish habitat in the sand flats off the mouth.
- Quatam River should be noted under Biological Attributes as a major salmon stream.
- Traditional use includes the harvest of chinook, coho and blue back, generally in the Inlet and red snapper and lingcod on the east side of Arran Rapids.
- Traditional harvest of coho and spring salmon occurs in the bay on the east side of Stuart Island.
- Fawn Bluff is a traditional harvest site for clams, and red snapper. In addition, this bluff is a village site and shelter. It is also the location of an underwater passage from Ramsey Arm for killer whales.
- The bay south of Fawn Bluff is a harvest site for coho, chinook, chum, pink, red snapper, lingcod, clams and cockles. There are also two creeks of significant and continuing cultural importance south of Fawn Bluff that are 8-10 feet apart. The bay on the beach below Fawn Bluff is a harvest site for clams and cockles. North of Fawn Bluff is an intertidal harvesting site, village and hunting location. The second creek northeast of Fawn Bluff is a village site, as well as a harvest site for passing stocks of eulachon.
- Amor Point, particularly southwest of the point, is a village location.
- On the bluffs along Lawrence Point, known as Look Out Point, oral history indicates that this was the sight of inter-national battles. North of Lawrence Point is a traditional harvest site for lingcod.
- Moh Creek is a village, hunting, plant harvesting and marine harvest site, in addition to being a safe anchorage. Marine harvest includes chum salmon, and lingcod south of the Creek, which is also an Xwémalhkwa burial ground.
- Xwémalhkwa First Nation notes that an UREP is listed at Moh Creek, and seeks clarification of this point, as an Xwémalhkwa graveyard is located at Moh Creek that Xwémalhkwa has an interest in protecting.
- At Kigichtn, otherwise known as Curly's Camp, the first spring salmon has been traditionally harvested, which is at the Bute Inlet side of Estero Basin and is the end of the trail to Estero Basin.
- Traditional marine harvest at Clipper Point includes spring salmon. Specifically, the second creek north east of Clipper Point is a marine and medicinal plant harvesting location. In addition, the first creek south of Clipper point is a particularly important harvesting site for medicinal and spiritual plants, which are of great importance to Xwémalhkwa culture. The first bay and creek east of Clipper Point is a traditional canoe-landing place. In fact, this entire unit area is an Xwémalhkwa Heritage Protection Zone, particularly important areas include Moh Creek, Look Out Site, Curly's Camp, Fawn Bluff, and Clipper Point.
- Takalh Bay, on the east side of Stuart Island, near the north grassy end, is a village, plant harvesting and fishing location, particularly for spring and coho salmon.
- The second bay and creek south from Orford Bay, of a particular V shape, is a traditional legend site, as well as a hunting site and water collection source.
- From Johnstone Bluff to Fawn Bluff, to Orford Bay, traditional marine harvest includes salmon, lingcod, red snapper, and rockfish. This stretch of water is also a migration route for salmon.
- Black bears use the whole Unit Area, on all shores. Grizzly bears are to be located at all river mouths. Xwémalhkwa First Nation has an interest in the protection of the habitat for both black and grizzly bear, as Homalco Wildlife Tours provides eco-

tourism ventures for tourists all along this Unit Area. Thus, any use which may potentially negatively impact on the habitat necessary to the well being of both black and grizzly bears is not recommended.

- This area is in the heart of Xwémalhkwu First Nation traditional territory, including traditional fisheries for salmon, rockfish, lingcod and shellfish. This entire unit area has been designated as an Xwémalhkwu Salmon Enhancement and Conservation Area and Rockfish Conservation Area. It is also an Xwémalhkwu Krill Conservation Area. Thus, Xwémalhkwu First Nation interests in conservation and restoration of these marine resources and the potential resource conflicts resulting from new or further tenures potentially conflicting with these interests, Xwémalhkwu First Nation recommends that no new log handling, log sorting, commercial or industrial uses should be considered for this area.
- Xwémalhkwu First Nation also has an economic interest in the tourism potential of this unit area.
- As uses may potentially conflict with Xwémalhkwu traditional fisheries of rockfish and restoration of these species as well as Xwémalhkwu First Nation concerns about over harvesting of rockfish and lingcod in commercial and recreational fisheries, Xwémalhkwu recommends that no uses in this Unit Area should be recommended which potentially conflict with the Proposed Rockfish Conservation areas including all of the North Eastern shore of Stuart Island and from Alpha Bluff including all of the inlet north of that level. In addition, Xwémalhkwu First Nation recommends that rockfish conservation be the priority for the area of lower Bute above Lawrence Point, as initially recommended as part of the FOC Rockfish Conservation Strategy.
- Xwémalhkwu First Nation recommends that existing finfish tenures south of Leask Creek be removed, as further described in the Introduction section.
- The entire inlet is subject to strong, freezing outflow winds in winter. These 'Bute Winds' are a major hazard to public navigation, and the few areas of shelter from the winds may be a matter of life or death. Any tenure which (i.e. finfish or deepwater aquaculture) would have to be located in such sheltered areas, would conflict with public navigation as well as potentially negatively impact on Xwémalhkwu fishery interests, as well as the

ability of Xwémalhkwu members to practice preferred means of harvesting all traditional fish, animal and plant species, and the continued practice of traditional activities carried on throughout the Inlet.

- Xwémalhkwu First Nation has concerns regarding finfish aquaculture as potential conflicts exist with Xwémalhkwu First Nation's interest in the health of outmigrant smolts, especially pink and chum. Xwémalhkwu First Nation has an interest in protecting traditional marine resources utilized by Xwémalhkwu members in the past, present and into the future.

## UNIT 17 ORFORD

- Xwémalhkwu First Nation asserts that this Unit Area is within Xwémalhkwu First Nation traditional territory. Extensive traditional use sites have been recorded.
- Xwémalhkwu First Nation recommends that Orford River and tributaries should be listed as major salmon streams as chum, coho, pink and chinook and steelhead have traditionally been harvested abundantly from these locations despite the fact that currently these locations are depressed, as Xwémalhkwu First Nation has an interest in the restoration of these streams for salmon production. Sockeye salmon has also been traditionally harvested.
- Ecounit profile, under exposure (fetch) should be changed to maximum.
- Activities and Features should include Pete Taggares Homalco Hatchery located at Orford Bay and owned by the Xwémalhkwu First Nation and the traditional Xwémalhkwu First Nation salmon fishery. The entire unit area has been designated a Xwémalhkwu Salmon Enhancement and Conservation Area, particularly around Orford Bay, Paradise River, Moh Creek and Bear River.
- On the west side of Bute Inlet, approximately 6 km due north of Amor Point, is a mountain traditionally used for cultural purposes and for hunting. Access to this mountain is from the shoreline. Distinct Xwémalhkwu family hunting areas cover all of Bute Inlet.
- The gravel beach and creek south of Paradise River is a village site. A mountain goat watering place and traditional hunting ground is located on the western shore of Bute Inlet, 8 km north from Amor Point, between the gravel beach and Paradise River. Village and hunting sites are located at Paradise River. The Xwémalhkwu First Nation has an economic interest in this area as well, including the shoreline and river.

- A distinctive rock crevice in a bluff on the western shoreline of Bute Inlet, approximately 4.8 km south of Alpha Bluff, is a historic deer jump that Xwémalhkwu First Nation recommends protecting. At a creek north of Alpha Bluff are distinctive rocks that resemble a picture of overturned canoes. Xwémalhkwu legend states that these are canoes transformed into rock. They are above the high-water mark. South of Alpha Bluff on a point is a village and deer hunting site, where there were lots of alder trees. There is a creek 1.9 km south of Alpha Bluff; in the deepest bay below Alpha Bluff that is thought to be where herrings spawned as the translated name is stench along the riverbank. A traditional nearshore mountain goat hunting area is situated at a distinctive cliff with striped markings approximately 1.7 km northwest of Alpha Bluff. Where a creek enters the west side of Bute Inlet approximately 4.4 km north of Alpha Bluff, south of Boyd Point, is a hunting site as there is a natural corral at the base of the mountain.
- There is a distinctive steep bluff located on the east side of Bute Inlet, in a small bay at the second stream before Hovel Bay. This location is used for strength training and testing for the effectiveness of Indian Hellebore as part of a young man's cultural rites to manhood and is a mountain goat hunting site.
- A village site is located at Hovel Bay on the east side of Bute Inlet, used while hunting. It is also strength training and testing area for young men.
- A distinctive point of land on the east side of Bute Inlet about 4 km north from the northern entrance to Orford Bay is of cultural significance to Xwémalhkwu members.
- A bay and rock reef area along the east side of Bute Inlet approximately 2.7 km north from the northern entrance to Orford Bay is a traditional seal hunting area as one can crawl inside and wait until the seals came through.
- There is a distinctive rock formation just above the high water line on the eastern shoreline of Bute Inlet approximately .6 km northwest from the northern entrance to Orford Bay. This location is a traditional transformation place, and Xwémalhkwu legend states that this rock is one of the three dogs of xwx7xw that were transformed in different locations within the Xwémalhkwu traditional territory.
- There are numerous burial grounds located around the northern point, up to the second creek closest to Orford Bay. In particular, on the inner point of the north side of the Orford Bay shoreline, near the eastern boundary of the Homalco Reserve is a burial ground of both rock crevasse burials and underground burials. At this place, up until the 1950's, wooden structures were visible to mark these sites.
- There is a pictograph located along the northern shoreline of Orford Bay in a bay at the point just before the Orford River on a cliff partially hidden by trees located twenty feet above the high tide mark. Xwémalhkwu First Nation has an interest in protecting all of the pictographs located in the traditional territory. There are several located within this Unit Area.
- There is a gully that runs from the inner shore, extending from the northeastern corner of Orford Bay all the way north to the mountain. This location has been a traditional harvesting site for medicinal and culturally used plant species including plants used for strength. It is also a traditional hunting area.
- Traditional marine fisheries at Orford Bay include red snapper, rock cod, lingcod, lingcod eggs, herring, perch, hake, flounders, seal and crab. Xwémalhkwu First Nation recommends that no commercial crab fishery should be allowed at Orford Bay due to the devastating decrease in productivity traditional knowledge evidences. A traditional winter village site was located at Orford Bay, on the south side of the Orford River mouth. Near here, there is a tiny creek like a slough used to collect water. A type of fish trap was located here near the river mouth with a rock corral. Traditionally, this has also been a place to smoke fish. Traditional plant harvesting within this bay includes cranberry marshes, salmon berries, wild fruit trees, black caps, wild onions, and many other plant species.
- Salmon and steelhead were caught all year round one mile upstream from the fish-bearing stream that joins the main Orford River. A further 7 miles up this stream all types of salmon were traditionally harvested. There is also a good hunting area on a grassy valley area up the Orford River near the pool at the base of a waterfall.
- In addition, the permanent village site, and associated heritage sites located throughout the Orford Bay area should be protected from any use which may potentially negatively impact upon, alter or detrimentally harm the cultural use of

these (at least 28) sites. This entire unit area is a Xwémalhkwu Heritage Protection Zone, especially north and south of Orford Bay, Alpha Bluff, Paradise River, Hovel Bay and all village sites, archeological or pictograph features, rock features related to Xwémalhkwu mythology and spiritual practices and burial sites.

- There is a point on the shore just south of the southern shore of Orford Bay which is a transformation site, where deer was changed into rock which can still be seen just above the high water line. This site is also the subject of a traditional Xwémalhkwu legend.
- As uses within this Unit Area may potentially conflict with Xwémalhkwu traditional fisheries of rockfish and restoration of these species, Xwémalhkwu First Nation recommends that no uses should be recommended which may potentially conflict with the Xwémalhkwu Rockfish Conservation Area of which the entire unit is designated, particularly the area south and north of Alpha Bluff or the Xwémalhkwu Krill Conservation Area.
- This entire unit area is an Xwémalhkwu Black and Grizzly Bear Conservation Area. Xwémalhkwu First Nation recommends that no hunting of black or grizzly bears should be permitted in the entire Bute Inlet as this conflicts with Homalco Wildlife Tours ecotourism as well as Xwémalhkwu First Nation priority interests. Due to Xwémalhkwu First Nation interests in conservation, enhancement and protection of the Bute Inlet and the resources located therein, Xwémalhkwu First Nation is interested in investigating options in conjunction with governments and/or tenure holders for the provision of on the ground integrated management of the ocean, foreshore, nearshore, and inland water and land areas through the establishment of a guardian service to monitor and implement protective measures for the restoration, enhancement and sustainable use of all resource values in the entire Bute Inlet, through, potentially, the imposition of levies or user fees for tenure holders, licence holders and users of the Bute Inlet.
- Resource and user potentially conflicts exist in this Unit Area. Specifically log handling tenures at Orford Bay potentially conflict with salmon migration routes for adults and smolts, estuary rearing, especially coho. These also potentially conflict with enhancement efforts Xwémalhkwu First Nation is undertaking with regard to the work being carried on at the hatchery at Orford Bay.
- Xwémalhkwu First Nation has an economic interest in the entire Orford Bay area for ecotourism development in the near future, including a lodge and extended bear viewing opportunities. In addition, Xwémalhkwu First Nation has an interest in providing fresh water fishing guiding along the Orford River. In fact, Xwémalhkwu First Nation has an economic interest in the tourism and sustainable development potential of this entire unit area, particularly around Orford Bay, Paradise River, Moh Creek and Bear River.
- Xwémalhkwu First Nation also has an economic interest in investigating the development of ocean ranching opportunities at Paradise River, Moh Creek and Bear River.
- Existing tenure holders or licencees should develop mitigation plans, in conjunction with Xwémalhkwu First Nation members regarding potential negative impacts any use may have or could possibly have on Xwémalhkwu heritage sites, cultural sites, fishery and hunting sites, and plant harvesting sites throughout this Unit Area, as this Unit Area is at the core of Xwémalhkwu traditional territory.
- For example, log handling tenures located at Orford Bay may have and may in the future, potentially conflict with Xwémalhkwu interests articulated above, and in particular, with Xwémalhkwu First Nation interests in the health of the salmon migration (adults and smolts) and estuary rearing, especially coho, further described in the Introduction section.
- The entire inlet is subject to strong, freezing outflow winds in winter. These 'Bute Winds' are a major hazard to public navigation, and the few areas of shelter from the winds may be a matter of life or death. Any tenure which (i.e. finfish or deepwater aquaculture) would have to be located in such sheltered areas, would conflict with public navigation as well as potentially negatively impact on Xwémalhkwu fishery interests, as well as the ability of Xwémalhkwu members to practice preferred means of harvesting all traditional fish, animal and plant species, and the continued practice of traditional activities carried on throughout the Inlet.
- As this area is in the heart of Xwémalhkwu First Nation traditional territory, including traditional fisheries for salmon, rockfish, lingcod and shellfish, Xwémalhkwu First Nation interests in conservation and restoration of these marine resources and the potential resource conflicts resulting from new or further tenures potentially conflicting with these



interests, Xwémalhkwu First Nation recommends that no new log handling, log sorting, commercial or industrial uses should be considered for this area.

- In addition, Xwémalhkwu First Nation recommends adding to management guidelines that existing log handling tenure holders within Orford Bay and on the shoreline opposite Havel Bay should provide mitigation plans developed in consultation with Xwémalhkwu First Nation to provide for potential negative impacts on attributes in the Unit Area which may result, especially with regard to salmon fishery spawning enhancement efforts and the important kelp beds located there.

## UNIT 18 UPPER BUTE

- Xwémalhkwu First Nation asserts that this Unit Area is within Xwémalhkwu First Nation traditional territory and extensive traditional uses and sites have been recorded.
- Under areas of ecological significance, estuaries and wetlands at mouths of Southgate and Bear Rivers should be added, in addition to that of Homathko. Further, the Homathko and Southgate Rivers are very significant salmon producers of chum, pink, chinook and coho.
- Biological attributes should include the fish streams at the head of the inlet: Cumsack, Homathko, Southgate, Teaquahan all support chum, pinks, coho, and chinook salmon. Eulachon spawning in the Homathko/Teaquahan estuary should also be listed under this section. In addition, the existing note on herring spawning should mention Bear Bay as an especially important spawning area.
- Ecounit profile, under exposure (fetch) should be changed to maximum.
- A natural corral up the mountain face located on the bay south of Boyd Point is a traditional hunting site with access from the foreshore.
- From Granite Peak parallel to the shore at Boyd Point is a traditional legend site and mountain goat hunting site with access from the foreshore.
- Bear River is a village site which is an Xwémalhkwu Indian Reserve, used during herring harvesting and processing times. The village site is located on the right side of the river mouth, going up river. Shell middens are also located there, which Xwémalhkwu First Nation recommends researching. The whole bay is a harvest site for spring salmon, red snapper, coho, herring roe and a hunting area. The first river south of Bear River is a village and hunting site for black bear, as is the next creek south of this river, used primarily while hunting up in the mountain with access from the shoreline. Approximately 3 km north of Bear Bay is a culturally important distinctive rock up about 100 feet from the beach on the south shore of a fair sized creek, which has a waterfall that empties into a big pool, access to which is from the shoreline.
- North of this rock and creek, in the first bay south of Hamilton Point, is another distinctive whale shaped rock.
- North of the whale-shaped rock, two miles west and slightly south from the west shore of Bute Inlet, and inland, but still south of Hamilton Point, is a bowl-shaped mountain basin which is a well known mountain goat hunting area, commencing at the nearshore, access to which is the shoreline.
- There is a Xwémalhkwu legend relating to salmon resource indicators connected to the cliffs south of Hamilton Point. These cliffs have distinctive markings that run right down to the water's edge, access to which is the shoreline. Hamilton Point, a traditional harvest site for herring and herring roe, also boasts a distinctive culturally important rock formation.
- There is a year-round spring of cold water in the big rocks at the base of a rockslide a short distance south of Potato Point important to Xwémalhkwu people as this spring never freezes and is accessible via the shoreline. South of this spring is a village site, which has also been a cannery location.
- Potato Point is an Xwémalhkwu burial ground and a traditional seal hunting site, as well as a harvest site for other fisheries using cedar bark nets, similar to modern gill nets. It is also a harvest site for wild onions all along the bay between the Homathco and Southgate Rivers, and is a resting spot for Canada geese.
- Up from the burial ground at Potato Point, on the left hand side, is Cumsack Creek where coho, chum, chinook, steelhead, and trout are harvested.
- The swampy part of Waddington Harbour is a traditional site for harvesting plant species and materials including wild onions, wild crab apples, cattails and hunting water fowl. Waddington Harbour is a harvesting site for eulachon. The rivers and creeks within this harbour are also known as good places to harvest trout and steelhead.

- Up the Teaquahan River, ocher paint, used for ceremonial purposes, is collected. In addition, eulachon harvest occurs here and at the Galleon Creek tributary. Traditional plant harvesting occurs along the rivers including materials for baskets, berries, and medicinal plants.
- A traditional mountain goat trail and hunting site is located north of the mouth of the Southgate River and immediately north of a frog shaped rock. The goats come down to the water in the summer to drink the water that is a mixture of salt and fresh, and to eat the brown algae and sea wrack.
- On the left side of the mouth of the Southgate River, on a flat area was a permanent Xwémalhkwu village, and smoking site. It is also a harvest site for numerous marine species and a stone fish trap (tidal weir) has traditionally been used to catch herring and salmon. Southgate River is also a traditional chinook, chum, coho and pink and herring fishery.
- A tiny island on the north side of the Southgate River, about a mile up the river at the mouth of the small creek that has a rock shaped like a whale is a food harvesting and hunting area.
- On the bay immediately northeast from Ward Point are rocks connected to Xwémalhkwu mythology relating to the coming of spring.
- There is a mountain goat hunting site on a distinctive point between Ward Bay and the next point. The goats come down to drink the water that is a mixture of water and salt.
- A small point south of Ward Point is a village site used while travelling, as it is a protected area for canoes. It is also a deer hunting area.
- Xwémalhkwu traditional fisheries include salmon, eulachon and herring, and in particular: tidal and river salmon weirs at Homathko River.
- The big rock at Purcell Point is a traditional navigational aid.
- The first big bay north of Hovel Bay, south of Purcell Point is a traditional harvesting site for plant products, including black cap berries with access from the shoreline. It is a traditional summer village site and a hunting and fishing location for trolling spring salmon.
- A large creek slightly more than half the distance between Purcell Point and Hovell Bay is a mountain goat hunting area and village site.
- Xwémalhkwu First Nation recommends that management emphasis be changed from general marine to conservation due to the high conservation and pristine values located in this Unit Area, including the Xwémalhkwu First Nation traditional fisheries for salmon, eulachon and herring, the fact that the entire Unit Area is a FOC Proposed Rockfish Conservation Area, the estuaries and wetlands at the head of the Southgate, Homathko and Bear Rivers, Waddington Harbour, the use of the areas for Grizzlies, among other attributes. This entire unit area has been designated as an Xwémalhkwu Rockfish Conservation Area, Xwémalhkwu Black and Grizzly Bear Conservation Area and as an Xwémalhkwu Krill Conservation Area.
- This entire unit area has been designated as a Xwémalhkwu Heritage Protection Zone, especially the areas around Southgate, Homathco, Potato Point, Bear Bay, Ward Point, Waddington Harbour and all village sites, archeological or pictograph features, rock features related to mythology and spiritual practices or otherwise culturally important.
- Xwémalhkwu First Nation has an interest in re-establishing the old grease trail to Chilcotin territory that commences by Homalco I.R. 2 and Homalco I.R. 2A, otherwise known as the Waddington Trail. Xwémalhkwu First Nation has economic interests in the entire Waddington Harbour; acquiring clam leases in particular, and in addition, a development interest, for tourism purposes, in both the Homathko and Southgate Rivers. As well, the Xwémalhkwu First Nation has an interest in providing the guiding for fresh water fisheries in these areas and providing salmon enhancement monitoring and fish count management of the river systems in the Waddington Harbour, including the operation of an Xwémalhkwu First Nation fish wheel.
- This entire unit area is an Xwémalhkwu Salmon Enhancement and Conservation Area, particularly around Homathco, Southgate, Bear Bay, Cumsack Creek and Waddington Harbour.
- Existing tenured uses may potentially conflict with Xwémalhkwu traditional use and restoration concerns. These include the light industrial tenure at Waddington Harbour, which may potentially conflict with eulachon, salmon and herring habitat and fisheries. The log handling tenures at Bear Bay may potentially conflict with the traditional herring fishery and with herring spawning, as this area is the most consistently used herring spawning ground in the Bute Inlet.
- The log handling tenure at Waddington Harbour may potentially conflict with the fisheries values related to salmon and eulachon, including salmon

smolt migration and early rearing, and known clam beaches. Therefore Xwémalhkwu First Nation recommends that existing tenure holders develop mitigation plans and restoration plans in conjunction with Xwémalhkwu First Nation to address these possible and potential detrimental impacts on traditional fisheries interests and the restoration and enhancement of these interests, including potential negative impacts to salmon, eulachon, clams, estuary ecosystem and herring spawning.

- The entire inlet is subject to strong, freezing outflow winds in winter. These 'Bute Winds' are a major hazard to public navigation, and the few areas of shelter from the winds may be a matter of life or death. Any tenure which (i.e. finfish or deepwater aquaculture) would have to be located in such sheltered areas, would conflict with public navigation as well as potentially negatively impact on Xwémalhkwu fishery interests, as well as the ability of Xwémalhkwu members to practice preferred means of harvesting all traditional fish, animal and plant species, and the continued practice of traditional activities carried on throughout the Inlet.
- Xwémalhkwu First Nation recommends that any finfish aquaculture or deepwater shellfish culture, proposed to be located in protected, exposed and high current areas in this Unit Area may potentially conflict with, and therefore must be considered in light of Xwémalhkwu First Nation interests in protecting safe anchorages for Xwémalhkwu First Nation members to continue to have the ability to practice their aboriginal rights, necessarily entailing the continued access of safe anchorages within the traditional territory for members. Further, Xwémalhkwu First Nation recommends that prior to considering these uses acceptable in this Unit Area, proponents should be obliged to provide confirmation that such tenures will not alter beach structures or alter or add sediment to fish bearing streams.
- Further detail should be included on salmon streams, such as: this Unit Area has regionally significant salmon production capability, especially chum and pink, but also coho, chinook and sockeye. Six streams supported chum including Apple River, Heydon Creek, Grassy Creek, and Stafford River. Six significant pink salmon spawning streams exist in this Unit Area, including Grassy Creek, Heydon Creek, and Frazer Creek. Six streams have supported coho stocks including Apple River, Heydon Creek, and Stafford River. Four creeks have supported Chinook stocks, including Apple River and Stafford River. Heydon Creek has historically supported sockeye and Heydon Bay is a traditional fishing site. Fishing and the harvest of oysters and clams occurs throughout this unit. At the head of Beaver Inlet, whose entrance is on the west side of the Loughborough Inlet, is a place translated as "having mussels".
- Xwémalhkwu First Nation has an interest in restoring and enhancing the productive capability of these streams and rivers to guarantee the continued exercise of Xwémalhkwu traditional fishery harvesting. This entire unit has been designated as an Xwémalhkwu Salmon Enhancement and Protection Area, as well as an Xwémalhkwu Rockfish Conservation Area.
- Any uses that potentially conflict with these interests cannot be recommended. In particular, Xwémalhkwu First Nation recommends that creeks, such as Grassy Creek, should be studied as to the potential negative impacts which have detrimentally harmed the pink salmon runs in this creek, so as to create mitigation plans and restoration programmes for these rivers and creeks in conjunction with any present and future tenure holders.
- Log handling tenures at Heydon Bay may potentially conflict with Xwémalhkwu traditional salmon fishery, especially the use of the estuary for rearing and by outmigrant smolts. Other specific sites should be examined with respect to potentially conflicting uses on salmon adult and juveniles, clams, other bottom species, rockfish habitat where tenures are over rocky bottom. This latter point is especially so for areas within the Rockfish Conservation Area which is the whole inlet above Mitchell Point. Xwémalhkwu First Nation therefore recommends that conservation of rockfish be a priority when considering acceptable

## UNIT 19 LOUGHBOROUGH INLET

- Xwémalhkwu First Nation asserts this area is within its traditional territory.
- Ecounit profile, under exposure (fetch) should be changed to maximum.
- Biological attributes should include George Creek as an anadromous fish stream, as it enters the east side of the inlet near the settlement of George River.

uses. Mitigation measures carried out in consultation with Xwémalhkwa First Nation should be required if activation or continuation of this use is permitted.

- Finfish aquaculture capability rating for this Unit Area does not mention any possible conflict with salmon smolt migration, especially potential for sea lice transmission to chum and pink smolts. This should be considered, as present scientific data confirms that there may be a potential conflict.
- Xwémalhkwa First Nation recommends that any finfish aquaculture or deepwater shellfish culture, proposed to be located in protected, exposed and high current areas in this Unit Area may potentially conflict with, and therefore must be considered in light of Xwémalhkwa First Nation interests in protecting safe anchorages for Xwémalhkwa First Nation members to continue to have the ability to practice their aboriginal rights, necessarily entailing the continued access of safe anchorages within the traditional territory for members. Further, Xwémalhkwa First Nation recommends that prior to considering these uses acceptable in this Unit Area, proponents should be obliged to provide confirmation that such tenures will not alter beach structures or alter or add sediment to fish bearing streams.

the continued access of safe anchorages within the traditional territory for members. Further, Xwémalhkwa First Nation recommends that prior to considering these uses acceptable in this Unit Area, proponents should be obliged to provide confirmation that such tenures will not alter beach structures or alter or add sediment to fish bearing streams.

## UNIT 20 MAYNE PASSAGE

- Xwémalhkwa First Nation asserts that this Unit Area is within Xwémalhkwa First Nation traditional territory.
- Ecounit profile, under exposure (fetch) should be changed to maximum.
- Possible conflicts between finfish aquaculture and migrant wild salmon smolts, especially pink and chum coming from spawning areas in Phillips Arm, Frederick Arm and Bute Inlet.
- Possible conflicts exist between shellfish bottom culture tenures and wild shellfish harvesting in this Unit Area.
- Xwémalhkwa First Nation recommends that any finfish aquaculture or deepwater shellfish culture, proposed to be located in protected, exposed and high current areas in this Unit Area may potentially conflict with, and therefore must be considered in light of Xwémalhkwa First Nation interests in protecting safe anchorages for Xwémalhkwa First Nation members to continue to have the ability to practice their aboriginal rights, necessarily entailing



## Appendix 4: Data Sources

For additional details on the data sets used and contact information for data managers, please refer to the Guide to Land and Resource Information for British Columbia available on the internet at [ftp://ftp.gis.luco.gov.bc.ca/pub/landuse/rpts/Guide\\_to\\_Land\\_and\\_Resources.pdf](ftp://ftp.gis.luco.gov.bc.ca/pub/landuse/rpts/Guide_to_Land_and_Resources.pdf)

**Table 28 Data Sources Used in Johnstone - Bute Coastal Plan**

Data	Source	Date	Scale	Notes
Anadromous Salmonid Stream	Fish Inventory Summary System	2002	1:50,000	Joint project with MSRM and DFO
Bathymetry	Canadian Hydrographic Service	Various	Various	
Boat Havens	Council of BC Yacht Clubs	2001	1:250,000	
Clam Atlas	DFO*	1995	Various	
Commercial Invertebrate Fisheries	DFO*	1996	Various	
Commercial Vertebrate Fisheries	DFO*	1996	Various	
Eagle nests	Nestucca Eagle Study Vancouver Island.	1999	1:50,000	
Eelgrass	DFO*	1992	1:40,000	From CHS charts 3543 & 3539
Estuaries	Base Thematic Mapping	2003	1:250,000	
Estuaries	Physical Shorezone Mapping System	2000	1:40,000	
Existing Protected Areas	BC Parks	2003	Various	
First Nations Reserves	Ministry of Sustainable Resource Management	2002	1:20,000	
Goal 1 and Goal 2 study	Ministry of Forests	2003	1:20,000	
Herring Spawning Segment	DFO*	1996	Various	
Kelp	Kelp Inventory Studies	Various	1:40,000	
Marine Ecounits	Provincial Oil Spill Response and Information System (OSRIS)	2001	1:40,000	
Marine Mammals Migration Routes	DFO*	2004	Various (about 1:50,000)	
Marine Navigation	DFO*	2004	Various (about 1:50,000)	
Physical Shore Type	Physical Shorezone Mapping System	2000	1:40,000	Sport fishing points augmented with local knowledge
Recreational Invertebrate Fisheries	DFO*	1996	Various	
Recreational Vertebrate Fisheries	DFO*	1996	Various	Some ratings have been modified from the original based on more recent information from salmon farming companies.
Red/Blue Species	Conservation Data Center	Current	Various	
Salmon Aquaculture Opportunity	Salmon Biophysical Suitability Study of the Sunshine Coast & Johnstone Strait/Desolation Sound.	1989	1:50,000	

\*DFO: Department of Fisheries and Oceans

Data	Source	Date	Scale	Notes
Salmon Migration Routes & Holding Areas	DFO*	2004	Various (about 1:50,000)	
Seal & Sea Lion Haulouts	DFO*	1994-1997	1:40,000	
Shellfish Capability	Shellfish Culture Capability Appraisal for Johnstone Strait.	1997	1:50,000	
Tenure & Industry	Land & Water BC Inc.	Current	1:20,000	
Tourism/Recreation Features	Tourism Opportunity Study: Campbell River/Port McNeill	2000	1:250,000	Sport fishing, heritage, campsite and SCUBA diving sites augmented with local knowledge
Tourism/Recreation Features	Tourism Opportunity Study: Sunshine Coast	2001	1:250,000	Sport fishing, heritage, campsite and SCUBA diving sites augmented with local knowledge

\*DFO: Department of Fisheries and Oceans

## Appendix 5: Decision Tools

### DECISION RULES FOR DETERMINATION OF ACCEPTABLE USES AND ACTIVITIES

#### *General Considerations*

A use is initially identified as acceptable if the use already exists and is tenured in a unit.

An existing use initially identified as acceptable is changed to conditionally recommended if information and input determines there is an expectation of significant user or resource conflicts; or if the unit is unable to support additional uses due to a lack of capable areas that meet established siting criteria.

A use is also identified as conditionally acceptable if it does not exist in the unit, but would be considered potentially compatible with existing values and resources, depending on the submission of more specific information with a tenure application. Such information could include: biophysical capability, results of a required review process, completion of a campsite strategy, or development of operating guidelines. Specific siting conditions or limitations would also result in the identification of a use as conditionally acceptable.

A use is initially identified as not acceptable if the use is currently not present in the unit and the biophysical capability assessment of the area shows no or poor capability for the use; if information and input determines there is an expectation of significant user or resource conflicts, or if the use is considered incompatible with adjacent upland designations.

An activity (i.e. not tenured or managed by the provincial government) is identified as present or absent from a unit, based on information known about the activity.

#### *Use-Specific Considerations:*

Shellfish beach aquaculture (beach or deep water aquaculture) is identified as acceptable if provincial government shellfish capability studies show high to moderate capability and such development does not alienate known shellfish beaches with established First Nations, recreational or commercial harvesting. It is also acceptable where LWBC has reserved sites for future First Nations development.

Shellfish deep water aquaculture is identified as acceptable if provincial government shellfish capability studies show high to moderate capability exists in a unit.

Marine plant aquaculture is initially identified as acceptable if provincial government capability mapping for deep water scallop aquaculture shows high to moderate capability exists in a unit.

Finfish aquaculture is identified as acceptable where provincial government opportunity studies show high to moderate capability. Where the unit exhibits compatibility or capacity concerns, the use may be changed.

Log Handling, Storage and Infrastructure is identified as acceptable if industry has identified future timber harvesting plans for adjacent upland, and siting criteria can be addressed.

Commercial and Industrial Docks are identified as acceptable in those units where it already occurs.

Private Docks are identified as acceptable if it exists in a unit or if the unit contains private land on the upland.

Float Homes are identified as acceptable if the unit currently contains tenured floating structures or floating communities.

Marine Telecommunications & Utilities use is identified as acceptable if there is an adjacent community on the upland, if there is an expectation of development (such as utilities supporting sanitary facilities at a campsite) or if the unit is considered suitable for a potential wind or wave energy generation facility.

Public Docks are identified as acceptable if there is an adjacent community on the upland, or if the need for public access is anticipated.

Commercial Recreation Guiding is generally identified as acceptable. Where guiding activities have the potential to impact sensitive migratory bird values this use is changed to conditionally acceptable subject to adherence to appropriate guidelines.

Floating Lodges and Base Camps are generally acceptable, with the exceptions that it is not acceptable in units where it may detract from existing recreational values or from community infrastructure. The use is not acceptable in units with existing road-accessible tourism infrastructure.

Conservation use is acceptable as a potential use in all units as well as in units where *Land Act* reserves or notations of interest already occur.

**Modifications:**

All of the above general and specific initial determinations may be modified as a result of social preferences, including comments and concerns from local government, the public and First Nations.

**Technical Siting and Compatibility Criteria for Tenured Uses**

The following references are intended to clarify how management direction may vary depending on specific circumstances. Where no source is cited, management direction is considered to apply in all situations.

**Note:** These criteria are included for background information only and reflect criteria in place at the time the Johnstone-Bute Plan was developed. DFO and MSRM are currently engaged in developing a suite of siting criteria based on sound science and reflecting DFO's Risk Management Framework approach which are expected to supersede this guidance in the near future.

**Table 29 Key**

<b>A:</b>	Acceptable
<b>M:</b>	Specific Management Provisions required to address interaction. Refer to management direction in specific Planning Units
<b>S:</b>	Siting Criteria established to address interaction
<b>T:</b>	Timing window established to address activities/uses during critical periods
<b>R:</b>	Criteria identified to trigger provincial interagency referral
<b>NC:</b>	Not Compatible – no overlap permitted

**Table 30 Sources**

MOU:	November 2001 MOU between BCAL (LWBC) and Provincial Referral Agencies
SMP:	Provincial Shellfish Management Plan MAFF/LWBC
FMP:	LWBC Commercial Finfish Aquaculture Management Plan Schedule C
DFO BMP:	Environmentally Sustainable Log Handling Facilities in BC Section 6 Siting and Design

**Table 31****Use/Resource Compatibility and Referral Requirements: Shellfish Beach Aquaculture**

Water Depth	
Salmon Stream (mouth)	S- Shellfish culture is not to be conducted within the braided channels of any salmonid creek. (SMP) T - Activities are to be timed to minimize impacts on plants and animals (e.g. avoiding main spawning windows) (SMP)
Clam/ Oyster Beach	R - No overlap, referral to WLAP required if application is within 100m (MOU)
Eelgrass Beds	NC: No overlap - 5m minimum (SMP) R: referral to WLAP required if application is within 100m. (MOU) S: Installation of any structures must not alter or disrupt eelgrass habitats (MOU,SMP)
Kelp Beds	NC - No gear and/or floating structures to be established over kelp bed habitats (SMP)
Rocky Reefs	NC - No gear and/or floating structures to be established over rocky reef habitats (SMP)
Estuaries/ Lagoons	R: Referral to WLAP required if application is within 100m(MOU)
Salt Marshes and Mudflats	R: Where identified as a sensitive ecosystem, a provincial tenure is required for applications within 30m (MOU) M - Installation of any structures must not alter or disrupt salt marsh habitats (SMP)
Seal/ Sea lion Haulout	R: Referral to WLAP required if application is within 500m (MOU)
Whale Feeding Areas or Migration Pathways	R: Referral to WLAP required if application is within 500m (MOU)



Eulachon Migration and Rearing	T - Activities are to be timed to minimize impacts on plants and animals (e.g. avoiding main spawning windows) (SMP)
Herring Spawning and Migration	T - Activities are to be timed to minimize impacts on plants and animals (e.g. avoiding main spawning windows) (SMP)
Waterfowl habitat	M - Uncultivated or harvested "leave strips" should be incorporated within the design of beach culture tenures to minimize overall impact on shore birds. Leave strips to cover at least 30% of the tenure area at any given time. (MOU BMP) T - Where possible, aquaculture activity should take place during periods of low bird use (Both seasonal and diurnal) (MOU BMP)
Seabird Colonies	R: Referral to WLAP required if application is within 500m - Includes rafting and congregating areas as well as colonies (MOU)
Wildlife Trees/ Heronries	R: Referral to WLAP required if application is within 100m (MOU)
Invertebrate Habitat	R: Where identified as a sensitive ecosystem, a provincial tenure is required for applications within 30m (MOU)
Red/ Blue Species	M - species specific considerations
Parks, Ecological Reserves, Marine Protected Areas	NC
Areas of significant heritage or cultural value	To be addressed through referrals to MSRM: Archaeology and Registry Services Branch and affected First Nations

**Table 32 Use/Resource Compatibility and Referral Requirements: Shellfish Beach Aquaculture Deep Water**

Water Depth	
Salmon Stream (mouth)	S - Shellfish culture is not to be conducted within the braided channels of any salmonid creek. (SMP) T - Activities are to be timed to minimize impacts on plants and animals (e.g. avoiding main spawning windows) (SMP)
Clam/ Oyster Beach	R - No overlap. Referral to WLAP required if application is within 100m (MOU)
eelgrass Beds	NC - No overlap ñ 5m minimum buffer (SMP) R: Referral to WLAP required if application is within 100m. (MOU) S: Installation of any structures must not alter or disrupt eelgrass habitats (MOU, SMP)
Kelp Beds	NC - No gear and/or floating structures to be established over kelp bed habitats (SMP)
Rocky Reefs	NC - No gear and/or floating structures to be established over rocky reef habitats (SMP)
Estuaries/ Lagoons	R: Referral to WLAP required if application is within 100m (MOU)
Salt Marshes and Mudflats	R: Where identified as a sensitive ecosystem, a provincial tenure is required for applications within 30m (MOU) M - Installation of any structures must not alter or disrupt salt marsh habitats (SMP)
Seal/ Sea lion Haulout	R: Referral to WLAP required if application is within 500m (MOU)
Whale Feeding Areas or Migration Pathways	R: Referral to WLAP required if application is within 500m (MOU)
Eulachon Migration and Rearing	T - Activities are to be timed to minimize impacts on plants and animals (e.g. avoiding main spawning windows) (SMP)
Herring Spawning and Migration	T Activities are to be timed to minimize impacts on plants and animals (e.g. avoiding main spawning windows) (SMP) M Herring spawn on long lines be left until eggs hatch and larvae emerge (SMP) M - Logline netting (where used) should extend a minimum of 20m below the

Waterfowl habitat	surface of the water to minimize conflict with diving ducks. (MOU BMP) T - Where possible, aquaculture activity should take place during periods of low bird use (Both seasonal and diurnal) (MOU BMP) R: Referral to WLAP required if application is within 500m Includes rafting and
Seabird Colonies	congregating areas as well as colonies (MOU) R: Referral to WLAP required if application is within 100m (MOU)
Wildlife Trees/ Heronries	R: Where identified as a sensitive ecosystem, a provincial tenure is required for
Invertebrate Habitat	applications within 30m (MOU) M: species specific considerations
Red/ Blue Species	NC
Parks, Ecological Reserves, Marine Protected Areas	R: Address through referrals to MSRM: Archaeology and Registry Services
Areas of significant heritage or cultural value	Branch and affected First Nations

**Table 33****Use/Resource Compatibility and Referral Requirements: Finfish Aquaculture**

Water Depth	
Salmon Stream (mouth)	S: 1km from mouth of salmonid-bearing stream as determined to be significant by DFO and the Province (FMP)
Clam/ Oyster Beach	S: 125m /300m A minimum spacing of 125 m is required from all shellfish beds and commercial shellfish growing operations. (FMP) At least 300m must separate finfish aquaculture sites and inter-tidal shellfish beds that have regular or traditional use for First Nations, recreational or commercial fisheries where beds are exposed to water flow from a salmon farm. (FMP)
Eelgrass Beds	M - Where identified as sensitive (as defined by DFO and the province), fish habitat an appropriate siting distance will be determined by DFO and the Province. (FMP)
Kelp Beds	M - Where identified as sensitive (as defined by DFO and the province), fish habitat, an appropriate siting distance will be determined by DFO and the Province. (FMP)
Rocky Reefs	M - Where identified as sensitive(as defined by DFO and the province), fish habitat, an appropriate distance will be determined (FMP)
Estuaries/ Lagoons	M - Where identified as sensitive (as defined by DFO and the province), fish habitat, an appropriate distance will be determined by DFO and the Province (FMP)
Salt Marshes and Mudflats	M - Where identified as sensitive (as defined by DFO and the province), fish habitat, an appropriate distance will be determined by DFO and the Province (FMP)
Seal/ Sea lion Haulout	M - Appropriate distance from areas extensively used by marine mammals to be determined by DFO and the Province.(FMP)
Whale Feeding Areas or Migration Pathways	M - Appropriate distance from areas extensively used by marine mammals to be determined by DFO and the Province.(FMP)
Eulachon Migration and Rearing	M
Herring Spawning and Migration	1km - Where herring spawning areas are designated as vital, major or important by DFO and the Province. (FMP)
Waterfowl habitat	-
Seabird Colonies	-
Wildlife Trees/ Heronries	-
Invertebrate Habitat	S - Where invertebrate habitat includes surveyed commercial dive fishery areas, siting should ensure that surveyed areas are not alienated from harvesting (FMP)
Red/ Blue Species	M - species specific considerations

Parks, Ecological Reserves, Marine Protected Areas	1km - Siting not within line of sight up to 1km in all directions from existing or approved proposals for federal, provincial or regional parks and MPAs, existing or approved proposals for ecological reserves <1000ha (FMP)
Areas of significant heritage or cultural value	R: Address through referrals to MSRM: Archaeology and Registry Services Branch and affected First Nations

**Table 34 Use/Resource Compatibility and Referral Requirements: Log handling Storage and Infrastructure**

Water Depth	S: Log handling and booming grounds require water depth at least 12m. (DFO MOU) S: Heli-log drop areas require water depth at least 20m and are not allowed to strike bottom when released. (DFO BMP) S: Log dumps must be located so that logs can be watered at any tide without grounding (MOU).
Salmon Stream (mouth)	S: 100m for log dumps, helicopter log dumps and booming areas (DFO BMP)
Clam/ Oyster Beach	NC
eelgrass Beds	NC
Kelp Beds	NC
Rocky Reefs	
Estuaries/ Lagoons	NC
Salt Marshes and Mudflats	NC
Seal/ Sea lion Haulout	NC
Whale Feeding Areas or Migration Pathways	T: between May 15 and September 1 monitor whale behaviour, temporarily stop activity if whales approach within 300m of helicopter flight path or demonstrate markedly different behaviour
Eulachon Migration and Rearing	M: To be determined on a site by site basis (DFO BMP)
Herring Spawning and Migration	T: refer to DFO for timing windows associated with herring spawn activities
Waterfowl habitat	-
Seabird Colonies	
Wildlife Trees/ Heronries	100m/ 300m (DFO BMP)
Invertebrate Habitat	
Red/ Blue Species	M: species specific considerations
Parks, Ecological Reserves, Marine Protected Areas	NC
Areas of significant heritage or cultural value	R: Address through referrals to MSRM: Archaeology and Registry Services Branch and affected First Nations
Barge Sites	At least 150m from shore with water depth of 9m and should never ground on a low low tide

**Table 35 Use/Resource Compatibility and Referral Requirements: Private Docks**

Water Depth	M - Boats, floats and other floating structures should be located and firmly moored in deep water, far enough offshore to prevent grounding at low tide (MOU BMP)
Salmon Stream (mouth)	S: In the absence of a response from DFO, WLAP recommends a minimum separation of 100m from spawning areas
Clam/ Oyster Beach	S: In the absence of a response from DFO, WLAP recommends a minimum separation of 125m
eelgrass Beds	NC - Not compatible except where approved by DFO
Kelp Beds	NC - Not compatible except where approved by DFO
Rocky Reefs	-
Estuaries/ Lagoons	S: In the absence of a response from DFO, WLAP recommends a minimum separation of 100m

Salt Marshes and Mudflats	S: In the absence of a response from DFO, WLAP recommends a minimum separation of 30m
Seal/ Sea lion Haulout	S: In the absence of a response from DFO, WLAP recommends a minimum separation of 250m
Whale Feeding Areas or Migration Pathways	-
Eulachon Migration and Rearing	-
Herring Spawning and Migration	-
Waterfowl habitat	-
Seabird Colonies	S: In the absence of a response from DFO, WLAP recommends a minimum separation of 500m a from seabird colony, 100m from seabird congregating areas
Wildlife Trees/ Heronries	-
Invertebrate Habitat	-
Red/ Blue Species	-
Parks, Ecological Reserves, Marine Protected Areas	NC
Areas of significant heritage or cultural value	R: Address through referrals to MSRM: Archaeology and Registry Services Branch and affected First Nations

**Table 36****Use/Resource Compatibility and Referral Requirements: Communication Sites**

Water Depth	-
Salmon Stream (mouth)	30m
Clam/ Oyster Beach	-
Eelgrass Beds	-
Kelp Beds	-
Rocky Reefs	-
Estuaries/ Lagoons	30m
Salt Marshes and Mudflats	-
Seal/ Sea lion Haulout	200m
Whale Feeding Areas or Migration Pathways	
Eulachon Migration and Rearing	
Herring Spawning and Migration	
Waterfowl habitat	
Seabird Colonies	NC - no overlap with seabird colonies accepted except in critical situations where no other option exists. Referral required (MOU)
Wildlife Trees/ Heronries	100m
Invertebrate Habitat	
Red/ Blue Species	
Parks, Ecological Reserves, Marine Protected Areas	
Areas of significant heritage or cultural value	



**Table 37****Use/Resource Compatibility and Referral Requirements: Private/Public Utilities**

Water Depth	
Salmon Stream (mouth)	30m - Distance specified for salmonid spawning areas
Clam/ Oyster Beach	60m
Eelgrass Beds	30m
Kelp Beds	
Rocky Reefs	
Estuaries/ Lagoons	60m
Salt Marshes and Mudflats	NC
Seal/ Sea lion Haulout	100m
Whale Feeding Areas or Migration Pathways	
Eulachon Migration and Rearing	
Herring Spawning and Migration	
Waterfowl habitat	
Seabird Colonies	300m - Alternately installation to occur outside of nesting/rearing period.
Wildlife Trees/ Heronries	100m
Invertebrate Habitat	
Red/ Blue Species	
Parks, Ecological Reserves, Marine Protected Areas	
Areas of significant heritage or cultural value	

**Table 38****Use/Resource Compatibility and Referral Requirements: Floating Lodges and Base Camps**

Water Depth	
Salmon Stream (mouth)	30m 60m 300m - 30 m buffer for streams except stream approaches and crossings; 60m buffer specified for salmonid spawning areas. 300m specified for grizzly and/or black bear fishing sites. (MOU) 15m30m - Spacing specified for sanitary and domestic waste facilities. 15m separation is the minimum acceptable buffer for self-contained or composting facilities, 30m for all others.
Clam/ Oyster Beach	60m 150m - 150m distance required for docks and outfalls (MOU) 15m30m - Spacing specified for sanitary and domestic waste facilities. 15m separation is the minimum acceptable buffer for self-contained or composting facilities, 30m for all others.
Eelgrass Beds	NC
Kelp Beds	30m - Where identified as a sensitive ecosystem (MOU)
Rocky Reefs	30m - Where identified as a sensitive ecosystem (MOU)
Estuaries/ Lagoons	30m - Raised walkways may be acceptable (MOU)
Salt Marshes and Mudflats	30m
Seal/ Sea lion Haulout	
Whale Feeding Areas or Migration Pathways	
Eulachon Migration and Rearing	
Herring Spawning and Migration	
Waterfowl habitat	
Seabird Colonies	200m

Table 39 Use/Resource Compatibility and Referral Requirements: Floating Lodges and Base Camps (cont...)

Wildlife Trees/ Heronries	100m/ 200m - 200m for heronries (MOU)
Invertebrate Habitat	
Red/ Blue Species	
Parks, Ecological Reserves, Marine Protected Areas	
Areas of significant heritage or cultural value	

**Table 39****Use/Resource Compatibility and Referral Requirements: Floating Lodges and Base Camps**

Water Depth	
Salmon Stream (mouth)	15m 30m - Spacing specified for sanitary and domestic waste facilities. 15m separation is the minimum acceptable buffer for self-contained or composting facilities, 30m for all others.
Clam/ Oyster Beach	15m30m - Spacing specified for sanitary and domestic waste facilities. 15m separation is the minimum acceptable buffer for self-contained or composting facilities, 30m for all others.
Eelgrass Beds	
Kelp Beds	
Rocky Reefs	
Estuaries/ Lagoons	NC - Kayak landing sites should be located away from estuaries and lagoons. Landing sites should be located and used in a way to minimize physical and biological impacts to the foreshore (MOU BMP)
Salt Marshes and Mudflats	NC - Kayak landing sites should be located away from salt marshes. Landing sites should be located and used in a way to minimize physical and biological impacts to the foreshore (MOU BMP)
Seal/ Sea lion Haulout	
Whale Feeding Areas or Migration Pathways	
Eulachon Migration and Rearing	
Herring Spawning and Migration	
Waterfowl habitat	
Seabird Colonies	
Wildlife Trees/ Heronries	
Invertebrate Habitat	
Red/ Blue Species	
Parks, Ecological Reserves, Marine Protected Areas	
Areas of significant heritage or cultural value	

## Appendix 6: DFO Site Specific Assessment Considerations

The federal *Fisheries Act* prohibits any activity that results in the harmful alteration, disruption or destruction of fish habitat. As the preservation of fish habitat sometimes competes with other important economic activities, such as natural resource development, the destruction of fish habitat sometimes occurs. In cases where the damage to fish habitat cannot be avoided, the proponent is required to obtain an authorization that is provided for under the federal *Fisheries Act* for the harmful alteration, disruption or destruction of fish habitat.

Prior to the issuance of an authorization for the harmful alteration, disruption or destruction of fish habitat, the DFO Habitat Manager is guided by Canada's Policy for the Management of Fish Habitat as well as several related guidelines. Canada's Policy for the Management of Fish Habitat's overall objective is to achieve a net gain of habitat for Canada's Fisheries Resource. This is to be achieved through the conservation of existing habitat following the guiding principle of no net loss of productive capacity of habitats, through habitat restoration and the development of fish habitat.

When a project is reviewed and if it appears that the current habitat productive capacity cannot be maintained, a series of management options may be considered for habitat conservation and protection. These options are described in the *Habitat Conservation and Protection Guidelines 1998* which provide for three options in order of priority. These options are:

**Project Relocation** – DFO prefers to maintain natural habitat as much as possible and to avoid negative impacts.

**Project Redesign** – If relocation is impossible, the next option is to redesign the project.

**Mitigation** – Project relocation and/or redesign are not always feasible and, when feasible, they may not be sufficient to completely eliminate impacts on fish habitat productivity. In these situations mitigative measures have to be implemented during project planning, design, construction and/or operation. It is the responsibility of proponents to prepare mitigation plans. Commonly used mitigation measures include but is not limited to:

- utilizing appropriate timing windows for work in estuaries, the marine environment and streams.
- utilizing the least harmful equipment/materials/construction methods.

- protection of fish during the works.
- implementing measures to control sediment at construction sites.

Habitat Compensation – this is an option when impacts of projects on habitat are still considered harmful after relocation, redesign or mitigation options have been implemented. Compensation is not considered an option for loss of critical habitats and should only be considered where compensation for loss of critical habitat is achievable.

### LIST OF GUIDELINES/REFERENCES

Additional information can be found in the following:

#### *Policy for the Management of Fish Habitat*

[http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/legislation-lois/policies/fhm-policy/index\\_e.asp](http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/legislation-lois/policies/fhm-policy/index_e.asp)

#### *Decision Framework for the Determination and Authorization of Harmful Alteration, Disruption or Destruction of Fish Habitat*

[http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/guidelinesconseils/guides/hadd/index\\_e.asp](http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/guidelinesconseils/guides/hadd/index_e.asp)

#### *Guidelines for Attaining No Net Loss*

[http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/guidelinesconseils/guides/fhmcons/index\\_e.asp](http://www.dfo-mpo.gc.ca/canwaters-eauxcan/infocentre/guidelinesconseils/guides/fhmcons/index_e.asp)

#### *Habitat Conservation and Protection Guidelines*

[http://www.dfo-mpo.gc.ca/canwaters\\_eauxcan/infocentre/guidelinesconseils/guides/fhmguide/index\\_e.asp](http://www.dfo-mpo.gc.ca/canwaters_eauxcan/infocentre/guidelinesconseils/guides/fhmguide/index_e.asp)

#### *Marine Guide to Preventing Shoreline Erosion*

[http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/erosion\\_e.pdf](http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/erosion_e.pdf)

#### *Marine Guide to Small Boat Launches*

[http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/launches\\_e.pdf](http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/launches_e.pdf)

#### *Marine Guide to Small Boat Moorage*

[http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/moorage\\_e.pdf](http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/moorage_e.pdf)

#### *Marina Development*

Environmentally Sustainable Log Handling Facilities in British Columbia

[http://www.stewardshipcentre.bc.ca/sc\\_bc/stew\\_series/Pdf/LHFBMPs.pdf](http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/Pdf/LHFBMPs.pdf)

**Table 40 Best Management Practices**
**Water Quality Guidelines**

Use Category	Focus	Guideline	Source	Website
Agriculture	Non-Point Source Pollution	Agriculture: an Important Non-point Source of Pollution	FRAP	<a href="http://www.rem.sfu.ca/FRAP/S_47.pdf">http://www.rem.sfu.ca/FRAP/S_47.pdf</a>
Agriculture/ Industrial	Dairy Operations	Technical Pollution Prevention Guide for Dairy Processing Operations in the Lower Fraser Basin. 1996.	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9611.pdf">http://www.rem.sfu.ca/FRAP/9611.pdf</a>
Agriculture	Golf Course	Greening your BC Golf Course. A Guide to Environmental Management. 1996.	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9626.pdf">http://www.rem.sfu.ca/FRAP/9626.pdf</a>
Forestry	Forestry Herbicide Application	Guidelines for the Protection of Fish and Fish Habitat During Use of Glyphosphate and Other Selected Forestry Herbicides in Coastal British Columbia. 1992.	DFO-WQ	Contact DFO Regional Library 604-666-6371
Industrial	Marina/ Boatyard	Best Management Practices for Marinas and Small Boatyards in British Columbia. 1995.	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9516.pdf">http://www.rem.sfu.ca/FRAP/9516.pdf</a>
Industrial	Ship/ Boat Building & Repair	Best Management Practices for Ship and Boat Building and Repair Industry in British Columbia. 1995.	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9514.pdf">http://www.rem.sfu.ca/FRAP/9514.pdf</a>
Industrial	Ship/ Boat Building & Repair	Best Management Practices for Ship and Boat Building and Repair Industry in British Columbia. Background Document 1995.	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9515.pdf">http://www.rem.sfu.ca/FRAP/9515.pdf</a>
Marine Stewardship	Boating Guide	Protecting the Aquatic Environment. A Boater's Guide. 1997.	CCG	<a href="http://www.pacific.ccg-gcc.gc.ca/obs/pae/ENGLISH.PDF">http://www.pacific.ccg-gcc.gc.ca/obs/pae/ENGLISH.PDF</a>
Industrial	Fish Processing Plants	Guide for Best Management Practices for Process Water Management for Fish Processing Plants in British Columbia. 1994.	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9420.pdf">http://www.rem.sfu.ca/FRAP/9420.pdf</a>
Industrial	Fish Processing Plants	Technical Guide for the Development of Pollution Prevention Plans for Fish Processing Operations in the Lower Fraser Basin. 1995.	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9523.pdf">http://www.rem.sfu.ca/FRAP/9523.pdf</a>
Industrial	Commercial Car & Truck Washing	Chemical Use and Pollution Prevention Practices for Commercial Car and Truck Wash Facilities. 1995.	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9506.pdf">http://www.rem.sfu.ca/FRAP/9506.pdf</a>
Industrial	Cement Truck Wash Water	Operation Procedure to Recycle Truck Wash Water from Cement Delivery Trucks. 1999.	FRAP	Not Available
Industrial	Automobile Recycling	Environmental Protection for the Automobile Recycling Industry in British Columbia. 1996.	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9602.pdf">http://www.rem.sfu.ca/FRAP/9602.pdf</a>
Industrial	Automotive Recycling	Technical Pollution Prevention Guide for the Automotive Recycling Industry in BC	FRAP	Not Available
Industrial	Exposed Aggregate Concrete Wash Water	Exposed Aggregate Concrete Wash-Off Water. Best Management Practices.	BCRMCA	<a href="http://www.bcrmca.bc.ca/Exposed%20Agg%20Brochure.pdf">http://www.bcrmca.bc.ca/Exposed%20Agg%20Brochure.pdf</a>
Industrial	Concrete Industry Code of Practice	Ready Mix Concrete Industry Environmental Code of Practice. 1993 update.	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9326.pdf">http://www.rem.sfu.ca/FRAP/9326.pdf</a>
Industrial	Concrete Operations	Technical Pollution Prevention Guide for Ready Mix Concrete Operations	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9713.pdf">http://www.rem.sfu.ca/FRAP/9713.pdf</a>
Industrial	Exposed Concrete	Technical Pollution Prevention Guide for Exposed Concrete Operations in the Lower Fraser Basin	FRAP	Not Available
Industrial	Asphalt Preparation	Technical Pollution Prevention Guide for Asphalt Preparation Operation Operators in the Lower Fraser Basin. 1996	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9612.pdf">http://www.rem.sfu.ca/FRAP/9612.pdf</a>



Use Category	Focus	Guideline	Source	Website
Highways/ Urban Development	Road Maintenance	Road Maintenance Activities and the Fisheries Act. A Guidance Document to Avoiding Conflict. 1997.	DFO-WQ	Contact DFO Regional Library 1-604-666-6371
Highways/ Local Govt.	Road Salting	Road Salt and Winter Maintenance for B.C. Municipalities	BC MWALP	<a href="http://wlapwww.gov.bc.ca/wat/wq/bmps/roadsalt.html">http://wlapwww.gov.bc.ca/wat/wq/bmps/roadsalt.html</a>
Highways/ Urban Development	Bridge Maintenance	Guidelines for the Protection of Fish and Fish Habitat During Bridge Maintenance Operations in British Columbia. 1991.	DFO-WQ	Currently Being Revised Contact Pat Lim 1-604-666-6529
Industrial	Foundry	Technical Pollution Prevention Guide for Foundries in the Lower Fraser Basin. 1997.	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9702.pdf">http://www.rem.sfu.ca/FRAP/9702.pdf</a>
Industrial	Brewery/ Winery	Technical Pollution Prevention Guide for Brewery and Winery Operations in the Lower Fraser Basin. 1997.	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9720.pdf">http://www.rem.sfu.ca/FRAP/9720.pdf</a>
Industrial	Micro Brew and U-Brew	Technical Pollution Prevention Guide for Micro Brew and U-Brew Operations in the Lower Fraser Basin (in production)	FRAP	Not Available
Industrial	Disposal of Wood Byproducts	Mitigation of Fisheries Impacts From the Use and Disposal of Wood Residue in British Columbia and the Yukon. 1999.	HEB pub.	<a href="http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/wood_residue_bg_e.pdf">http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/wood_residue_bg_e.pdf</a>
Industrial	Wood Preservation	Technical Pollution Prevention Guide for Pressure Wood Preservation Facilities in the Lower Fraser Basin. 1997.	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9714.pdf">http://www.rem.sfu.ca/FRAP/9714.pdf</a>
Industrial/ Urban Development	Wood Treatment Guidelines	Guidelines to Protect Fish and Fish Habitat from Treated Wood Used in the Aquatic Environment in the Pacific Region. 2000.	HEB pub.	<a href="http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/guidelines/treated_wood_guidelines_e.pdf">http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/guidelines/treated_wood_guidelines_e.pdf</a>
Local Govt.	Water Main Cleaning	Best Management Practices for Pigging and Flushing Water Mains. 1997.	GVRD	<a href="http://www.gvrd.bc.ca/services/water/chlorlin/flushing.pdf">http://www.gvrd.bc.ca/services/water/chlorlin/flushing.pdf</a>
Rural/ Urban Development	Ground Water Protection	Groundwater Quality Protection Practices	FRAP	<a href="http://www.rem.sfu.ca/FRAP/gqpp.pdf">http://www.rem.sfu.ca/FRAP/gqpp.pdf</a>
Rural/ Urban Development	Septic Systems	Septic System Maintenance. Pure and Simple.	FRAP	<a href="http://www.rem.sfu.ca/FRAP/p&amp;s.pdf">http://www.rem.sfu.ca/FRAP/p&amp;s.pdf</a>
Industrial Development	Stormwater & Industry	Stormwater Best Management practices for Selected Industrial Sectors in the Lower Fraser Basin. 1997.	FRAP	<a href="http://www.rem.sfu.ca/FRAP/9703.pdf">http://www.rem.sfu.ca/FRAP/9703.pdf</a>
Urban/ Rural	Urban Stormwater	Urban Runoff Quality Control Guidelines for British Columbia. 1992.	BC	Provincial library - Victoria <a href="http://wlapwww.gov.bc.ca/epd/epdpa/mpp/stormwater/stormwater.html">http://wlapwww.gov.bc.ca/epd/epdpa/mpp/stormwater/stormwater.html</a>
Urban/ Rural	Stormwater	Stormwater Planning: A Guidebook for British Columbia		
All Categories	Sampling Guide	Pollution Field Sampling Guideline	MOE	Provincial library - Victoria
Reference Info.	Water Quality Guidelines	BC Water Quality Standards	Province of B.C.	<a href="http://wlapwww.gov.bc.ca/wat/wq/wqhome.html">http://wlapwww.gov.bc.ca/wat/wq/wqhome.html</a> - guidelines
Reference Info.	Water Quality Guidelines.	Summary of Canadian Water Quality Guidelines.	CCME	<a href="http://www.ccme.ca/assets/pdf/el_06.pdf">http://www.ccme.ca/assets/pdf/el_06.pdf</a>

## Stewardship Guidelines

Use Category	Focus	Guideline	Source	Website
Urban/ Rural Stewardship	Development near water ways	Access near Aquatic Areas: a guide to sensitive planning, design and management	Steward - ship Series	<a href="http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/access2.pdf">http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/access2.pdf</a>
Urban/ Rural Stewardship	Nature Corridors	Community Greenways: linking communities to country and people to nature	“ “ “	<a href="http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/cg.pdf">http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/cg.pdf</a>
Urban/ Rural Stewardship	Steward - ship Opportunities	Community Stewardship: a guide to establishing your own group	“ “ “	<a href="http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/comstew.pdf">http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/comstew.pdf</a>
Urban/ Rural Stewardship	Steward - ship Opportunities	Landowner Contact Guide For British Columbia	“ “ “	<a href="http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/contact.pdf">http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/contact.pdf</a>
Urban/ Rural Stewardship	Land Acquisition/ Covenants etc.	Green Legacies	“ “ “	<a href="http://www.stewardshipcentre.bc.ca/green_legacies_web/resourcesOrder.asp">http://www.stewardshipcentre.bc.ca/green_legacies_web/resourcesOrder.asp</a>
Urban/ Rural Stewardship	Steward - ship Opportunities	Naturescape	“ “ “	<a href="http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/bc_stewseries.asp">http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/bc_stewseries.asp</a>
Urban/ Rural Stewardship	Steward - ship Opportunities	Stewardship '94	“ “ “	<a href="http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/steward.pdf">http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/steward.pdf</a>
Urban/Rural Development	Municipalities and Regional Districts	Stewardship Bylaws: a guide for local government	“ “ “	<a href="http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/bylaws.pdf">http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/bylaws.pdf</a>
Urban/Rural Development	For Individual Landowners	Stewardship Options: for private land owners in British Columbia	“ “ “	<a href="http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/options.pdf">http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/options.pdf</a>
Urban/Rural Development	For Planners/ Developers	Stream Stewardship	“ “ “	<a href="http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/ssg.pdf">http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/ssg.pdf</a>
Agriculture	Agricultural Practices	Watershed Stewardship - A Guide for Agriculture	“ “ “	<a href="http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/ag.pdf">http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/ag.pdf</a>
For Individuals and Conservation Groups	Wetland Protection and Stewardship	Wetlandkeepers Handbook: a practical guide to wetland care	“ “ “	<a href="http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/wetland.pdf">http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/wetland.pdf</a>
Urban/ Rural Habitat Protection Newsletter for the Public	Local Government	Protection of Aquatic and Riparian Habitats by Local Governments (1995)	“ “ “	Contact DFO Regional Library 1-604-666-6371
	Stewardship Stories	StreamTalk - the Community Program's Newsletter		<a href="http://www.stewardshipcentre.bc.ca/sri/sridisplay.asp?sProv=bc&amp;sProduct=3674">http://www.stewardshipcentre.bc.ca/sri/sridisplay.asp?sProv=bc&amp;sProduct=3674</a>
Home Stewardship	Homeowners	Home Tips for Healthy Streams		<a href="http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/hometips_2000_e.pdf">http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/hometips_2000_e.pdf</a>

**Legislation, Regulation and Policy Guidelines**

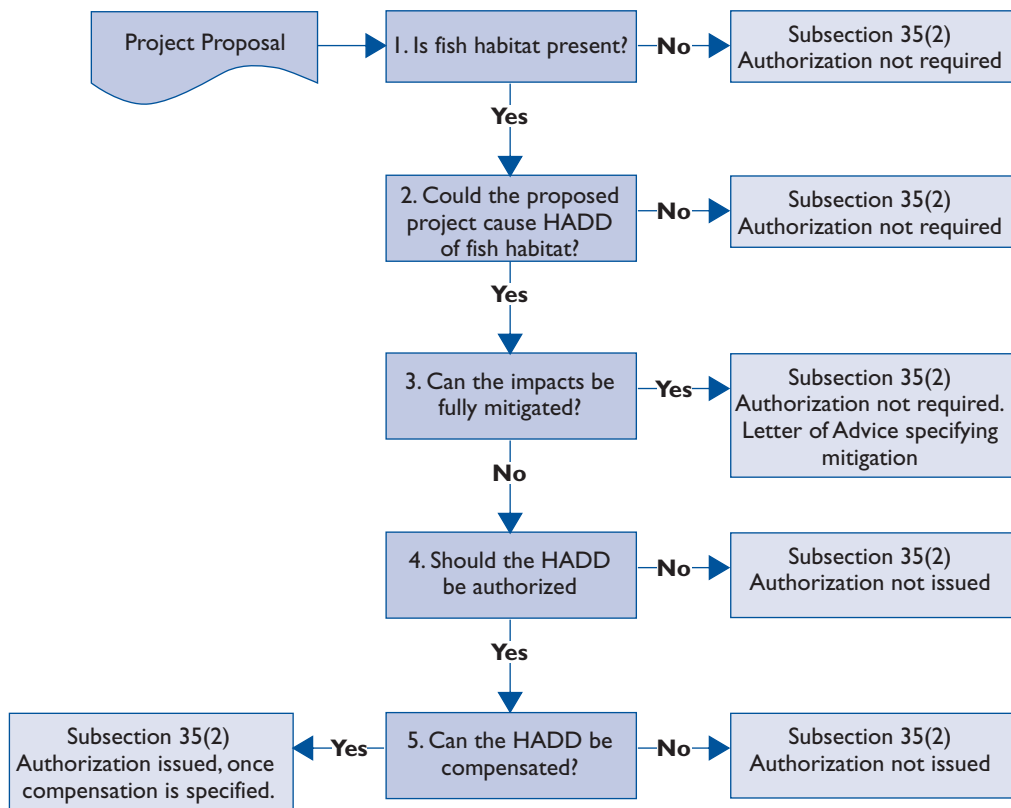
<b>Use Category</b>	<b>Focus</b>	<b>Guideline</b>	<b>Source</b>	<b>Website</b>
For DFO/ public	Environment Assessment Process Legislation	Canadian Environmental Assessment Act (CEAA)	Federal Govt.	<a href="http://www.ceaa.gc.ca/">http://www.ceaa.gc.ca/</a>
For DFO/ public	including Habitat Protection Provisions	Fisheries Act (and related acts, orders & regulations)	“ “ “	<a href="http://www.ncr.dfo.ca/commu-nic/policy/dnload_e.htm">http://www.ncr.dfo.ca/commu-nic/policy/dnload_e.htm</a>
For DFO/ public	Habitat Protection	DFO Habitat Protection and Conservation Guidelines 1986/1994	“ “ “	Contact DFO Regional Library 1-604-666-6371
For DFO/ public	Habitat Protection	Habitat Conservation and Protection Guidelines -1998	“ “ “	<a href="http://www.ncr.dfo.ca/habitat/c&amp;pguide/index_e.asp">http://www.ncr.dfo.ca/habitat/c&amp;pguide/index_e.asp</a>
For DFO/ public	Habitat Protection Policy	National Policy for the Management of Fish Habitat	“ “ “	<a href="http://www.ncr.dfo.ca/habitat/Policy/index_e.asp">http://www.ncr.dfo.ca/habitat/Policy/index_e.asp</a>
Brochure For Public	Information about the Fisheries Act	Complying with the Fisheries Act	“ “ “	<a href="http://www-heb.pac.dfo-mpo.gc.ca/habitat_policy/hablaw_article/hablaw_e.htm">http://www-heb.pac.dfo-mpo.gc.ca/habitat_policy/hablaw_article/hablaw_e.htm</a>
Brochure For Public	Includes Habitat Sections of the Fisheries Act	Canada's Fish Habitat Law	“ “ “	<a href="http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/fish_hablaw_e.pdf">http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/fish_hablaw_e.pdf</a>
For the Public	How to Comply with the Fisheries Act	What the Law Requires	“ “ “	<a href="http://www.dfo-mpo.gc.ca/habitat/law_req/index_e.asp">http://www.dfo-mpo.gc.ca/habitat/law_req/index_e.asp</a>
For DFO/ public	No Net Loss Policy	Guidelines for Attaining No Net Loss	“ “ “	<a href="http://www.dfo-mpo.gc.ca/habitat/GuideLin/english/index_e.htm">http://www.dfo-mpo.gc.ca/habitat/GuideLin/english/index_e.htm</a>
For DFO	HADD Framework	Decision Framework for the Determination and Authorization of Harmful Alteration, Disruption or Destruction (HADD) of Fish Habitat	“ “ “	<a href="http://www.dfo-mpo.gc.ca/Habitat/HADD/english/index_e.htm">http://www.dfo-mpo.gc.ca/Habitat/HADD/english/index_e.htm</a>
Bulletin for DFO/ Public	Habitat Prosecution Case Law	Habitat Enforcement Bulletins	“ “ “	<a href="http://www-heb.pac.dfo-mpo.gc.ca/Habitat_policy/bulletins_e.htm">http://www-heb.pac.dfo-mpo.gc.ca/Habitat_policy/bulletins_e.htm</a>

**Habitat Guidelines**

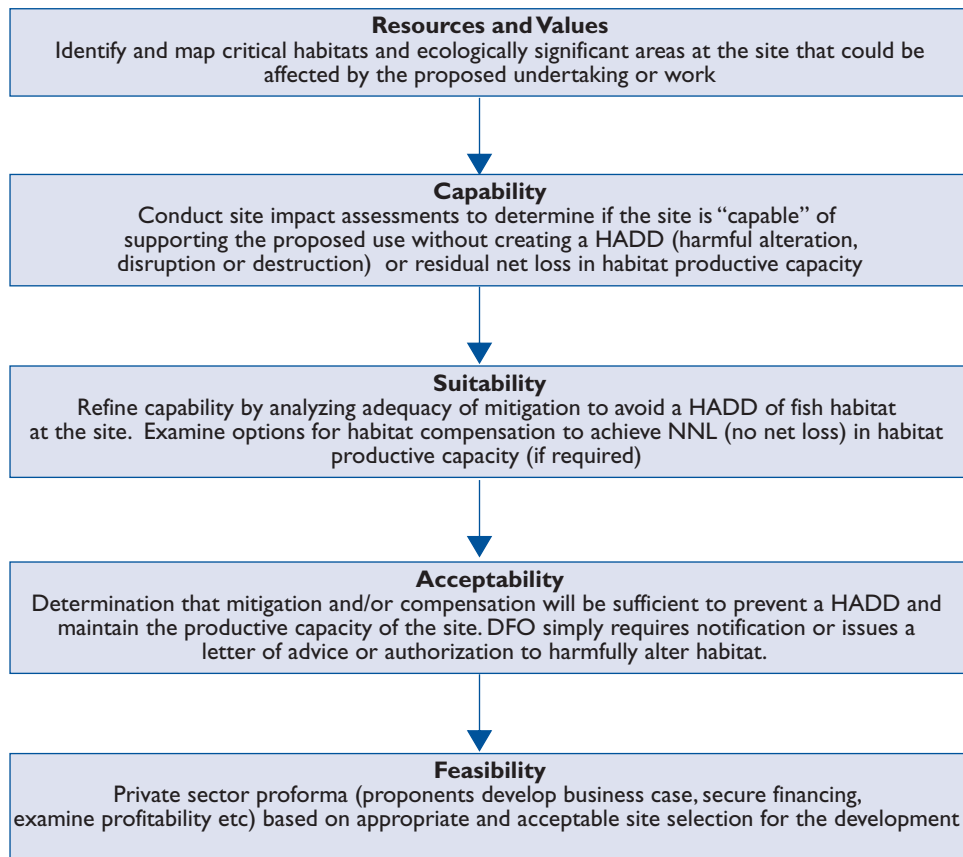
<b>Use Category</b>	<b>Focus</b>	<b>Miscellaneous Guideline</b>	<b>Source</b>	<b>Website</b>
Freshwater/ Urban/Rural/ Industrial/ local governments	Protection of Fish from impingement using screens	Freshwater Intake End-of-Pipe Fish Screen Guideline	DFO	<a href="http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/guidelines/fishscreen_intake_e.pdf">http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/guidelines/fishscreen_intake_e.pdf</a>
Industrial	Explosives	Guidelines for the use of explosives in or near Canadian fisheries waters	“ “ “	<a href="http://www.dfo-mpo.gc.ca/habitat/explosguide/english/index_e.htm">http://www.dfo-mpo.gc.ca/habitat/explosguide/english/index_e.htm</a>
Foreshore Development	Shoreline Erosion	Marine Guide to Preventing Shoreline Erosion	DFO	<a href="http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/erosion_e.pdf">http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/erosion_e.pdf</a>
Foreshore Development	Boat Launches	Marine Guide to Small Boat Launches	DFO	<a href="http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/launches_e.pdf">http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/launches_e.pdf</a>
Foreshore Development	Boat Moorage/ Docks	Marine Guide to Small Boat Moorage	DFO	<a href="http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/moorage_e.pdf">http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/moorage_e.pdf</a>
Foreshore Development	Marina Development	Marina Development Guidelines for the Protection of Fish and Fish Habitat, 1995	DFO	Contact DFO Regional Library 1-604-666-6371
Rural Development	Docks	The Dock Primer - A cottager's guide to waterfront-friendly docks	DFO	<a href="http://www.dfo-mpo.gc.ca/habitat/media/dock-primer/dock_01_e.asp">http://www.dfo-mpo.gc.ca/habitat/media/dock-primer/dock_01_e.asp</a>
Rural Development	Waterfront Stewardship	The Shore Primer - A cottager's guide to a healthy waterfront	DFO	<a href="http://www.dfo-mpo.gc.ca/habitat/media/shore-primer/shore_01_e.asp">http://www.dfo-mpo.gc.ca/habitat/media/shore-primer/shore_01_e.asp</a>
Placer Mining	Placer Authorization	Yukon Placer Authorization & Supporting Documents 1993	DFO	<a href="http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/ypa_e.pdf">http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/ypa_e.pdf</a>

Use Category	Focus	Guideline	Source	Website
Placer Mining	Guidelines	B.C. Placer Mining Guidelines	DFO	Contact DFO Regional Library 1-604-666-6371
Mining	Fish Habitat Protection Brochure	Fish Habitat & Mining	DFO	<a href="http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/fish_habitat_and_mining_e.pdf">http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/fish_habitat_and_mining_e.pdf</a>
Freshwater/Industrial	Hydro Development	Impacts of the Operation of Existing Hydroelectric Developments on Fishery Resources in British Columbia, Vol 2, Inland Fisheries Manuscript Report #2093 1991	DFO	<a href="http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/impacts_hydro_e.pdf">http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/impacts_hydro_e.pdf</a>
Urban/Rural Development	Land Development	Land Development Guidelines for the Protection of Aquatic Habitat	B.C./DFO	<a href="http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/lbg.pdf">http://www.stewardshipcentre.bc.ca/sc_bc/stew_series/pdf/lbg.pdf</a>
Urban/Rural	Fish Habitat Conservation	Watershed-Based Fish Sustainability Planning: Conserving BC Fish Populations and their Habitat. A Guidebook for Participants		<a href="http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/sustainability_planning_e.pdf">http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/sustainability_planning_e.pdf</a>
Freshwater	Location Information	Where and When to See Salmon	DFO	<a href="http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/where-when_to_see_e.pdf">http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/where-when_to_see_e.pdf</a>
Forest Industry	Forest Practices Code	Forest Practices Code Guidebook Series Riparian, Biodiversity, Gully Mgmt., Site Disturbance, Fish and Stream I.D., Road Engineering, Channel Assessment, Terrain Stability	Province of B.C.	<a href="http://www.for.gov.bc.ca/tasb/legsregs/fpc/FPCGuide/Guidetoc.htm">http://www.for.gov.bc.ca/tasb/legsregs/fpc/FPCGuide/Guidetoc.htm</a>
Forest Industry	Stream Crossing	Stream Crossing Guidelines	Province of B.C.	Provincial library - Victoria
Forest Industry	Fish/ Forestry Guidelines	B.C. Fisheries/Forestry Guidelines	Province of B.C.	Provincial library - Victoria
Forest Industry	Watershed Assessment	Coastal Watershed Assessment Procedure Guidebook (CWAP)	Province of B.C.	<a href="http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/coastal/cwaptoc.htm">http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/coastal/cwaptoc.htm</a>
Forest Industry	Landslides	Guide for Mgmt. Of Landslide-Prone Terrain	MOF	Provincial library - Victoria
Forest Industry	Pesticide Application	Pesticide Application Guide	MOF	Provincial library - Victoria
Watercourses	Inventory	Lake and Stream Inventory Standards	MOE	Provincial library - Victoria
Watercourses	Restoration	Watershed Restoration Program Series: Skills I.D., Fish Habitat Assessment, Experimental Designs, Assessment Procedures, Monitoring and Restoration Techniques etc.	Province of B.C.	Provincial library - Victoria



**DFO Decision-making Flowchart Respecting Approval of Works**

Source: DFO Habitat Conservation and Protection Guidelines, 1988

**DFO Determination of Use Acceptability at the Site Scale**



## Appendix 7: Legislation and Regulations

Act /Responsible Agency	Authority	Coastal Management
<b><i>BC Land Act</i></b> Ministry of Water, Land and Air Protection Land and Water BC Inc.	<p>Governs uses of Crown lands through planning, leasing (e.g., aquaculture and shellfish harvesting), issuing easements (i.e., pipelines, power cables, etc.) or licensing to occupy (i.e., wharves, etc.) and setting policy for the disposition of Crown lands (i.e., sale or reservation).</p> <p>The Act provides that Crown land below the natural boundary of a body of water must not be disposed of by Crown Grant, except by order of the Lieutenant Governor in Council (i.e., almost all of the land below high tide remains the property of the provincial Crown).</p>	<p>The Act governs the initial, key decisions to allow any new or continuing activity on nearshore Crown land. Under the BC Land Act, authorities may prevent or allow uses that impact nearshore. It can be used to authorize the commitment of coastal areas for conservation under other statutes (e.g., <i>Municipal Act</i>, <i>Park Act</i>, <i>Wildlife Act</i>, etc.).</p> <p>Approval must be obtained before any building on or altering of upland, foreshore and intertidal areas. Recent changes in government legislation have moved the responsibility of day-to-day administration of land disposition from MWALP to the Land and Water BC Inc. (LWBC) including approving Crown land reserves, tenures and sale of Crown land. MWALP is now responsible for recommending and administering Crown land disposition and land-use legislation and policies.</p>
<b><i>BC Land Title Act</i></b> Ministry of Water, Land and Air Protection Land and Water BC Inc.	Regulates the registration of legal title for and subdivision of all lands. Provides authority for the registration of covenants against a title and the designation of conservation organizations authorized to enter into	Provisions of the Act require the dedication of public access to marine water when waterfront land is subdivided. Covenants can be used to protect habitats by landowners, Crown agencies and designated conservation organizations.
<b><i>BC Wildlife Act</i></b> Ministry of Water, Land and Air Protection	Regulates game harvest limits and methods, the import, export, possession or transport of wildlife or disturbance of wildlife. It authorizes the purchase of private land and the creation of Wildlife Management Areas and Wildlife Sanctuaries. It provides for the designation of endangered or threatened vertebrates and the protection of their habitats within a Critical Wildlife Management Area.	The Act contains limited prohibitions against the damage or destruction to wildlife habitat, including the nests of birds and lands within a Wildlife Management Area. There is no requirement to list endangered or threatened species or to protect their habitats. New law to control the introduction and possession of alien species is under consideration.
<b><i>BC Park Act</i></b> Ministry of Water, Land and Air Protection	Authorizes securing land for provincial parks; regulates all uses in provincial parks.	The Act is one of the main avenues for the province to establish Marine Protected Areas. Previous marine park development has generally been for recreational purposes. However, BC Parks Conservation Management: Part One Conservation Program Policies for marine systems provides a strong conservation Focus for new parks. The Act strictly controls and limits impact on habitats in parks and recreation areas. However, the Act does not have the authority to establish strict no-taking of fish (i.e., establish refugia capability).

**Act /Responsible Agency****Authority****Coastal Management*****Local Government Act***

Ministry of Community, Aboriginal and Women's Services

The Act authorizes municipal and regional governments to exercise authority over land use planning, regulation (i.e. zoning), development approval, and servicing in their jurisdiction.

Local government authority applies to all lands. However, the local government regulation of Crown land is subject to Section 4 of the Interpretation Act which gives the province prerogative where using lands for its own purpose. Federal lands are not subject to local jurisdiction (i.e. Indian Reserves). The provincial government retains senior authority and can be the primary regulator of land use. Local government powers are limited over lands designated for forestry or agriculture. Local governments have jurisdiction over intertidal and sub tidal lands subject to the *Interpretation Act*.

The provincial government amended the Local Government Act in 2000 to provide regional districts and their member municipalities with a framework for creating strategies to control growth at the regional level. The amendment included provincial goals to guide the development of regional growth strategies. A further amendment in 1997 enables local governments to address the protection, restoration and enhancement of the natural environment, its ecosystems and biodiversity. The authority to develop Official Community Plans (OCPs) affords the designation of lands for open space or conservation. Powers to create bylaws can be used to protect shorelines, trees, wetlands and watercourses and to control soil removal and flooding.

Land use zoning can positively or negatively impact nearshore habitat or other lands whose use can affect nearshore habitats. For example, zoning can be used to create buffers around wetlands and to regulate uses around sensitive habitats. OCPs can require proponents to assess environmental impacts of proposed developments, to provide disposal of surface run-off and storm water and to limit the area covered by impermeable materials in any development. Municipalities can exempt landowners from property tax on riparian land subject to a conservation covenant held by the municipality. Where new bylaws come into effect, existing uses can continue as nonconforming until such time as a landowner applies for a structural alteration, change of use or subdivision. Municipalities and regional governments can buy sensitive habitats for parks and heritage conservation. They can also regulate sewage works and waste removal.

Local authorities can prevent environmental impacts whereas many federal and provincial authorities only provide for redress after damage has occurred. Local governments are not compelled to protect, restore or enhance nearshore or other habitats, although they must meet provincial water quality objectives set under the *BC Waste Management Act*.

Generally, most local governments do not have the staff expertise or financial resources to address habitat interests, and require federal or provincial support. Local governments are likely to request financial support from the federal or provincial governments to buy land or for other forms of compensation.

***Forest Practices Code Act***

Ministry of Forests

This law consists of enabling legislation, regulations, standards and guidebooks to be used to regulate forest practices in BC. It applies to all Crown land in provincial forests, wilderness areas and private lands licenced under the *Forest Act* of BC. Other private lands are not governed by the code except as provided under section 216.

The code addresses timber harvesting, road engineering, silviculture and soil conservation relative to accepted environmental criteria such as riparian protection and management areas, inventories, terrain hazard, soil stability and watershed assessments, biodiversity protection, visual values and wilderness preservation. The code is used to establish Riparian Management Areas (RMA) around fish-bearing water bodies or in community watersheds. RMAs contain zones with different levels of protection from timber harvesting. Coastal habitats are not specifically addressed in the code, but estuaries and areas classified as Marine Sensitive Zones (MSZ) can be protected through specific forest



Act /Responsible Agency	Authority	Coastal Management
		<p>practices. MSZs must be identified in forest development plans required under the code. MSZs are legally binding as soon as they are approved. The Riparian Management Area Guidebook (RMAG) sets guidelines for practices in MSZs, including those for log handling in marine areas and the treatment of MSZs as downstream values. The RMAG outlines stream classifications where reserve zones and management zones are located.</p> <p>The general forest practices provisions of the code and the specific reference to the identification and protection of resource features apply to coastal areas not protected by a MSZ. Sensitive features in coastal habitats need to be recognized as “known resource features” and brought to the attention of the Ministry of Forests for inclusion in forest practices (e.g., commercial shellfish harvesting areas are now recognized).</p>
<p><b><i>BC Mines Act</i></b> Ministry of Energy and Mines</p>	<p>Regulates the exploration, development, operation and closure of mining operations. Permits or licences are required for those activities. The Act authorizes the creation of a mine reclamation fund to cover the costs of mine reclamation where the owner fails to do so. The posting of security to mitigate impacts to watercourses and to reclaim a mine can be required.</p>	<p>A moratorium on oil, gas and mineral exploration off B.C.’s coast, established in 1972, remains in place. The federal and provincial governments have not yet reached agreement on the development of those resources and how to share revenues.</p>
<p><b><i>Mineral Tenure Act</i></b> Ministry of Energy and Mines</p>	<p>The Province grants surface and subsurface rights separately. Some parcels of private land granted in earlier years included subsurface rights. For the most part, the Province owns all mineral rights on what is generally called “mineral lands” which includes both private and Crown land. Individuals and companies may acquire these rights from the Province.</p> <p>Mineral rights are issued by the Mineral Titles Branch of the Ministry of Energy and Mines according to the <i>Mineral Tenure Act</i>.</p> <p>Mineral rights exclude earth, soil, marl, peat, sand, gravel and rock used for construction purpose.</p> <p>There is currently a federal and provincial moratorium on the exploration and development of offshore oil and gas deposits and the Province has suspended the issuance of mineral, placer and coal tenure over sub tidal and intertidal lands.</p>	<p>Staking and subsequent exploration and development activities may occur on coastal nearshore lands under the Act. The <i>Mineral Tenure Act</i>, <i>Coal Act</i>, <i>Mines Act</i> and associated Mineral Exploration Code contain strong provisions for recognizing and minimizing potential impacts on the environment, wildlife and other special values.</p>

Act /Responsible Agency	Authority	Coastal Management
<b><i>Animal Disease Control Act</i></b> Ministry of Agriculture, Food and Fisheries	<p>The Act, administered by the Provincial Veterinarian, provides a statutory authority to limit the spread of contagious diseases in animals, including aquatic animals.</p> <p>Discussed are the duties and powers of inspectors appointed under the Act, obligations of owners of animals and quarantine procedures.</p>	<p>Limiting the spread of contagious diseases in aquaculture operations decreases the risk of infection of wild fish stocks in the vicinity and also increases the economic sustainability of the industry and the coastal communities to which it contributes.</p>
<b><i>Farm Practices Protection (Right to Farm) Act</i></b> Ministry of Agriculture, Food and Fisheries	<p>The Act enables farmers to farm in agricultural land reserves or on licenced aquaculture sites by exempting them from nuisance lawsuits, nuisance bylaws and prohibitive injunctions if they employ normal farm practices. It also ensures that a local government may not restrict normal farm activities without approval from the Minister of Agriculture, Food and Fisheries. The Act establishes a complaint resolution process, which includes the establishment of a Farm Practices Board. The Minister may also publish and distribute standards in relation to farming areas, including licenced aquaculture sites, for the guidance of local governments in preparing rural land use bylaws, zoning and other bylaws. Local governments may also make bylaws to regulate of farm activities subject to approval of the Minister of Agriculture, Food and Fisheries</p>	<p>These provisions help to ensure sustainable management of the aquaculture industries, by ensuring a cooperative arrangement for land use regulation between local governments, industry and the provincial government. The complaint resolution process also provides an efficient and cost-effective way to ensure that marine aquaculture activities adhere to normal farm practices, thereby contributing to the social sustainability of coastal communities. The complaint resolution process could also be used as a vehicle to address and mitigate microbial contamination of shellfish growing areas from upland agricultural pollution.</p>
<b><i>Farming and Fishing Industries Development Act</i></b> Ministry of Agriculture, Food and Fisheries	<p>The purpose of the Act is to enable producers of commodities of farming and fishing industries to collect levies approved by the Lieutenant Governor in Council. The Minister can establish a council to administer the levied funds for the benefit of industry by way of market development, promotion and research.</p>	<p>While not directly related to the management of coastal resources, this Act affects the economic sustainability of seafood industries on the coast, thereby affecting the sustainability of coastal communities.</p>
<b><i>Fish Inspection Act</i></b> Ministry of Agriculture, Food and Fisheries	<p>The Act ensures quality and wholesomeness in the fish industry by providing the authority to regulate activities concerning the handling, processing, storing, grading, packaging, marking, transporting, marketing and inspection of fish and fish products. The regulations ensure that fish processed and sold within British Columbia have met specific requirements.</p>	<p>This ensures that efforts are made throughout the production line to maintain high food quality. Given that the quality of the food depends to a significant degree on the quality of the seafood-growing environment, the seafood industries will seek growing and harvesting areas that have high quality. This influences the land allocation process because a variety of other resource users in addition to the seafood industries often compete for sites in a high quality environment, necessitating careful and equitable resource planning and allocation at local and site-specific scales.</p>

Act /Responsible Agency	Authority	Coastal Management
<p><b><i>Fish Protection Act</i></b> Ministry of Water, Land and Air Protection Ministry of Agriculture, Food and Fisheries</p>	<p>The Act is primarily implemented by the Ministry of Water Land and Air Protection, and protects the province's fisheries resource by ensuring water for fish, protecting and restoring fish habitat, focusing on riparian protection and enhancement, and strengthening local environmental planning, including marine areas.</p>	<p>Maintaining fish habitat on upland areas helps to ensure the quality of coastal environments as well as the sustainability of anadromous fish. The provision for marine planning also provides a mechanism to maintain the quality of marine environments for fish.</p>
<p><b><i>Fisheries Act</i></b> Ministry of Agriculture, Food and Fisheries</p>	<p>The Act provides for the licensing and regulatory control of activities associated with commercial fisheries and aquaculture operations. The primary concerns are licensing of: fish processing plants; fish buying establishments; fishermen selling their own catch; wild oyster and marine plant harvesting; and all commercial aquaculture operations within the province, whether on private or Crown land. This Act provides the mechanism for regulatory control over aquaculture and provincially regulated fish harvesting in marine areas. As such it helps to ensure the sustainability of coastal marine areas through a number of regulatory provisions attached to Aquaculture Licences or harvesting permits as well as inspection and enforcement staff and activities.</p>	<p>This Act provides the mechanism for regulatory control over aquaculture and provincially regulated fish harvesting in marine areas. As such it helps to ensure the sustainability of coastal marine areas through a number of regulatory provisions attached to Aquaculture Licences or harvesting permits as well as inspection and enforcement staff and activities.</p>
<p><b><i>Canada Oceans Act</i></b> Department of Fisheries and Oceans Canada</p>	<p>The Act is a consolidation of Canada's ocean-related legislation. It provides authority for the DFO Minister to lead the development of a strategy and integrated management plans for estuarine, coastal and marine ecosystems based on public input and the principles of sustainable development, integrated management and the precautionary approach. The Act affords the creation of national Marine Protected Areas. Marine Protected Areas may be designated for the conservation and protection of commercial and non-commercial fishery resources, which includes, for the purposes of this Act: marine mammals and their habitats; endangered or threatened marine species; unique habitats; marine areas of high biodiversity or biological productivity; or any other marine resource or habitat necessary to fulfill the Minister's mandate.</p>	<p>The Act can be used for the development of a coast wide strategy for the maintenance and management of marine ecosystems and the creation and protection of marine protected areas. The authority to control harmful activities is limited to marine protected areas</p>

Act /Responsible Agency	Authority	Coastal Management
<b><i>Canada Fisheries Act</i></b> Department of Fisheries and Oceans Canada	Regulates fish harvest limits and methods, the import, export, possession, rearing or transport of fish, or the harming of fish or their habitat <sup>2</sup> . The Minister has authority to require plans and specifications to assess a proposed activity in significant fish habitat and to require mitigation of impacts to fish habitat. Freshwater-fish harvest, aquaculture and fish farms are regulated by MWLAP in cooperation with DFO.	Facilitates the setting of safe harvest limits and affords prevention of harvest or harvest methods that impact fish. The Act prohibits any alteration of, destruction of, or damage to habitat, including harmful substances, such as sewage, except as may be authorized by regulations or the Minister. Mitigation measures may include the placement and maintenance of fish ways, barrier screens, etc. The Act can regulate the introduction of exotic, marine species through shipping. Regulations set minimum standards for BOD, TSS and non-toxic effluents.
<b><i>National Marine Conservation Areas Act</i></b> Parks Canada	Provides authority to create large national marine protected areas that can be zoned for multiple uses.	Can protect significant marine areas (i.e., much of Moresby Island within the Queen Charlotte Islands).
<b><i>National Park Act</i></b> Parks Canada	Provides federal authority to establish and manage national parks and protected areas through fees, simple acquisition, or the transfer of provincial Crown land.	The Act affords opportunities to create national parks on land. The <i>Marine Conservation Area Act</i> (not promulgated) provides the legislated bases to establish marine protected areas.
<b><i>Canada Wildlife Act</i></b> Environment Canada	Provides federal authority to establish and manage National Wildlife Areas through fees, simple acquisition, or the transfer of provincial Crown land.	The Act affords opportunities to create National Wildlife Areas, but only over land or marine areas under control of Environment Canada.
<b><i>Migratory Birds Convention Act</i></b> Environment Canada	Regulates the harvest, possession and transport of migratory birds.	It is the federal legislation used to establish annual, sustainable harvest levels for migratory game birds
<b><i>Canada Environmental Assessment Act</i></b> Environment Canada	Regulates the review and approval of federally funded, initiated or regulated activities. Environmental assessments may also be triggered by a number of provisions under the <i>Canada Fisheries Act</i> . Screenings or assessments are required for most new or expanded activities on federal Crown lands.	It is harmonized with the <i>BC Environmental Assessment Act</i> . Coastal habitats can be protected on federal and provincial Crown lands and private lands. Full public reviews are required of projects involving significant impacts.
<b><i>Canadian Environmental Protection Act</i></b> Environment Canada	Regulates the production and control of toxic substances, including their development, manufacture, importation, transportation, distribution, storage, use, environmental release and disposal. Regulates ocean dumping and, as part of the approval process, it requires public notification. Minimum national standards are set by regulation for the discharge of chlorinated dioxins and furans and for the elimination of those same chemicals from defoaming agents and wood chips used in the manufacture of pulp.	The Act assures safe limits on the entry of toxic substances into nearshore habitats. A 96% reduction in dioxins and a 97% reduction in furans occurred in pulp-mill effluents between 1990 and 1994, following enactment of regulations in 1990 and 1992. Fish and other aquatic organisms may still suffer persistent ill effects from those and other chemicals. Studies are underway to determine if such effects are present.



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