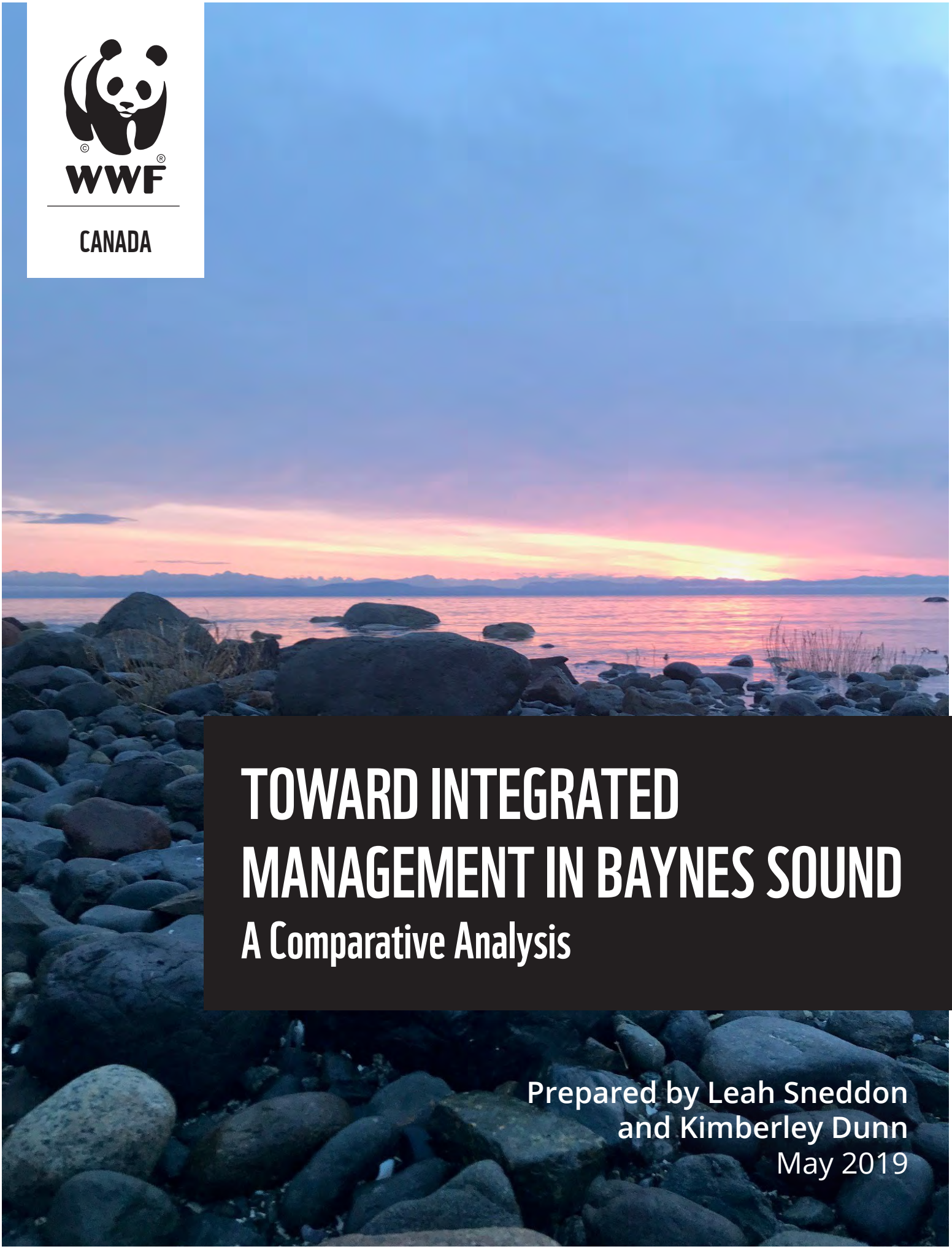

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CANADA

TOWARD INTEGRATED MANAGEMENT IN BAYNES SOUND

A Comparative Analysis

Prepared by Leah Sneddon
and Kimberley Dunn

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List of Abbreviations

BSCPSA: The Baynes Sound Coastal Plan for Shellfish Aquaculture

CVRD: Comox Valley Regional District

DFO: Fisheries and Oceans Canada

EBM: Ecosystem-based Management

EBSA: Ecologically and Biologically Significant Area

ECCC: Environment and Climate Change Canada

FWCP: Fish and Wildlife Compensation Program

IBA: Important Bird Area

IFMP: Integrated Fisheries Management Plan

IGMF: Integrated Geoduck Management Framework

IMAP: Integrated Management of Aquaculture Plan

OCP: Official Community Plan

PNCIMA: Pacific North Coast Integrated Management Area

PRWAP: Puntledge River Watershed Action Plan

RDN: Regional District of Nanaimo

RGS: Regional Growth Strategy

SARA: Species at Risk Act

Ocean SAMP: Ocean Special Area Management Plan

EXECUTIVE SUMMARY

This report assesses the current degree of integration among existing management plans for Baynes Sound/Lambert Channel, located on the eastern shore of Vancouver Island in British Columbia. The marine region is a source of significant ecological productivity as well as economic activity. It is the highest ranked cumulative and spawning area for herring in the Strait of Georgia and is a critical feeding and overwintering area for waterbirds. Baynes Sound also supports the highest density of intertidal shellfish aquaculture in British Columbia, producing over half of all the shellfish cultured in the province. The purpose of this report was to comparatively assess each of the existing management plans to determine the current degree of integration and to identify opportunities to advance an integrated approach to management of the Baynes Sound/Lambert Channel ecosystem.

Prior to the analysis, a review of peer-reviewed literature was conducted to identify the key principles of ecosystem-based management. These principles, which related to spatial and temporal scales, management of human activity and ecosystem-level management, helped to provide a framework for the assessment. There were 29 documents selected in total, which included plans produced by various types of government (local, municipal, provincial, First Nations and federal) in various stages of implementation. A content analysis was used to comparatively assess the management plans, and management content was extracted using a coding system, based on key principles of ecosystem-based management, and comparatively examined via a semi-quantitative analysis.

Grouped management summaries initially provide an overview of regional context as well as the current state of management. There are many governing bodies involved in Baynes Sound/Lambert Channel and although each has a distinct management role, there are overlapping boundaries, responsibilities and management considerations. Following this section, the results of the assessment are displayed in a comparative chart, which summarizes the purpose of each of the plans, the spatial and temporal scales, species-specific management as well

as ecosystem-level management objectives. Following the tabular presentation, results are examined in further detail to identify the opportunities and challenges for further integration of management moving forward.

The results of the analysis indicate that the existing management plans have all been developed independently, and largely are not integrated. However, several common management elements emerged and were discussed as opportunities for improving integrated management going forward. The most prevalent of these opportunities stems from a near-universal interest in ecosystem-level health found in the plans. Many of the opportunity areas identified have strong management connections to each other, across sectors, spatial zones, and species, further strengthening the foundation for improved integration. The results also highlighted challenges for the further integration of management in the region, including the complexities of governance and the need for a shared vision for the region.

As a region of significant ecological productivity and economic activity, the sustainable management and development of Baynes Sound/Lambert Channel suggests an integrated approach. Though this report identified the strongest opportunities for improving integrated management, a comprehensive integrated and ecosystem-based approach to management in Baynes Sound would weave management efforts across spatial zones, species, time and activities for the long-term benefit of all.

1. INTRODUCTION

1.1. Integrated Management

The ability of the oceans to maintain their diversity and productivity is being increasingly compromised by a number of environmental threats, including over-exploitation, pollution from land-based and sea-based activities and the alteration and destruction of habitats and ecosystems (United Nations Environmental Programme (UNEP), 2011; Government of Canada (GOC), 2002). To achieve sustainable functioning, integrated management has been widely adopted as a strategy to conserve and protect ecosystems while continuing to provide opportunities to expand wealth in marine economic sectors and coastal communities (GOC, 2002). Integrated management is a holistic approach that aims to overcome the fragmentation of traditional single-sector approaches and diverse governance arrangements by integrating ecological, social, economic, and institutional perspectives (Leslie et al., 2015).

Likewise, ecosystem-based management (EBM) is an integrated approach that goes beyond examining a single issue, species or ecosystem function and considers the ecosystem as a whole (UNEP, 2011). The core premise for EBM is that a healthy functioning ecosystem is better able to provide services that humans want and need than a degraded system (Leslie et al., 2015). EBM for marine and coastal areas aims to maintain, restore or improve marine ecosystems and associated coastal communities (Leslie et al., 2015). Though it is inherently a place-based approach, EBM extends beyond jurisdictional boundaries to manage each human activity on a scale that encompasses its impacts on marine and coastal ecosystem function (UNEP, 2011).

Canada has made national commitments to pursue an integrated approach for the management of its ocean territory. In 1997, the Government of Canada adopted the *Oceans Act*, comprehensive legislation that provides a framework for an integrated ecosystems approach to the management of coastal, estuarine and marine environments. The Preamble of the *Oceans Act* states that conservation, based on an ecosystem approach, is necessary to maintain

biological diversity and productivity in the marine environment (Oceans Act, 1996). In 2002, *Canada's Ocean Strategy* was released in response to the legislative and policy requirements outlined in the *Oceans Act* (GOC, 2002). The *Ocean Strategy* is based on three principles: sustainable development, integrated management and the precautionary approach. The implementation of the strategy commits the Canadian government to ensuring that the *Oceans Act* principles guide all ocean management decisions (GOC, 2002). According to *Canada's Ocean Strategy*, an integrated approach is key to implementing the principles of EBM to fulfill the mandate of the *Oceans Act*.

Though there is no universal consensus on what principles should be included within EBM, a review of EBM literature has identified several key principles that appear most frequently, including (in descending order of importance): consideration of ecosystem connections; appropriate spatial and temporal scales; adaptive management of human activities; use of scientific knowledge; and integrated management (Long et al., 2015). EBM initiatives recognize the inherent linkages between ecosystem components, such as biotic and abiotic interactions, and incorporate these associations into management decisions (Arkema et al., 2006). Management decisions should also recognize the cumulative effectives of human activity and evaluate all sectors that impact or are impacted by the ecosystem (UNEP, 2011). Additionally, EBM management plans have spatially explicit boundaries and include long-term ecosystem-related objectives (Long et al., 2015).

The Pacific North Coast Integrated Management Area (PNCIMA) plan, released in 2017, is a recent example of an integrated management initiative in Canada that explicitly incorporates key principles of EBM into a framework that guides goals, objectives and strategies (PNCIMA Initiative, 2017). The purpose of the EBM framework is to achieve integrity of the marine ecosystems in PNCIMA, support human well-being, promote collaborative, effective transparent and integrated governance, and to improve understanding of marine ecosystems (PNCIMA Initiative, 2017). Although national integrated management initiatives have primarily been applied to management of large ocean management areas, like PNCIMA, EBM approaches can be used to manage local-level marine systems. One such example is the Ocean Special Area Management Plan (Ocean SAMP), a regulatory tool created to manage the development and protection of Rhode Island's marine resources within the study area (Rhode Island Coastal Resources Management Council, 2010). The Ocean SAMP was designed as an expression of EBM, aiming to promote a functioning marine ecosystem that is both ecologically sound and economically beneficial (Rhode Island Coastal Resources Management Council, 2010).

1.2. Baynes Sound/Lambert Channel

1.2.1. Ecological Overview

Baynes Sound/Lambert Channel, located on the east coast of Vancouver Island in British Columbia, is an ecologically, economically and culturally significant region that would benefit from a coordinated EBM approach. It is situated within the internal marine waters of the Strait of Georgia ecoregion, the smallest marine region in Canadian waters (Levesque & Jamieson, 2015). Baynes Sound borders Vancouver Island to the west and Denman Island to the east. Lambert Channel borders Denman Island to the west and Hornby Island to the east. The waters comprise a highly productive ecosystem, characterized by thermally stratified waters and soft substrate (Jamieson & Levesque, 2014).

This marine region has been recognized as an Ecologically and Biologically Significant Area (EBSA) by the federal government, which means it is an area that calls for enhanced management beyond the needs of individual species (Jamieson & Levesque, 2014). Baynes Sound/Lambert Channel is the highest ranked cumulative and spawning area for herring in the Strait of Georgia ecoregion (Jamieson & Levesque, 2014). The region is also important for several species of Pacific salmon. There are numerous salmon bearing streams that enter the Sound and provide pathways for migration (British Columbia Ministry of Sustainable Resource Management (BCMSRM), 2002). Baynes Sound/Lambert Channel is internationally recognized as a critical feeding and overwintering area for migratory birds (IBA Canada, n.d.). Marine birds flock to the waters during the springtime when Pacific herring are spawning, to forage on the abundant food source (Levesque & Jamieson, 2015). The Sound is home to numerous at-risk species, including Great Blue Herons (special concern), Marbled Murrelets (threatened) and Peregrine Falcons (special concern). The marine region has also been identified as an important foraging area around haul-out sites for Steller Sea Lions (special concern) and Pacific Harbour Seals (Jamieson & Levesque, 2014).

1.2.2 Socio-Economic Overview

The Baynes Sound/Lambert Channel area is located within the traditional territories of several First Nations, including K'ómoks First Nation, Qualicum First Nation, Tla'amin Nation, among others. Several communities populate the coast of Baynes Sound/Lambert Channel, including communities on Vancouver Island, Hornby Island and Denman Island. The region is affected by an increasing number of socio-economic stressors, the most pressing of which are resource development, urbanization, shellfish aquaculture and harvesting of wild fish and marine plants (Stewarding the Sound, 2014). Due to the high level of ecological productivity, the waters support a number of fisheries, targeting several species of forage fish, Pacific salmon and intertidal clams. Baynes Sound also supports the highest density of intertidal shellfish

aquaculture in British Columbia, producing over half of all the shellfish cultured in the province (Murray and D'Anna, 2015). The industry has become a major employer in the area and is estimated to directly provide 100 local jobs (Fisheries and Oceans Canada (DFO), 2017).

In recent years, there has also been an expansion in seaweed harvesting activities along the shoreline. Since 2012, the Ministry of Agriculture has permitted the harvest of a non-native species of red algae, *Mazzaella japonica*, along the shoreline from Deep Bay to Parksville (Birtwell et al., 2013). As the harvestable quotas permitted by the province have increased[1], so have concerns about the potential impacts of this activity on the surrounding ecosystem (Stewarding the Sound, 2014).

1.2.3. Purpose of this Report

Baynes Sound/Lambert Channel is presently managed through a sectoral approach, whereby a large number of management initiatives produced by governments and stakeholders are in place to manage various geographic zones and human activities. This is due, in part, to the jurisdictional complexity of the region. There is also ecological interplay between the dominant economic sectors, which are primarily natural resource-based. The sectoral plans are not formally integrated and largely lack coordination, operating independently of one another.

Today, there are nearly 30 management plans at various stages of implementation for Baynes Sound/Lambert Channel coastal and marine areas. Although these documents have the potential to contribute to long-term management of the area, most do not formally recognize one another, nor do they seek to manage in a coordinated manner to ensure ecosystem health. The purpose of this report is to compare and analyze the existing management plans for the Baynes Sound/Lambert Channel marine ecosystem, identifying opportunities and challenges to lay the foundation for the future progress of integrated EBM. The main objectives are to identify the extent to which the various management plans are already integrated, and to describe areas where integrated management could be improved.

To achieve these objectives, this report assesses the degree of integration among each of the relevant management plans. Following a description of research methodology, grouped management summaries are provided for regional context and a general overview of current management. The results from the content analysis are then presented in a comparative chart, which details spatial and temporal scales, human activities, species-specific management and ecosystem-level management. Each of these management themes are then comparatively analyzed to identify common elements in current management initiatives as well as potential opportunities to enhance integrated EBM.

[1] According to Holden et al. (2017), a 900-tonne quota was approved in 2014/2015 and was increased to 1500 tonnes for the 2015/2016 season.

2. RESEARCH METHODOLOGY

An assessment of peer-reviewed literature was conducted to determine key principles of EBM that should be included in an integrated coastal plan (Arkema et al., 2006; Long et al., 2015; PNCIMA, 2017; UNEP, 2011). Relevant EBM principles considered specific ecological elements, human dimensions and management criteria (Table 1). These principles were used as a framework to evaluate current management practices for Baynes Sound/Lambert Channel, identifying common elements between plans to lay the foundation for future integrated management.

Table 1
Key EBM principles identified in peer-reviewed literature assessment.

PRINCIPLE	DESCRIPTION
Ecosystem-Level Management	Planning considers ecosystem-level management, involving habitats and species interactions.
Temporal Scale	The management plan forecasts long-term perspectives.
Spatial Scale	The spatial scale of the management area has defined boundaries.
Management of Human Activities	Management considers interactions among human activities, as well as between human activities and the environment, and are managed to minimize conflict.
Integration	Plans are integrated vertically and horizontally, and across similar temporal and spatial scales.
Adaptive Management	Management is responsive to changing circumstances and conditions.

A content analysis was conducted to comparatively assess the management documents. To obtain the documents, a broad Internet search was performed to assemble documents relevant to the scope of the report. The geographical scale of the planning area includes the marine ecosystem that comprises Baynes Sound/Lambert Channel, including the intertidal and coastal environments (encompassing Denman and Hornby Islands), as well as connected watersheds (e.g. K'ómoks Estuary) and nearshore landward areas. Upland of Baynes Sound, there is an active mining industry; however, the potential effects of run-off from this industrial activity were not examined in this analysis.

After compiling the initial list of management plans, documents were then further selected based on subject matter and structural organization. Eligible plans were management oriented, and contained objectives and strategies related to marine and coastal environments. For instance, *Keeping It Living* is a vision document for K'ómoks Estuary with suitable geographic relevance;

however, it was excluded from the analysis because it does not directly manage the estuary. Additionally, management plans were included if they were the latest available from a particular agency, regardless of whether they were fully implemented. The publications selected for this analysis were downloaded from the official websites of various government and stakeholder interest groups, each of which is publicly accessible[2]. There were 29 documents selected in total, which included municipal development strategies, spatial management strategies and sectoral management strategies (Table 2).

To search for relevant provincial and federal species management plans, it was first necessary to identify species at risk (*Species at Risk Act* (SARA), IUCN Red- and Blue-listed) with populations located in Baynes Sound/Lambert Channel (Appendix A). The inventory of species listed by Fisheries and Oceans Canada (DFO) in the Strait of Georgia ecoregion EBSA report and Important Bird Areas (IBA) Canada were collated, and each species run through provincial and federal databases: the *BC Species & Ecosystems Explorer* and the *Species at Risk Public Registry* (Data Centre, 2019; Government of Canada, n.d.). These databases provided the species management plans, if available. Though there may be additional at-risk species present in the area that were not listed in these documents, they were not included in the analysis.

To compare existing management plans, data from the Baynes Sound/Lambert Channel management documents were assessed using content analysis (Krippendoff, 2013). This method applies a consistent set of criteria to code the texts, which are subsequently organized into broader categories. A code list was iteratively developed during the analysis (Appendix B). Coded texts were further organized into categories, which are based on key principles of EBM, to allow for direct comparison between and among the plans. Categories derived from EBM principles included spatial and temporal scales, ecosystem-level management, anthropogenic activities and policy aims/objectives. Since the scope of some of the documents was broader than the scope of this analysis, only relevant content that was related to management of coastal and marine environments was extracted. Coded data were extracted from each of the plans using a manifest analysis, relying on the explicit mentioning of a term or concept.

Management plan analysis was done manually and without the use of computer assisted software. To do so, each of the management documents was converted to word processing format (docx), and passages of text were coded using the comment function in Microsoft Word (La Pelle, 2004; Knoch, 2018). The coded comments were then extracted using a macro extension and imported into Microsoft Excel. Following data extraction, the textual content was reorganized and categorized using a colour-coded methodology (Bree and Gallagher, 2016). The colour codes corresponded to the following themes of integrated management: spatial and temporal scales; human activities; single-species management; and ecosystem-level management. Once content from each of the plans was sorted into these themes, it was comparatively assessed via a semi-

[2] The full versions of some of the Integrated Fisheries Management Plans are available upon email request.

quantitative analysis. The analysis provided counts for each of the categories; for example, determining how many plans referenced management objectives related to shellfish aquaculture.

Table 2
Management plans selected for analysis (n=29).

PLAN TITLE	YEAR
Baynes Sound Coastal Plan for Shellfish Aquaculture	2002
Baynes Sound/Lambert Channel-Hornby Island Waters Important Bird Areas Conservation Plan	2001
Boyle Point Provincial Park Master Plan	1990
British Columbia and The Nature Trust Joint Conservation Land Management Program (West Coast)	2016
Comox Valley Regional Growth Strategy	2010
Comox Valley Sustainability Strategy	2010
Courtenay River Estuary Management Plan. Volume 1. Integrated Management Plan. Working Draft.	2001
Denman Island Official Community Plan	2008
Electoral Area 'H' Official Community Plan	2017
Fillongley, Tribune Bay, Helliwell and Sandy Island Provincial Parks Master Park Plan	1987
Growing Our Future Together – Regional District of Nanaimo Agriculture Area Plan	2012
Helliwell Provincial Park Ecosystem Based Plan	2001
Hornby Island Official Community Plan	2014
Integrated Fisheries Management Plan for Geoduck and Horse Clam (Pacific Region)	2019
Integrated Fisheries Management Plan for Intertidal Clams (Pacific Region)	2019
Integrated Fisheries Management Plan for Roe Herring (Pacific Region)	2017
Integrated Fisheries Management Plan for Salmon in Southern B.C	2018
Integrated Framework for Geoduck Management	2017
Islands Trust Conservancy Regional Conservation Plan 2018-2027	2018
K'ómoks First Nation Comprehensive Community Plan	2014
K'ómoks Marine Use Plan	2012
Management Plan for the Great Blue Heron fannini subspecies *(Ardea herodias fannini)* in Canada [Proposed]	2016
Management Plan for the Peregrine Falcon pealei subspecies *(Falco peregrinus pealei)* in Canada	2017
Management Plan for the Steller Sea Lion *(Eumetopias jubatus)* in Canada	2011
Puntledge River Watershed Action Plan	2017
Recovery Strategy for the Marbled Murrelet *(Brachyramphus marmoratus)* in Canada	2014
Regional Growth Strategy – Shaping our Future	2011
Rural Comox Valley Official Community Plan	2014
Shellfish Integrated Management of Aquaculture Plan	2017

3. MANAGEMENT SUMMARIES

There are many governing bodies in Baynes Sound/Lambert Channel (Table 3). Although each has a distinct management role, there are overlapping jurisdictional boundaries. For instance, the regional governments are responsible for land-use planning within their District area, up to the low-water mark on their coastlines, and the Islands Trust Conservancy has land-use planning authority in the Islands Trust Area (i.e. Denman and Hornby Islands). However, there is jurisdictional overlap in the marine waters of Baynes Sound/ Lambert Channel between the Islands Trust and regional, provincial, federal and First Nations governments.

The following section presents grouped management summaries, to provide regional context for each of the relevant agencies and management plans. Individual summaries for each of the management plans can be found in Appendix C.

Table 3
Governing bodies in Baynes Sound/ Lambert Channel.

AGENCIES	DESCRIPTION
Fisheries and Oceans Canada (DFO)	• The lead federal authority for managing fisheries and aquaculture in British Columbia. • DFO also manages specific species, habitats or ecosystems for freshwater fish and marine species.
Environment and Climate Change Canada (ECCC)	• Responsible for water quality monitoring and recommendations for shellfish advisories. • ECCC also manages specific species, habitats or ecosystems for migratory birds.
BC Ministry of Environment and Climate Change Strategy	• Responsible for the effective protection, management and conservation of British Columbia's air, land, water and living resources. • Responsible for managing specific species, habitats or ecosystems for freshwater fish and most terrestrial species.
BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development	• Responsible for managing Crown land, including the issuance of land tenures for aquaculture. • Responsible for managing and licensing the wild harvest and culture of aquatic plants.

AGENCIES	DESCRIPTION
BC Parks	• A division of the Ministry of Environment and Climate Change Strategy, BC parks is responsible for the designation, management and conservation of a system of ecological reserves, provincial parks, conservancies, protected areas and recreation areas located throughout British Columbia.
First Nations	• Several First Nations have traditional territory in Baynes Sound/ Lambert Channel, including K'ómoks, Qualicum, Tla'amin and Nanoose First Nations.
Comox Valley Regional District (CVRD)	• A regional District that encompasses the Village of Cumberland, the Town of Comox and the City of Courtenay, along with the electoral areas of Baynes Sound, Lazo North and Puntledge-Black Creek. • Carries out land-use planning in each of these areas (with the exception of Denman and Hornby Islands, which are under the jurisdiction of the Islands Trust).
Regional District of Nanaimo (RDN)	• A regional District that encompasses the City of Nanaimo, the City of Parksville, the Town of Qualicum Beach and the District of Lantzville, along with seven electoral areas. • Carries out land-use planning in each of these areas (with the exception of Gabriola, DeCourcy, Mudge Island, which are under the jurisdiction of the Islands Trust).
Islands Trust Conservancy	• A conservation land trust created to carry out the provincial mandate of the Islands Trust Act, which is to preserve and protect the Islands Trust Area and its unique amenities and environment. • Responsible for land-use planning in Islands Trust Area, which includes Denman and Hornby Islands.
The Trust Fund of British Columbia	• A land conservation organization, which frequently collaborates with other agencies and various levels of government to manage ecologically significant lands across British Columbia.

3.1. Fisheries Management

The *Fisheries Act* establishes DFO as the lead authority in managing all fisheries in Canada's ocean territory. Fisheries management is guided by the Sustainable Fisheries Framework. The framework is a guide to implementing an ecosystem approach to fisheries management. It also establishes a precautionary approach to management by providing tools to monitor and assess sustainable initiatives (DFO, n.d. a). Integrated Fisheries Management Plans (IFMPs) are the primary management tool through which the Sustainable Fisheries Framework policies are applied. IFMPs are used to guide the conservation and sustainable use of marine resources and to support the management of sustainable fisheries (DFO, n.d. b). The overarching purpose for each of the plans is to identify the main objectives and requirements for each fishery, as well as the management measures that will be used to achieve those objectives.

There are four relevant fisheries management strategies from DFO, which are included in this analysis: the IFMP for Roe Herring; the IFMP for Salmon in Southern British Columbia; the IFMP for Geoduck and Horse Clam; and IFMP for Intertidal Clams. With the exception of the IFMP for Salmon, each of the management plans encompasses fisheries across the Pacific Coast. The temporal

scope of the plans ranges from one to three years in duration. Each of the IFMPs follows a template, which includes an overview of the fishery, the stock assessment and status (describing ecosystem interactions, available information on precautionary approach references, and stock trends), management issues, short- and long-term fisheries objectives, management measures for the duration of the plan and a performance review of previous objectives (DFO, n.d. a).

3.2. Aquaculture Management

In 2010, DFO and the Province of British Columbia signed an Agreement on Aquaculture Management, which lays out the primary responsibilities of the federal and provincial governments related to the management of aquaculture (DFO, n.d. c). The agreement assigns DFO the role of the lead federal department for issuing licenses and regulating most aspects of marine finfish, shellfish and freshwater/land-based aquaculture operations in British Columbia. The Province of British Columbia is responsible for issuing tenures where operations take place, licensing marine plan cultivation, regulating the business aspects of aquaculture (e.g. workplace health and safety) and reporting on seafood exports (DFO, n.d. c).

Under the agreement, DFO is responsible for creating Integrated Management of Aquaculture Plans (IMAPs). Although DFO has released IMAPs for each sector of aquaculture (freshwater/land-based, marine finfish and shellfish aquaculture), only the Shellfish IMAP was included in this analysis because it is the dominant sector in Baynes Sound. As stated in the introduction, the planning area is the most important area in British Columbia for shellfish aquaculture (IBA Canada, n.d.). The purpose of the Shellfish IMAP is to identify the main objectives and requirements for the management of shellfish aquaculture in British Columbia, as well as the management measures used to meet these objectives.

To manage geoduck aquaculture in British Columbia, DFO created the Integrated Geoduck Management Framework (IGMF), which provides a harmonized framework to manage both wild and aquaculture geoduck fisheries. The IGMF provides siting guidelines for new shellfish aquaculture operations, to inform proponents about which criteria are likely to affect application approval. Given that Comox Bar remains an active geoduck fishery, the framework was also included in the analysis.

The Baynes Sound Coastal Plan for Shellfish Aquaculture (BSCPSA) is a collaborative effort led by the provincial government to guide the sustainable development and management of shellfish aquaculture in Baynes Sound (BCMSRM, 2002). It is multi-agency provincial project, guided by advice from DFO and the Canadian Wildlife Service. Created prior to the 2010 change in management responsibilities, the plan has not been updated to reflect the change in aquaculture authority. It is still listed on the provincial website as the management plan for Baynes Sound and so was included in this analysis.

3.3. Species Conservation

3.3.1. Bird Conservation

Baynes Sound/Lambert Channel is a significant area for several species of birds, including an exceptionally high concentration of waterbirds (IBA Canada, n.d.). This is principally due to the variety of different habitats within the region, including inshore and foreshore marshes, low gradient deltas and tidal flats, which provide different sources of food for birds (IBA Canada, n.d.). One of the most important sources of food is the high production of herring spawn that occurs throughout the region; upwards of 60,000 birds feed on adult herring and their eggs during peak season (IBA Canada, n.d.).

To focus conservation actions for this important ecosystem, Baynes Sound/Lambert Channel has been designated as an Important Bird Area (IBA). IBAs are sites that provide essential habitat for one or more species of breeding or non-breeding birds (Booth, 2001). Now known as the K'ómoks IBA, the site is an amalgamation of three formerly separate IBAs: the Comox Valley IBA, the Baynes Sound IBA and the Lambert Channel/Hornby Island Waters IBA. The three IBAs share common populations of waterbirds but were established separately because they were nominated for designation independently (IBA Canada, n.d.). The K'ómoks IBA is designated for four species at the global level (Trumpeter Swan, Harlequin Duck, Thayer's Gull, Glaucous-winged Gull); one species at the continental level (Mew Gull); and two species at the national level (Great Blue Heron and Peregrine Falcon) (IBA Canada, n.d.).

The management plan for this IBA, the Baynes Sound/Lambert Channel-Hornby Island Waters IBA Conservation Plan, was created in 2001 prior to the amalgamation and does not manage the additional area encompassed by the current K'ómoks IBA (Booth, 2001). The purpose of this plan is to highlight the wildlife values within the planning area, detail the key issues that may affect those values, and to direct future conservation activities to address these issues. Though the plan remains the most recent management document for the region, this analysis has been supplemented with relevant updated information from IBA Canada (IBA Canada, n.d.). Additional information regarding bird conservation management for at-risk birds is found in the Species-at-Risk section below.

3.3.2. Rockfish Conservation

There are three Rockfish Conservation Areas (RCAs) within Baynes Sound/Lambert Channel: Baynes Sound, Savoie Rocks-Maude Reef and Chrome. According to monitoring data, inshore rockfish populations are particularly low in the inshore waters of Vancouver Island (DFO, n.d. d). RCAs aim to reduce population decline by protecting rockfish from all forms of mortality associated with commercial and recreational fishing activities (DFO, n.d. d).

Fishing activities that are banned include commercial salmon fishing by seine or gillnet; commercial herring fishing by gillnet, seine and spawn-on-kelp; and recreational fishing of invertebrates by handpicking or diving (DFO, n.d. d).

3.3.3. Species at-Risk

The *Species at Risk Act* (SARA) requires the federal government to prepare recovery strategies and recovery actions plans for SARA-listed extirpated, endangered and threatened species within legislated timelines, and to prepare management plans for species of special concern (SARA, 2002). There are federal plans for several at-risk species that occur in Baynes Sound/Lambert Channel, including management plans for the Great Blue Heron, the Peregrine Falcon, and the Steller Sea Lion, and a recovery strategy for the Marbled Murrelet. Management plans provide an overview of the species, including status, distribution, key threats and needs, as well as management goals, objectives and actions. Recovery strategies assess the feasibility of recovery for at-risk species and identify critical habitat for species at risk.

The Government of British Columbia also collaborates with the federal government to management and/or recover species at risk, as mandated by the Accord for the Protection of Species at Risk in Canada (1996) and the Canada-British Columbia Agreement on Species at Risk (2005). The agreement established a framework within which both governments can exercise their respective powers in a coordinated and focused approach, to deliver species-at-risk legislation, policies and operational procedures (Government of British Columbia, n.d. a). For instance, the federal management plan for the Peregrine Falcon incorporates the entirety of the provincial management plan. Though there are stand-alone provincial plans for the Marbled Murrelet and the Western Screech Owl, these documents focus on terrestrial management actions and were therefore outside of the scope of this report.

The Identified Wildlife Management Strategy is another provincial species conservation initiative, undertaken by the Ministry of Environment and Climate Change Strategy in partnership with the Ministry of Forests and Range (British Columbia. Ministry of Environment and Climate Change Strategy, n.d.). The purpose of the strategy is to manage the habitats of species at risk in British Columbia, principally through the implementation of Wildlife Habitat Areas. There are species accounts under this strategy for wildlife present in Baynes Sound/Lambert Channel, including Great Blue Herons, Marbled Murrelets and Western Screech Owls. However, since efforts guided by the Identified Wildlife Management Strategy are focused on protecting terrestrial habitats from forest and range practices, these initiatives were not included in this report.

3.4. First Nations Resource Management

Baynes Sound/Lambert Channel lies within the shared traditional territory

of multiple First Nations, including K'ómoks, Qualicum, Tla'amin and Nanoose First Nations. However, only the K'ómoks First Nation has produced management plans for the marine region and therefore their role in governance is the focus of this report. In 2011, the K'ómoks Marine Use Plan was released, the purpose of which is to provide the overall strategic direction for acceptable marine uses and activities within the traditional territory of the K'ómoks First Nation.

The K'ómoks First Nation has also developed a Comprehensive Community Plan, which sets out a vision for the future of the community, addressing lands, governance, education, health, safety, environmental protection, cultural values and sustainability. Although much of the content is beyond the scope of this report, the Comprehensive Community Plan does include goals and objectives focused on preventing the negative impacts of human activities on K'ómoks First Nation's marine and terrestrial territory.

3.5. Land and Marine Use Planning

3.5.1. Coastal Planning

Baynes Sound/Lambert Channel straddles the boundaries of two Regional districts: the Comox Valley Regional District (CVRD) and the Regional District of Nanaimo (RDN). Both districts have produced land-use planning documents for their regions, including the provincially mandated Regional Growth Strategy (RGS), which aims to promote coordination among the municipalities and regional districts on issues that cross municipal boundaries. The other purpose of the RGS is to inform the provincial government of local priorities and objectives, so that it can align its own directives to support these priorities. The regional strategies provide an overview of land-use recommendations as well as an overarching direction to guide local-level planning documents, such as official community plans (OCPs).

OCPs are produced by regional governing authorities (the CVRD, the RDN and the Islands Trust Conservancy), and contain more detailed policies and a regulatory framework that define land-use permissions. Although the CVRD and the RDN have both produced agricultural plans, only the RDN Agricultural Area Plan (AAP) was included in this report because it jointly manages intertidal aquaculture operations alongside terrestrial aquaculture and explicitly considers farming impacts on the marine environment. The Comox Valley Agricultural Plan only addresses terrestrial agricultural and its impacts on ground water and surface waters.

3.5.2. Estuarine Planning

The K'ómoks Estuary (also known as the Courtenay River Estuary) is part of an extensive estuary ecosystem that extends from Comox Harbour through

Baynes Sound to Deep Bay and Mapleguard Point (IBA Canada, n.d.). K'ómoks Estuary is one of only eight Class 1 estuaries in Canada, the highest ranking of five Importance Classes (Ryder et al., 2007). K'ómoks Estuary is considered to be valuable based on its intertidal size, estuarine habitat, intertidal species, waterbird density and herring spawn (The Nature Trust, n.d.). Additionally, this estuary is known to support all five species of Pacific salmon during multiple life stages, as well as one of the largest populations of migratory birds within the Salish Sea (K'ómoks First Nation, 2014).

However, the K'ómoks Estuary is also jurisdictionally complex, which has hindered attempts to move forward with repeated collaborative management/ governance initiatives. The K'ómoks First Nation maintain their inherent rights to govern the waters, shores and uplands, and are in the process of negotiating the jurisdictional status of the estuary with the provincial and federal governments (Estuary Working Group (EWG), 2009). The settler populations around the estuary are governed by the Government of Canada, the Provincial Government, the CVRD, and the municipalities of Courtenay, Comox and Cumberland (EWG, 2009). All of these governments are responsible for managing human activity within and around the estuary, as well as conserving and restoring the natural ecosystem (EWG, 2009).

In 2000, the *Draft Courtenay River Estuary Management Plan* was produced for DFO (DFO, 2000). Under the *Oceans Act*, DFO is mandated to lead the development and management plans for all coastal and estuarine habitats. The purpose of the plan was to provide a framework for habitat restoration, economic development, protecting water quality and aquatic ecosystems. It was intended to be an integrated management guide and to provide a planning process for all users of the estuary. However, it was never adopted or implemented by any of the governments (EWG, 2009).

In 2009, the Estuary Working Group, a sub-committee of the Comox Valley Project Watershed Society, along with relevant governments and stakeholders, produced a vision document for the estuary called *Keeping It Living* (EWG, 2009). This document builds off the *Draft Courtenay River Estuary Management Plan*, but provides an updated vision and guiding principles for the estuary. Following the release of *Keeping It Living*, the CVRD took the lead in developing a new management plan in collaboration with local governments. Although the revised management plan is cited within multiple planning documents created by K'ómoks First Nation and the CVRD, it is still undergoing First Nations review and has yet to be publicly released (Project Watershed, n.d.).

The Fish and Wildlife Compensation Program (FWCP), a partnership between BC Hydro, the Provincial Government and DFO, has produced multiple planning documents to restore fish and wildlife resources in the Puntledge River Watershed that have been adversely affected by the development of hydroelectric facilities. *The Puntledge River Watershed - Watershed Plan*, released on 2011, details priority topic areas (Salmonids,

Riparian / Wetlands and Species of Interest) but does not specifically include estuarine management objectives. In 2017, the FWCP released the *Puntledge River Watershed Action Plan* (PRWAP), which includes threats and priority management actions for the estuary.

3.6. Land and Marine Conservation

3.6.1. Provincial Parks

Provincial parks are implemented and managed by the Province of British Columbia through BC Parks. The provincial department describes its mission as protecting representative species and natural places within the province's Protected Areas System for conservation, outdoor recreation, education and scientific study (BC Parks, n.d. a). There are a number of provincial parks located along the coastlines of the Denman and Hornby Islands. Boyle Point, Fillongley and Mount Geoffrey Escarpment Park are located on Denman Island, and Tribune Bay, Sandy Island and Helliwell Park are located on Hornby Island. Both Mount Geoffrey Escarpment and Helliwell Park contain nearshore components that are managed as marine protected areas, with the following commercial fishery closures that have been implemented by DFO under the *Fisheries Act*: anchovy, surf perch, pile perch, sea cucumber, octopus, scallop, squid, red urchin, Pacific oyster and green urchin (BC Parks, n.d. b).

Each of the parks are designated Class A, which means that they are managed for the preservation of their natural environment for the use and enjoyment of the public (BC Parks, n.d. c). The management plans detail zoning requirements for the marine and terrestrial components of the parks, which are designed to balance conservation and recreation. Only the management plan for Helliwell Park was specifically designed to be an ecosystem-based plan (Balke et al., 2001).

3.6.2. Land Trusts

The Islands Trust Conservancy

The Islands Trust Conservancy (formally the Islands Trust Fund) was established in 1990 by the Province of British Columbia. It is a conservation land trust created to carry out the provincial mandate of the *Islands Trust Act* (1974), which is to preserve and protect the *Islands Trust Area* and its unique amenities and environment (Islands Trust Conservancy, n.d.). The Trust Area encompasses the islands and waters between the mainland of British Columbia and Vancouver Island, within Canada's Salish Sea. The *Islands Trust Act* assigns the Islands Trust Conservancy, through local area committees, the same land-use planning authority as a regional district board under the *Local Government Act* (Hornby Island Local Trust Committee, 2014).

The Islands Trust Area within the Baynes Sound/Lambert Channel region includes Denman and Hornby Islands. The Islands Trust Conservancy Regional

Conservation Plan is a general planning document for marine and terrestrial ecosystems within Islands Trust Area (Islands Trust Conservancy, 2018). The most recent Regional Conservation Plan was released in 2018 and encompasses a ten-year period. The purpose of the plan is to describe current land status and land use, including key threats and priority conservation areas, and to set goals and area of focus for the next ten years. There are also OCPs in place for Denman and Hornby Islands, which contain broad goals and policies to guide land preservation and development (Denman Island Local Trust Committee, 2008; Hornby Island Local Trust Committee, 2014). These plans must be consistent with regional policies of the Comox Valley RGS as well as the Island Trusts Policy Statement. The Local Trust Committee is responsible for adopting and administering the OCPs.

The Nature Trust of British Columbia

The Nature Trust of British Columbia is a land conservation organization that is dedicated to conserving biodiversity through the acquisition and management of ecologically significant lands across British Columbia (The Nature Trust, n.d. a). Key to the success of the program is collaboration with other agencies and various levels of government; over half of the land parcels are leased to the Province of British Columbia for joint management with the Nature Trust and some are leased to local and federal governments (The Nature Trust, n.d. b).

On a three-year rotational basis, the Nature Trust submits a provincial application detailing its Joint Conservation Land Management Program, the most recent cycle encompassing 2016-2019. The management program includes all parcels of lands on the Pacific Coast that are owned by the Nature Trust and jointly managed with the Province of British Columbia. Relevant to the scope of this document area are the parcels included within the Baynes Sound Conservation Area and Courtenay Estuary Conservation Area. The application document includes conservation and management related goals and objectives for each conservation area, as well as short- and long-term performance indicators.


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4. RESULTS AND DISCUSSION

The following table provides an overview the management analysis, comparing the purpose of the plans, spatial and temporal scales, human activities, species-specific management objectives and ecosystem-level management objectives across each of the documents.

MANAGEMENT CATEGORY Aquaculture Management

Planning Document / Management Feature	Plan Purpose	Spatial Scale	Temporal Scale	Human Activity	Species-Specific Management	Ecosystem-Level Management
Baynes Sound Coastal Plan for Shellfish Aquaculture (BSCPSA)	*To provide guidance to regulatory agencies and proponents regarding the sustainable development and management of the Baynes Sound shellfish aquaculture industry.*	• The Coastal Plan area is located between Denman Island and Vancouver Island, and includes Comox Harbour. • It includes all near-shore waters, shoreline and intertidal areas within Baynes Sound and Comox Harbour to the high tide mark.	• Completed in 2002, to be reviewed every three years. • Intended to be useful for many years, but projected to evolve over time based on new information and results from implementation and effectiveness monitoring. • Five-year timeline for phased plan implementation (2002 to 2007).	• The management plan provides spatial management recommendations, in the form of the Management Areas, to guide the sustainable expansion of shellfish aquaculture.	• Areas deemed suitable for expanding shellfish aquaculture operations considered potential interactions with marine species, including species at risk and fisheries resources. • Impacts to waterbirds, herring, salmon, geoduck, seals, sea lions, eelgrass and kelp beds were all considered.	• To assess the suitability of areas for industrial expansion, the potential benefits and impacts of aquaculture to all near-shore waters, shoreline and intertidal ecosystems were measured via a compatibility analysis.
Shellfish IMAP	*To identify the main objectives and requirements for the management of shellfish aquaculture in British Columbia, as well as the management measures used to meet these objectives.*	• This plan was designed for the Pacific Coast and is "concerned with the cultivation of any shellfish within a marine environment, including the foreshore, intertidal, and deep water (suspended or on the ocean floor) areas".	• Completed in 2017, intended to remain in effect for an unspecified amount of time • Management priorities will be "revised over time as work is completed and based on new science, monitoring and engagement with various interests." • Shellfish licences are issued on a multi-year basis, most often for a period of nine years.	• The plan addresses all elements of aquaculture management, which can include the production or collection of seed, nursery rearing of juvenile shellfish, grow-out, harvesting, harvesting, transport and imports.	• The plan encompasses all cultivated species of shellfish within British Columbia, including oysters, clams, geoduck clams, mussels and scallops. • It also includes aspects related to the culture of molluscs, crustaceans, and echinoderms, but not algae or marine plants.	• New licence applications may be subject to a thorough review, which may include an assessment of fish habitat, fish resources, species at risk, ecosystem effects, fisheries, and First Nations use of land and resources for traditional purposes. • A key objective is to maintain healthy and productive aquatic ecosystems; a properly sited operation can significantly reduce impacts to fish and fish habitat.
Integrated Geoduck Management Framework (IGMF)	*To provide a harmonized framework to manage both wild and aquaculture geoduck fisheries.*	• Applications for geoduck aquaculture considered for all areas in the Pacific Coast. • The commercial fishery occurs coastwide within spatial units called Geoduck Management Areas (GMAs), designed to manage effort based on quotas. GMAs correspond with broader Pacific Fisheries Management Areas (PFMAs), which are used to manage all fisheries in the Pacific. • Baynes Sound/Lambert Channel is within GMA 14/ PFMA 14, in the Inside Waters (of Vancouver Island) management region.	• Completed in 2017, to be reviewed at least 10 years following implementation, subject to broader policy changes or management requirements. • -Though the schedule of GMA openings and closures may vary from year to year, the fishery is intended to provide a year-round supply of product to the market. • -There is a three-year licensing rotation period for the Total Allowable Catch for the fishery within most of the Inside Waters.	• This IGMF guides the management of wild and aquaculture geoduck commercial fisheries, and applies to applications for new and/or amended shellfish aquaculture licences, including geoduck hatcheries.	• Licence conditions for aquaculture operations are specific to the species being cultured and the type of operation.	• New licence applications will be subject to a joint review by applicable federal and provincial agencies. • The review will consider the application in the context of First Nations food, social and ceremonial fisheries, adjacent land use, impacts to all other fisheries and habitat (including proximity to eelgrass, SARA species, intertidal stream channels, and fish spawning areas), navigation, size of tenure, proximity to other tenures, shellfish contamination, transfer considerations, etc.

MANAGEMENT CATEGORY Fisheries Management

Planning Document / Management Feature	Plan Purpose	Spatial Scale	Temporal Scale	Human Activity	Species-Specific Management	Ecosystem-Level Management
Integrated Fisheries Management Plan (IFMP) for Geoduck and Horse Clam	*The overarching purpose for each of the IFMPs to is identify the main objectives and requirements for each fishery, as well as the management measures that will be used to achieve those objectives.*	• Manages the harvest of geoduck and horse clam throughout the Pacific Coast. • First Nations and recreational fishing may occur coastwide, however, openings are contingent upon in-season closures (due to parks, marine reserves, research, navigation, or sanitary and marine biotoxin contamination). • The commercial fishery also occurs coastwide within GMAs and is also subject to in-season closures. • There is an annual Horse Clam fishery in Comox Bar (GMA 14B03) that has been in operation since 2003. • Commercial harvest during 2019 to	• This IFMP covers the period from March 1, 2019, to February 28, 2020, and is renewed annually. • Open times in the fishery will be scheduled to prevent conflict with herring fisheries and herring spawning activity in the South Coast; GMA 14 is normally closed February 15 to April 15.	• This IFMP guides the management of First Nations, recreational and commercial Geoduck and Horse Clam fisheries. • The plan also discusses management of broodstock harvest for stock enhancement and aquaculture purposes.	• The management plan considers interactions between Sea Otters, a depleted species that preys on invertebrate species, and the Geoduck and Horse Clam Fishery. • Objectives to manage both includes the development of an EBM strategy that will allow a Geoduck fishery alongside the recovery of otter populations. Since the fishery is selective, there are no concerns for potential impacts on otters.	• This IFMP includes ecosystem objectives that harvest and culture activities operate in a manner that prevents impacts to eelgrass beds and other sensitive fish habitat. • Geoduck and Horse Clam populations tend to overlap with eelgrass beds, which provide critical habitat for many fish and invertebrate species. • No commercial harvesting can take place in eelgrass beds and harvesters are advised to avoid beds when anchoring or dragging air hoses.
IFMP for Salmon in Southern British Columbia		• Manages the harvest of salmon in tidal and non-tidal waters from Cape Caution south to the British Columbia/Washington border. • The commercial fishery is spatially managed through Pacific Salmon Fishing Areas (PSFA); Baynes Sound/ Lambert Channel is dually managed through Salmon Area D (gillnet) and Salmon Area B (seine). • There are beach boundaries (0-2.5 km) in effect within Area D to protect Coho and Chinook stock, as well as radius boundaries around Fillongley Creek and closures within Baynes Sound.	• This IFMP spans from June 1, 2018, to May 31, 2019, and is renewed annually. • There are temporal and spatial closures in place to protect stocks, which vary according to species and region. Within Baynes Sound/Lambert Channel, the gillnet fishery may be restricted to daylight hours if there are significant levels of non-target species catch.	• This IFMP guides the management of First Nations, recreational and commercial Salmon fisheries.	• Covers the management of Pacific salmon species, which include Sockeye, Coho, Pink, Chum and Chinook. • The plan also lists each of the SARA-listed and depleted species that may be encountered by salmon fisheries, including the Marbled Murrelet and the Steller Sea Lion. • The presence of sea lions in PFMA 14 has negatively impacted the fishery, reduced stream escapement and altered migration and holding behaviour. These impacts will be considered in future management of the fishery.	• DFO is shifting toward an integrated EBM approach to research and management. • Management of Pacific salmon will require linking variation in salmon production with changes in climate and their ecosystems. Since salmon are anadromous species, they are particularly sensitive to changes in both marine and freshwater systems. DFO conducts multiple programs to monitor and study environmental conditions.
IFMP for Herring		• Manages the harvest of herring throughout the Pacific Coast. First Nations and recreational fisheries occur coastwide, subject to appropriate licensing and area closures • The commercial fishery occurs coastwide within Major and Minor Stock Assessment Areas, as well as other management areas and subareas. • Baynes Sound/Lambert Channel is located within the Major Stock Assessment Area 14. • There is a permanent closure in Comox Harbour (Sub-Area 14-14).	• Encompasses the period of November 7, 2017, to November 6, 2018. • Although this IFMP is meant to be renewed annually, the 2017 report is the latest available on the federal website at the time of writing.	• This IFMP manages the First Nations and recreational harvest of herring, as well as four commercial herring fisheries: Roe Herring, Spawn on Kelp, Food and Bait Herring and Special Use Herring.	• The plan states that there may be interactions between the herring fishery and depleted species, such as the Steller Sea Lion, and other marine mammals and seabirds. DFO and the fishing industry collects information about these encounters.	• There is no information available on conservation limits for herring based on ecosystem considerations. • More research is needed to better understand the interplay of food supply and predation impacts on herring survival, as well as the role played in maintaining the integrity and functioning of the ecosystem. • DFO attempts to mitigate environmental impacts from gear types used in fishery; during the roe fishery, efforts are made to avoid impacts to sensitive spawning habitat, such as eelgrass beds.
IFMP for Intertidal Clams		• Manages the harvest of intertidal clams in the Pacific Region. • First Nation and recreational fisheries may occur year-round throughout the coast, subject to in-season closures (Parks, Marine Reserves, research, navigation, or sanitary and marine biotoxin contamination). • The commercial fishery is spatially managed through Clam Management Areas (CMAs); Baynes Sound/ Lambert Channel is located within CMA D. • The commercial fishery is also subject to closures. • There is no commercial fishery in Comox Harbour.	• This IFMP is in effect from January 1, 2019, to December 31, 2021, and renewed every three years. • Intertidal clams are harvested during low tide cycles by hand digging only. • CMA D is a summer fishery only, with an average of eight tides harvested annually. • The proposed opening for the commercial fishery in CMA D is from May through August, although specific openings will be subject to consultation with industry. • Openings are reliant on market conditions, water quality and weather.	• - This IFMP guides the management of First Nations, recreational and commercial intertidal clam fisheries. • - Aquaculture operations are managed independently of the fishery, although tenure holders may access wild stocks for broodstock purposes.	• Covers the management of four species of intertidal clam: Manila clam, native littleneck clam, butter clam and varnish (savoury) clam. • - Since clams are harvested by hand and rake digging, by-catch of non-target species can be easily sorted out and is not a concern.	• In relation to ecosystem interactions, the plan states that intertidal clams have a much lower mortality rate after they have settled on the ocean floor and found protective habitat. Once settled, dominant predators include crabs and sea stars and minor predators include molluscs, marine mammals and waterbirds.

MANAGEMENT CATEGORY First Nations Resource Management

Planning Document / Management Feature	Plan Purpose	Spatial Scale	Temporal Scale	Human Activity	Species-Specific Management	Ecosystem-Level Management
K'ómoks Marine Use Plan	*To provide the overall strategic direction for acceptable marine uses and activities within the traditional territory of the K'ómoks First Nation.*	• The plan encompasses the marine territory of the K'ómoks First Nation, covering 257,973 ha. • The plan identifies three regional planning units, which are further delineated into zones for specific management actions. • Most of Baynes Sound/Lambert Channel is designated as a Special Management Zone to protect K'ómoks economic interests. • The remaining areas (K'ómoks Estuary, Sandy Island and Helliwell Marine Park) are designated as Protection Zones for their cultural and ecological significance.	• Completed in 2012, the Marine Use Plan is intended to be updated and reviewed on a regular basis. • - Progress toward implementation of the plan is to be reviewed annually.	• Covers the following uses and activities in the marine environment: commercial aquaculture, fisheries, general commercial and industrial uses, public and institutional uses, recreation and tourism, research and education, energy and mining, transportation and waste disposal.	• Implementation priorities for the plan include researching butter clam biomass inventory on Sandy Island (Tree Island), as well as the impacts of seal predation on salmon species in the K'ómoks Estuary. • The culling of seals is a management provision intended to restore balance in the estuary, to reduce predator-prey and increase salmon migration.	• This plan is guided by the principles of EBM, although specific ecosystem-level management actions are not included. • - Sensitive marine areas and/or areas of high ecological value are selected for spatial protection.
K'ómoks Comprehensive Community Plan	*To set out a vision or future target elements of importance to a community, including lands, governance, education, health, safety, environmental protection, cultural values and sustainability.*	• Guides community planning within the terrestrial territory of the K'ómoks First Nation, spanning 813,605 ha. • Also includes objectives related to estuarine management and watercourse restoration activities.	• The plan encompasses the period of 2014 to 2024. • It is a "living" document that the staff, leadership and community will continue to work from.	• In relation to marine activities, the plan supports a moratorium on offshore oil and gas exploration, as well as a moratorium on tanker traffic in the Salish Sea. • Aims to prohibit the long-term accommodation of vessels in Comox Harbour.	• Supports the protection of any eagle, heron or osprey nesting trees within the plan area.	• N/A

MANAGEMENT CATEGORY Land and Marine Use Planning

Planning Document / Management Feature	Plan Purpose	Spatial Scale	Temporal Scale	Human Activity	Species-Specific Management	Ecosystem-Level Management
Comox Valley Regional Growth Strategy (RGS)	*To build consensus among local governments in the Comox Valley Regional District (CVRD) on issues that cross municipal boundaries, and to inform the provincial government of the local priorities and objectives so that it can align its own directives to support these priorities.*	• The CVRD covers an area of approximately 172,500 ha and encompasses the Village of Cumberland, the Town of Comox and the City of Courtenay, along with the electoral areas of Baynes Sound, Lazo North, and Puntledge-Black Creek. • The RGS pertains to all the land within the CVRD with the exception of Denman and Hornby Islands, as land use planning for these areas is carried out by the Islands Trust.	• Released in 2010, the RGS and the plan projections are until 2031. • The objectives in the plan are associated with phased targets: short-term (2015), medium-term (2020) and long-term (2030).	• Covers the following marine related activities: coastal development, recreation and tourism, aquaculture, terrestrial resource industries (e.g. forestry & agriculture, stormwater drainage management and local marine transportation.	• N/A	• According to the CVRD, environmental protection and enhancement requires a regional and coordinated approach that is based on the principles of connectivity, precaution and restoration. • One of the objectives for the RGS is to identify and map areas for conservation, to connect habitats as well as support biodiversity and precautionary development.
Comox Valley Sustainability Strategy	*To present ideas regarding how communities in the CVRD can become more sustainable. The Strategy is a tool for generating innovative actions, guiding future policy decisions, mobilizing community resources and inspiring collaboration.*	• The Sustainability Strategy applies to all communities within the CVRD area.	• Released in 2010, the Strategy outlines targets to achieve global and regional sustainability targets by the year 2050. • Regional targets are phased, encompassing short-, medium	• The Strategy covers the following marine related activities: coastal development, aquaculture, terrestrial resource industries (e.g. forestry & agriculture), stormwater drainage management and local marine transportation.	• N/A	• One of the objectives of the Strategy is to conserve and restore 100% of currently unprotected sensitive ecosystems, including the K'ómoks Estuary, by 2050.
Rural Comox Valley Official Community Plan (OCP)	*This OCP contains a set of policies that reflect the goals and objectives of rural residents of the Comox Valley, and provide direction about what types of future development are acceptable.*	• This OCP applies to all regions in the CVRD except lands within the municipal boundaries of Comox, Courtenay, and Cumberland, Denman and Hornby Islands, as well as lands within the jurisdiction of the K'ómoks First Nation. • Coastal areas extend from the natural boundary (high-water mark) to the 30 m bathymetric contour.	• Released in 2014, the plan adopted a 20-year time horizon to be consistent with the RGS and the Sustainability Strategy, and plan projections are until 2031. • OCPs are reviewed "regularly to respond to changing circumstances, and in response to new issues."	• The Rural Strategy covers the following marine related activities: coastal development, recreation and tourism, aquaculture, terrestrial resource industries (e.g. forestry & agriculture) and stormwater drainage management.	• Includes provisions to protect nesting bird species (specifically Great Blues Heron and Bald Eagles) beyond the minimum requirements of the *Wildlife Act*. • Also implements a boundary radius around nesting trees to prevent disturbance.	• One of the objectives of this OCP is to protect, restore and enhance sensitive coastal and marine ecosystems; including the K'ómoks Estuary. • Coastal areas are designated as Aquatic and Riparian Habitat Development Permit Area, to protect the natural environment, its ecosystems and biological diversity, as well as to protect development from hazardous conditions.

MANAGEMENT CATEGORY Land and Marine Use Planning, cont.

Planning Document / Management Feature	Plan Purpose	Spatial Scale	Temporal Scale	Human Activity	Species-Specific Management	Ecosystem-Level Management
Regional District of Nanaimo (RDN) – RGS	*To establish a consistent and coordinated management approach from local governments throughout the RDN to foster socially, economically and environmentally sustainable communities.*	• This RGS includes all areas of the RDN. • The RDN encompasses an area of approximately 207,000 ha and is comprised of seven electoral areas and the following four municipalities: the City of Nanaimo, the City of Parksville, the Town of Qualicum Beach and the District of Lantzville.	• This RGS was released in November 2011. • The strategy takes a long-term perspective, forecasting 30 years, but its key policies are to be monitored, assessed and reviewed once every five years.	• The following marine related activities are covered in the RGS: coastal development, recreation and tourism, aquaculture, terrestrial resource industries (e.g. forestry & agriculture) and stormwater drainage management.	• N/A	• Includes supporting policies to achieve the objective of protecting and enhancing the environment, and minimizing damage related to development.
RDN Agricultural Area Plan (AAP)	*The purpose of this plan is to address barriers and challenges facing the agricultural community.* *Plan goals are derived from the policy direction of the RDN RGS.*	• The APP applies to agriculture and shellfish aquaculture operations within the NDR. The majority of aquaculture operations are located in the Nanoose Bay and Qualicum areas.	• Completed in 2012, it forecasts goals for the next 20 to 30 years. • Recommended actions are phased, according to the following time frames: short-term (1 to 3 years); medium-term (3 to 5 years); long-term (5 to 10 years); and ongoing with no planned date of completion. • To be reviewed every two years, potentially extending to four after the short-term goals are completed.	• The plan guides both agricultural and aquaculture within the RDN, and addresses the potential sources of conflict between these activities (e.g. issues of water use and run-off). • The plan also supports tourism activities.	• N/A	• N/A
RDN Electoral Area 'H' OCP	*To provide a set of objectives and policies that reflect community values for managing existing and future uses of land, coastal areas and the surface of the water within the plan area.*	• Plan applies to Electoral Area 'H' within the RDN, which borders the southern boundary of the CVRD. • The plan area covers approximately 28,615 ha of land and includes the neighbourhoods of Deep Bay, Bowser, Qualicum Bay, Qualicum First Nation Reserve, Dunsmuir, Shaw Hill/Baylis Area, Spider Lake and Horne Lake. • Marine waters in plan area are also within the Islands Trust Area.	• This OCP was completed in 2017 and provides direction for the following 10 to 30 years. • Implementation actions are phased, according to the following time frames: immediate (within 1 year); short-term (within 5 years); long-term (20 to 25 years); and ongoing with no planned date of completion. • To be reviewed as necessary.	• The following marine related activities are covered in this plan: coastal development, recreation and tourism, aquaculture, terrestrial resource industries (e.g. forestry & agriculture), local marine transportation and stormwater drainage management.	• Includes provisions to protect nesting bird species (specifically Great Blue Herons and Bald Eagles) beyond the minimum requirements of the *Wildlife Act*. • Also implements a boundary radius around nesting trees (considered to be sensitive ecosystems) to prevent disturbance.	• One of the objectives for the marine shores and nearshore waters is to protect the natural environment and natural coastal processes. • The Marine Coast Development Permit Area applies to all lands 30 m seaward of the natural boundary and 12 m landward, to protect the natural environment, its ecosystems and biological diversity, as well as to protect development from hazardous conditions.
Draft Courtenay River Estuary Management Plan	*To provide a framework for habitat restoration, economic development, protecting water quality and aquatic ecosystems.* *Also intended to guide integrated management and provide a planning process for all of those using the estuary.*	• Covers the entirety of the estuary as defined by the 200-year floodplain; approximately 1,566 ha of water and 604 ha of land. • Surrounding the estuary are lands currently within CVRD, including the City of Courtenay and the Town of Comox, and K'ómoks First Nation reserves.	• Completed in 2000, but the co-operative agreement was not signed and the plan never adopted or implemented. • The plan was to be periodically reviewed, and comprehensively reviewed within five years.	• Action programs outlined in the draft plan were designed to manage the following human activities: industrial and urban development, log storage and handling, marine navigation and dredging, recreation and water quality management.	• N/A	• The plan envisions a natural and productive estuary for plants, fish, wildlife and people. • Outlines action programs to manage plant, fish and wildlife habitats, including: the development of a habitat classification and development model, maintaining and restoring the capacity of the estuary to support wildlife, and protecting habitats with high ecological values.
Puntledge River Watershed Action Plan (PRWAP)	*Specifies actions that will conserve, restore and enhance fish and wildlife species and their habitats.*	• Encompasses the Puntledge River Watershed region, spanning 5,9827 ha and including the Puntledge River basin on the eastern side of the Vancouver Island Mountain Range. • The adjoining head waters from Cruikshank River flow into Comox Lake, which drains into the Puntledge River and join the Tsolum River, flowing into the Courtenay River prior to flowing into the K'ómoks Estuary.	• Completed in 2017, and encompasses a five-year planning period.	• BC Hydro has made operational changes in its use of water to improve habitat conditions and migrations opportunities for fish. • Includes priority actions related to research and information acquisition, land securement and monitoring and evaluation.	• Includes strategies to increase the population viability of Anadromous salmon (Chinook, Chum, Pink, Coho, Sockeye); Steelhead; sea-run Cutthroat Trout; and Resident salmonids (Rainbow, Cutthroat and Kokanee). • Research objective to better understand the impacts of seals and sea lion predation on salmon. • Aims to implement priority species- and habitat-related conservation actions in recovery strategies and management plans for at-risk plant and wildlife species that are known to be in the watershed.	• Includes habitat-based priority actions; including actions to conserve or enhance important habitats or mitigate habitat threats for priority bird species – refers to K'ómoks IBA. • One of main objectives for the rivers, lakes and reservoirs components of the Puntledge River Watershed is to ensure a productive and diverse aquatic ecosystem – efforts will aim to aid multiple species.

MANAGEMENT CATEGORY Land and Marine Conservation

Planning Document / Management Feature	Plan Purpose	Spatial Scale	Temporal Scale	Human Activity	Species-Specific Management	Ecosystem-Level Management
Boyle Point, Helliwell, Mount Geoffrey Escarpment[4], Fillongley, Tribune Bay and Sandy Island Parks	*The plans give broad, long-term direction to the management of the provincial parks located on the coasts of Denman and Hornby Islands.* *Their purpose is to guide the development and management of the parks, for dual conservation and recreational purposes.*	• The plans manage activities and land-uses within the boundaries of the provincial parks, including foreshore and marine components.	• The master plan for Helliwell, Fillongley, Tribune Bay and Sandy Island Parks was completed in 1987. • The master plan for Boyle Point Park was released in 1990. • Helliwell Park received an EBM plan in 2001 following the marine expansion. • Each of the plans provide long-term direction for each of the parks.	• The plans mainly include management provisions for tourism and recreation.	• Management actions include monitoring at-risk species.	• There are ecosystem restoration objectives in each of the plans. • The plan for Helliwell Park includes recommendations for DFO to management marine wildlife, including the creation of no-take zones for resident species and herring spawn.
Islands Trust Conservancy - Regional Conservation Plan	*To focus Islands Trust resources on areas with the highest biodiversity values and greatest need for conservation. Provides information related to marine and terrestrial ecosystems, including key threats, within Islands Trust Area.*	• The plan covers the entire Islands Trust Area, approximately 79,000 ha of land and 482,500 ha of water on the south coast of British Columbia. Within the scope of this documents, Islands Trust Lands include Denman Island and Hornby Island.	• The plan was adopted in 2018 and encompasses a ten-year period. • The plan is to be evaluated and adapted in the years 2021 and 2024, and the next plan will be developed in 2027.	• N/A	• For each of the Islands Trust Areas, the plan identifies resident SARA-listed species.	• Prioritized protection of nearshore eelgrass beds; both Denman and Hornby Islands have over 30% of their eelgrass shorelines protected. • Linked to prioritized protection of forage fish, which are a food source for a variety of marine predators.
Denman Island OCP	*To provide a framework that will guide future development and conservation initiatives.* *The plan must be consistent with the object of the Islands Trust.*	• Encompasses the Denman Island Local Trust Area, spanning approximately 5,151 ha and including Denman Island, Sandy Island, Chrome Island, Seal Islets and unnamed islets within 1 km of the shoreline of Denman Island and Sandy Island. • Water designation includes all of the marine areas within the Denman Island Area, as far west as the 30 m bathymetric contour off the shore of Vancouver Island.	• Adopted in 2008 for an unspecified timeframe. • The plan must be reviewed in its entirety at least once every five years.	• The plan covers the following marine related uses/activities: coastal development, aquaculture, terrestrial resource industries (e.g. forestry & agriculture), tourism and recreation, management of land-sourced pollution and local marine transport (BC Ferries).	• One of the objectives for Denman Island's marine environment is to protect the undisturbed areas around the foreshore and surrounding waters, to preserve areas where herring spawn as well as important seaduck foraging areas (e.g. eelgrass beds).	• The highest priority is to identify, preserve and protect the integrity of the natural ecosystems on Denman Island and the adjacent islets including the foreshore and intertidal areas. • Includes Development Permits for the protection of the natural environment, ecosystems and biodiversity, and promotion of water conservation.
Hornby Island OCP	*To provide an overview of local government goals, objectives and policies regarding the existing and proposed land use and development.* *The plan must be consistent with the object of the Islands Trust.*	• Encompasses the Hornby Island Local Trust Area, spanning approximately 2,981 ha including Hornby Island, Toby Island, Flora Islet, Norris Rocks, and unnamed islets within 1 km of the shoreline. • Water designation includes all of the marine areas in the Hornby Area, except where it overlaps with Denman Area, when the boundary becomes a line mid-channel.	• Adopted in 2014 for an unspecified timeframe; however, the land use policies are described as being long-range. • The plan must be reviewed in its entirety at least once every five years.	• The plan covers the following marine related activities: coastal development, aquaculture, terrestrial resource industries (e.g. forestry & agriculture), tourism and recreation, management of land-sourced pollution and local marine transport (BC Ferries).	• Details SARA-listed species that are found within the Hornby Local Trust Area, including the Peregrine Falcon and the Great Blue Heron. • Policy to protect areas along the coastline that provide nesting, feeding and resting for birds. • Recommends sign-posting, significant building setbacks and required retention of vegetation.	• Includes Development Permits for the protection of the natural environment, ecosystems and biodiversity, and promotion of water conservation. .
British Columbia and the Nature Trust Joint Conservation Land Management Program	*The Nature Trust is dedicated to conserving biodiversity through the acquisition and management of ecologically significant lands across British Columbia.*	• The management program includes all parcels of lands on the Pacific Coast that are owned by The Nature Trust and jointly managed with the Province of British Columbia. • Relevant to the scope of this document area are the parcels included within the Baynes Sound Conservation Area and Courtenay Estuary Conservation Areas.	• The management program extends from 2016 to 2019. • There are short- and long-term performance indicators, although the length of time is unspecified.	• Activities recommended for both Conservation Areas includes funding research to determine baseline species and ecosystem data, habitat restoration and preservation, and ecological monitoring. • The Courtenay Estuary Area includes provisions related to sustainable agriculture practices to maximize	• N/A	• Both conservation areas include objectives to maintain and improve existing habitat bases to support viable and productive populations of fish, wildlife and plants, including invertebrates. • The Courtenay Estuary Conservation Area includes objectives to provide wintering waterfowl habitat and to maximize agricultural foraging opportunities.

[4] A management plan for Mount Geoffrey Escarpment Park is currently under development and is in the final stage of BC Parks and First Nations Review. Retrieved from https://www.comoxvalleyrd.ca/projects-initiatives/past-current-projects/mt-geoffrey-park-plan

MANAGEMENT CATEGORY Species Conservation

Planning Document / Management Feature	Plan Purpose	Spatial Scale	Temporal Scale	Human Activity	Species-Specific Management	Ecosystem-Level Management
K'ómoks IBA: Baynes Sound/ Lambert Channel IBA Conservation Plan	*To describe wildlife values in the IBA area, discuss the issues that may affect these values, introduce and highlight the initiatives that are addressing some of these issues, and to focus and direct future initiatives that could further address identified concerns.*	• The K'ómoks IBA spans 56,073 ha and is located on the east-central coast of Vancouver Island, covering the estuaries and inland both north and south of the city of Courtenay.	• The IBA Conservation Plan was released in 2001 for an unspecified time period.	• Describes programs in place that are dedicated to improving water quality (managing septic systems, boater waste and hazardous waste disposal) and connecting shellfish aquaculture operations to bird conservation.	• Provides species accounts for the following bird species: Pacific Loon, Western Grebe, Pelagic Cormorant, Surf Scoter and White-winger Scoter, Harlequin Duck, Great Blue Heron, Trumpeter Swan, Bald Eagle, Black Turnstone, Brant, Mew Gull, Thayer's Gull and Glaucous-winged Gull.	• Improving water quality is a key component of the plan, to improve marine ecosystems. .
SARA Management Plans and Recovery Strategies	*Recovery strategies assess the feasibility of recovery for at-risk species and identify critical habitat for species at risk.* *Management plans detail species information, including status, distribution, key threats and needs, as well as management goals, objectives and actions.*	• Recovery strategies apply to species across Canada that are extirpated, endangered and threatened, and management plans apply to species of special concern.	• The documents for the Steller Sea Lion, the Marbled Murrelet, the Great Blue Heron and the Peregrine Falcon were released in 2011, 2014, 2016 and 2017, respectively. • Each of the plans have phased implementation actions (except the Peregrine Falcon).	• N/A	• The plans guide management actions for the following species: the Steller Sea Lion, the Marbled Murrelet, the Great Blue Heron (*fannini* subspecies), and the Peregrine Falcon (*pealei* subspecies).	• Involves objectives related to conserving and restoring marine foraging habitat, as well as implementing Wildlife Habitat Areas and Wildlife Management Areas where feasible and appropriate.

4.1. Discussion of Results

An integrated ecosystem-based approach to management would involve consistency in spatial and temporal scales, coordination in management of species and human activity, and would consider ecosystem-level interactions. The review and analysis of the plans for Baynes Sound/Lambert Channel indicate that they have all been developed independently, and therefore without the expectation of consistency and coordination.

There is a high degree of spatial overlap among the jurisdiction of the governing authorities, particularly in the intertidal and nearshore areas. Temporal planning is coordinated among planning documents produced by the regional districts, which forecast long-term planning perspectives. However, temporal planning among other governments and between agencies varies greatly, with dissimilar short-, mid- and long-term management objectives. There is some degree of overlap in the management of human activities, but there are also clearly designated roles. Many plans include complementary policies that support the management and development of intertidal aquaculture in Baynes Sound, as well as include traditional use of the area and its resources by First Nations. The vast majority of plans incorporate elements of EBM. This is most often iterated through spatial conservation objectives, aimed at conserving and restoring environmentally sensitive areas to support various populations of plants, fish and wildlife. In the following section, these findings are discussed in further detail. See Appendix D for a full breakdown of results.

4.1.1. Spatial Scale

There is a high degree of overlap in the spatial boundaries of the planning areas and multiple agencies are concurrently managing the same space (within their own jurisdictional authorities). Of the 29 plans analysed, 23 were created to directly manage marine use and human activities within Baynes Sound/ Lambert Channel. The exceptions include the federal species management plans, which have a broader and less specified spatial scope, as well as the Geoduck Management Framework and the Shellfish IMAP. Though the Shellfish IMAP references Baynes Sound as a region of importance for the industry, supporting a high concentration of shellfish aquaculture, it does not directly manage this area. This is in contrast to the IFMPs, which are intended to direct spatially-based fishing efforts throughout the coast. Four common spatial elements are discussed in this section, namely the intertidal zone, nearshore areas, estuarine areas, and terrestrial or shoreline areas. Table 5 shows a summary of the number of plans with these common elements.

Table 5.
Common spatial elements among management plans

Spatial Planning Element	Plans (n=29)
Intertidal zone	22
Nearshore	19
Terrestrial/shoreline	13
Estuarine	9

Intertidal

Of the 29 plans analyzed, 22 include management objectives related to the intertidal area, the area between the low- and high-water mark. Intertidal objectives were most often associated with shellfish aquaculture operations on Baynes Sound, and plans were both supportive of the industry (e.g. plans produced by the K'ómoks First Nation and the two regional governments) and aware of the need to ensure good management practices to mitigate environmental impacts (e.g. the BSCPSA and the IBA Conservation Plan). Each of the plans with intertidal management objectives also support tourism and recreational use within this region.

Nearshore

Approximately two-thirds of the plans analyzed (19 in total) encompass the nearshore area of Baynes Sound/Lambert Channel, beyond the intertidal zone. There are multiple governments and agencies managing different aspects of this area, with overlapping jurisdiction. For instance, the CVRD and the RDN have jurisdiction over land-use planning for coastal areas within their respective boundaries, which extends 30 m from the natural boundary (high-water mark). Additionally, the Islands Trust has jurisdiction of the marine waters surrounding Denman and Hornby Islands, extending 1 km from the shorelines and as far west as the natural boundary on the eastern coast of Vancouver Island. The Islands Trust and the CVRD have overlapping jurisdiction of ocean area between the natural boundary and the 30 m bathymetric contour line on the eastern coast of Vancouver Island. However, the CVRD respects the mandate of the Islands Trust for all development considerations in this region, and management is supported by a protocol agreement between the Islands Trust and the CVRD[3]. Like most of the Islands Trust Areas, this coastal buffer is principally managed to support conservation, as well as sustainable economic and recreational use.

In the *K'ómoks Marine Use Plan*, the Nation has designated most of the nearshore region as a Special Management Zone, with restricted industrial, commercial and industrial uses. The K'ómoks IBA supports conservation efforts in this region, to protect prey and foraging habitat for bird populations. The federal government is responsible for managing specific species, habitats or ecosystems in marine waters; DFO manages fishing effort throughout the Strait of Georgia and has implemented three RCAs in Baynes Sound/Lambert Channel.

[3] The protocol agreement commits both parties to promote a spirit of partnership through joint legislative, policy, program and communication initiatives. The agreement can be accessed from: http://www.islandstrust.bc.ca/media/343368/01orgagrsep082011comox.pdf

The marine component of Helliwell Provincial Park extends beyond the intertidal zone; however, provincial parks are limited in their ability to manage marine areas. Though provincial jurisdiction encompasses the seabed of the Strait of Georgia, fisheries closures must be implemented by DFO under the *Fisheries Act*. The K'ómoks First Nation intends for Helliwell Park to eventually become a Tribal Marine Park, as stated in the *K'ómoks Marine Use Plan*.

There are opportunities to improve integrated management throughout the nearshore waters, as many of the plans share similar objectives that are generally complementary. For instance, it may be useful to develop partnerships for management of the K'ómoks IBA. Provincial governments could be working with Denman Island Local Trust Committee and Hornby Island Local Trust Committee, as well as IBA Canada partners to protect sensitive marine territory in the nearshore waters surrounding the islands. Priority conservation areas include eelgrass beds[5] and critical herring spawn areas[6], which frequently overlap and have been already been mapped out. The *IBA Conservation Plan* states that these regions should be prioritized for spatial protection. Enacting more provincial marine protected areas would fulfil the objectives of the IBA and at-risk species management plans, by conserving marine bird foraging and overwintering habitat.

Terrestrial/Shoreline

Of the 29 planning documents, 13 were predominantly land-use planning documents for the terrestrial regions adjacent to Baynes Sound/Lambert Channel. However, each of these plans also encompasses shoreline and coastal marine environments. There is no spatial overlap between the plans produced by each of the regional districts, which have defined boundaries. Each of the regional planning documents produced by the CVRD and the RDN primarily deal with landward activities, but include targets and objectives related to the protection of sensitive coastal environments and shellfish aquaculture operations. The OCPs produced by the regional governments complement the overarching objectives of the district plans and provide a more detailed guide to coastal and intertidal management. Land-use planning for Denman and Hornby Islands falls under the jurisdiction of the Islands Trust. The Islands Trust has created OCPs for both islands, which include the nearshore areas.

There is spatial overlap for land-use planning on Vancouver Island and Denman and Hornby Islands, between First Nations and the municipal governments, and the Islands Trust Conservancy. The boundaries of the Comox Valley lie entirely within the traditional territory of the K'ómoks First Nation. The K'ómoks First Nation has not yet produced a land-use plan[7], however, there is already some

[5] Islands Trust eelgrass maps can be viewed from: http://www.islandstrustconservancy.ca/initiatives/marineconservation/eelgrass-mapping/
[6] Baynes Sound herring spawning records can be viewed from: http://www.pac.dfo-mpo.gc.ca/science/species-especes/pelagic-pelagique/herring-hareng/herspawn/142fig-eng.html
[7] At the time of writing, the K'ómoks First Nation website states that a land-use plan for area within its territory is upcoming: https://www.komoks.ca/land-use-plan

inherent compatibility between these governments for management of Baynes Sound/Lambert Channel shoreline area. The CVRD supports the K'ómoks First Nation's interest in expanding shellfish aquaculture and developing other economic opportunities, and each of the OCPs include policies for protecting environmental areas and limiting development along the shoreline (CVRD, 2010b). As detailed in the *K'ómoks Marine Use Plan*, the Nation is also in favour of restricting extensive shoreline development (K'ómoks First Nation, 2012). From all perspectives, reducing shoreline development would help maintain water quality and protect intertidal aquaculture operations.

Lastly, the spatial scope for the federal species management and recovery plans are broader and specific to the species in questions. The plans apply to populations distributed throughout the pacific coast, but each of the plans include management actions that apply to both terrestrial and marine habitats. Though many of the planning documents reference the presence of species at-risk in Baynes Sound/Lambert Channel, there are opportunities to better integrate habitat management recommendations made in species management plans. For instance, the management plan for the Peregrine Falcon includes an objective to expand protection for marine bird colonies that are preyed upon by falcons, including their ocean habitats. This objective aligns with the goals of the K'ómoks IBA.

Estuarine

More than one-third of the planning documents (nine in total) referenced the need to effectively conserve and restore the K'ómoks Estuary. The estuary falls under the overlapping jurisdiction of the municipal, provincial, federal and First Nations governments. Currently, there is no management plan in place for the K'ómoks Estuary. The report produced by the Estuary Working Group is still the most recent document to guide management planning for the estuary. According to Project Watershed, there was a draft K'ómoks Estuary Management Plan ready for adoption in 2012, however it is still undergoing First Nations review (Project Watershed, n.d.).

4.1.2. Temporal Scale

There is not a consistent temporal scale for planning and management in the Baynes Sound/Lambert Channel marine area. The plans were published at different periods over the past 20 years (excepting two management plans for provincial parks), though it is clear that some were developed together or served as a foundation for later plans. For instance, the *Comox Valley RGS* and the *Sustainability Strategy* were each published in 2011, both of which guided the development of the Rural Comox Valley OCP in 2014. A summary of the common temporal elements is found in Table 6.

Table 6.
Common temporal elements among management plans

Temporal Planning Element	Plans (n=29)
Reviewed or revised regularly	17
Indefinite time scale	15
Definite time scale	14
Include phased targets	9

Of the 29 planning documents, 15 have been implemented for an indefinite period of time. Additionally, 17 plans are meant to be reviewed and potentially revised following implementation, either according to a schedule (e.g. every five years) or as needed/required as new information becomes available (including 11 of the 15 with an indefinite time scale). Regardless of their intended revision schedule however, it is clear that some of the plans are now defunct and should be replaced. For instance, the BSCPSA was released in 2002 and intended to remain useful for many years. Although the governments adopted the plan, it was never formally implemented. Nearly 20 years later, there is now little growth left for the expansion of the industry in Baynes Sound (CVRD, 2010a). Furthermore, the role of provincial government in managing aquaculture has changed with the Agreement on Aquaculture Management. A new plan is required to reflect these changes. The *Baynes Sound/Lambert Channel IBA Conservation Plan* is another example of an outdated plan; though it was developed for an unspecified timescale, it has yet to be modernized following the amalgamation of the three sites in 2013.

Other plans are more ambiguous about their intended management period. For instance, the management plans for the provincial parks do not encompass a definitive timescale and are not subject to periodic revision. The master plan for Fillongley, Tribune Bay, Helliwell, Sandy Island Parks was produced in 1987 and remains the latest available plan on the provincial website for three of the parks (Helliwell Park received an updated ecosystem-based plan in 2001).

Of the 14 remaining plans with definitive timelines, most are still within the management timeframes for which they were intended; only the 2017-2018 IFMP for Pacific Herring is definitively outdated. Though a draft version of the 2018-2019 IFMP for Pacific Herring has been circulated for comment[8], at the time of writing it had not yet been posted on the federal website. These plans range from immediate implementation (e.g. the IFMP for Pacific Herring was to be implemented within one year of initial adoption) to long-term implementation (e.g. the plan projection in the Rural Comox Valley OCP are until 2031). Each of the documents produced by the regional Districts are coordinated to forecast long-term planning (i.e. more than 20 years in the future).

Nine of the plans contain phased targets to measure progress toward objectives, encompassing various short-, medium- and long-term time periods. Due to the inconsistency in specific time measurements, these timelines are not coordinated across sectors.

[8] The 2018-2019 IFMP for Pacific Herring is available from Pacific Wild: https://pacificwild.org/sites/default/files/RS3%20Draft%202018-19%20Pacific%20Herring%20IFMP.pdf

4.1.3. Management of Human Activity

There is some degree of overlap in management of human activities in Baynes Sound/Lambert Channel, but there are also clearly designated roles. Management of fisheries activities was found to have the least amount of crossover; DFO is the lead federal authority for managing commercial, First Nations and recreational fisheries. Additionally, K'ómoks First Nation states its intention to manage its own resources in the Marine Use Plan, and have developed a zoning guide to manage use in the marine area. A summary of common human activity elements is found in Table 7. Four elements are discussed in more detail in this section, namely shellfish aquaculture, water quality, marine tourism and recreation, and traditional use.

Table 7. Common human activity elements among management plans

Human Activity Planning Element	Plans (n=29)
Traditional use	16
Shellfish aquaculture	12
Coastal and marine tourism and recreation	12
Water quality	11
Terrestrial resource management (forestry, mining, agriculture)	11
Coastal industrial and urban development	8
Marine transportation	8
Fisheries	6

Traditional use of the area and its resources by First Nations was the most common human activity element among the plans, with more than half of the plans (16 of 29) including reference to traditional use. Traditional use was found among all the fisheries-related plans, but was also included in some community plans (from both First Nations and non-First Nations communities). In general, the plans that included this element recognized the importance of traditional use and endeavoured to include considerations and efforts to ensure its continuation into the future. Traditional wild harvest was most commonly referenced (e.g. shellfish, roe on kelp), but some plans also referred to non-harvest traditional uses (e.g. sites of cultural or spiritual significance). In general, plans that focused on birds did not include a traditional use element, nor did provincial park management plans or species recovery plans, with two exceptions (namely, the Helliwell Provincial Park Ecosystem Based Plan and Steller Sea Lion recovery plan, respectively).

Supporting aquaculture operations is a key aspect in many of the plans. Of the 29 planning documents, 12 include policies or objectives to support shellfish aquaculture operations in Baynes Sound. However, the planning documents do not directly manage operations. Regulation of aquaculture operations in British Columbia currently falls under the shared jurisdiction of provincial and federal governments. Aquaculture proponents submit land tenure applications to the British Columbia Ministry of Forests, Lands and Natural Resource

Operations and Rural Development, while DFO is responsible for issuing aquaculture licences, and monitoring compliance with and enforcing the conditions of the licence (Government of British Columbia, n.d. b). Transport Canada reviews the placement of aquaculture structures located within navigable waters, and the British Columbia Ministry of Agriculture issues licences for associated activities in the seafood industry (e.g. receiving and processing fish; Government of British Columbia, n.d. b). The BSCPSA served as a guide for provincial departments to assess potential feasibility of site applications but is now an outdated tool for Baynes Sound.

The land-use planning documents included policies that would indirectly benefit the aquaculture industry. For instance, each of the regional governments have created policies related to the management of stormwater, to ensure that it is properly cleansed before entering the marine environment to protect shellfish stocks in Baynes Sound. Water quality management as a broader category, including landward pollution and discharge from boats, is mentioned in 11 of the 29 plans. Though the AAP produced for the RDN manages shellfish aquaculture, its counterpart for the CVRD neither includes aquaculture nor considers the potential impacts of agricultural activities on marine ecosystems.

The K'ómoks First Nation owns Pentlatch Seafoods Ltd., a shellfish aquaculture company with seven intertidal tenures (occupying a total of 64.3 ha) located within the Baynes Sound, Royston and Comox Harbour regions. The K'ómoks First Nation aims to expand their aquaculture activity but currently there is no space for them to do so. Therefore, one of the management provisions in the *K'ómoks Marine Use Plan* for the estuary is that the Nation retains the right of refusal to renew any expired tenure licences.

Supporting coastal and marine tourism and recreational use were also frequently mentioned, appearing in 12 of the planning documents. There was little conflict in these objectives; each of the agencies were in support of sustainably developing tourism in Baynes Sound/Lambert Channel. The management plans for the provincial parks were principally designed to maintain tourism and recreational activities in a balance with the conservation of nature. The species management plans do not seek to directly manage human activity, though they contain objectives to protect species habitats that may be affected by human activities.

Currently, there are no management plans in place to addresses the harvest of beach-cast seaweed. Seaweed harvesting is a relatively new industry, and the pilot project occurring in the Baynes Sound region began after the majority of land-use plans were created. Though the red algae grow in subtidal waters, detached seaweed is harvested on the beach. Currently, the Ministry of Agriculture is responsible for managing the commercial harvest of marine plants and issues licences for harvesting beach-cast seaweeds (Birtwell et al., 2013). However, the harvest area currently lies within overlapping jurisdictions,

including the CVRD, the RDN, and provincial and First Nations governments. There is an opportunity for industries and governments to work together on an integrated management program.

4.1.4. Species-Specific Management

Many of the plans include reference to species-specific management elements, as summarized in Table 8. Select elements are discussed in this section, including species at risk, marine birds, marine plants and select fish.

Table 8. Common species elements among management plans.

Species Management Element	Plans (n=29)
Species at risk	14
Birds	11
Marine plants	11
Fish	7
Invertebrates	7
Marine mammals	5

Based on a review of the species identified by IBA Canada and DFO, there are at least nine species that are listed as at risk (both provincially and federally) within Baynes Sound/Lambert Channel (Appendix A). Of the 29 documents analysed, 14 included specific management considerations for protecting at-risk species. The OCPs produced by the CVRD and the RDN include management provisions to protect the terrestrial nesting sites of Great Blue Herons and Bald Eagles. However, the OCPs contain no policies or recommendations for protecting the marine habitats of these species. Each of the IFMPs considered potential interactions between the subject fishery and SARA-listed species. For instance, the IFMP for Pacific Salmon includes an extensive list of at-risk species that may be encountered by salmon fisheries. However, the IFMPs are not designed to manage non-target species, and the section dedicated to species at risk is used to inform harvesters of the protective regulations regarding SARA-listed species. These rules do not apply to species that are listed as special concern.

Of each of the wildlife categories, management of birds was most frequently referenced, appearing in 11 of the planning documents. Each of the OCPs, which were produced by the regional governments and the Islands Trust, included objectives or policies related to protecting waterbirds and their adjacent habitats in Baynes Sound/Lambert Channel. Many of the marine birds in the Baynes Sound/Lambert Channel waters are dependent on herring spawn as a source of food (IBA Canada, n.d.). Any activities that negatively affect the occurrence of herring spawn (e.g. excessive harvesting activities, foreshore development or deterioration of water quality) could significantly impact the ability of the region to support a high concentration of birds (Booth, 2001).

Although only the IFMP for herring directly manages the species, 11 plans included management provisions for protecting or restoring marine plants, which are recognized as sensitive nearshore environments that provide

critical habitat for both fish and invertebrates. Eelgrass beds are particularly important spawning and juvenile nursery habitat for many species of fish, including Pacific salmon, herring and smelt (Islands Trust Conservancy, 2018). Conserving eelgrass beds is a priority for the Islands Trust, and the OCPs for Denman and Hornby islands and Islands Trust Regional Conservation Plan references the importance of protecting eelgrass habitats in foreshore areas. The intertidal region around Denman Island has some of the largest coverage of eelgrass and forage fish habitat in the entire Islands Trust Area (Islands Trust Conservancy, 2018). According to the IFMP for Geoduck and Horse Clams, there is no harvesting allowed within eelgrass beds. The BSCPSA also incorporates the location of eelgrass beds into its siting matrix and advises that future aquaculture applications continue to avoid these areas.

Only the PRWAP and the IFMP for Salmon in Southern British Columbia directly manage Pacific salmon populations. The P*untledge River Watershed Action Plan* focused most directly on maintaining or improving habitat for salmon species. According to PRWAP, DFO considers the Puntledge River summer-Chinook Salmon to be a population of high conservation concern (PRWAP, 2017). Though DFO is a member of the FWCP, the plans do not reference one another. One of the main objectives of the PRWAP is to maintain or improve populations of salmon species in the Puntledge Watershed; though the IFMP for Southern Salmon references salmon hatchery operations in the Puntledge River, it does not specifically mention the work being done by the FWCP.

Some planning documents (five in total), including the *K'ómoks Marine Use Plan*, the *IBA Conservation Plan,* and the *Helliwell Park* plan, reference the presence of the Bluntnose Sixgill Shark (*Hexanchus griseus*) in the waters off the southeastern shores of Hornby Island. A federal management plan exists for the Bluntnose Sixgill Shark, which is currently listed as a species of special concern under SARA; however it was not included in the analysis because Baynes Sound/Lambert Channel is not considered to be an Important Area for this species, according to DFO's description of the EBSA (Jamieson & Levesque, 2014).

4.1.5. Ecosystem-Level Management

Considering interrelationships at the ecosystem-level is an essential component of integrated management, and elements of an ecosystem-level approach were found in many of the management plans, as summarized in Table 9. However, this was the most difficult to quantify throughout the plans due to a lack of consistency. Of the 29 planning documents, 27 incorporated elements of ecosystem-based management (EBM). This was most often iterated through spatial conservation objectives, aimed at conserving and restoring environmentally sensitive areas to support various populations of plants, fish and wildlife. Within this context, sensitive environments are best described as areas of land and water that are susceptible to human disturbance (RDN, 2017). For instance, each of the land-use plans prioritized

protecting, restoring and enhancing sensitive ecosystems, including coastal shorelines, streams, wetlands, estuaries and the marine environment (CVRD, 2014). These objectives are principally driven by goals related to conservation, but parks and natural areas are also managed to provide public access for recreational uses, presuming that use does not compromise ecosystem conservation (CVRD, 2014). The K'ómoks Comprehensive Community Plan and the RDN AAP are the only documents that do not incorporate ecosystem-level management objectives: the K'ómoks plan guides planning at the level of the community and the AAP focuses on farming practices.

Eight of the plans explicitly incorporated an EBM approach, including the K'ómoks Marine Use Plan and the Draft Courtenay River Estuary Management Plan. The latter was specifically designed to be an integrated EBM plan, and it envisioned a productive estuarine system that provides for all species, including humans.

Table 9.
Common ecosystem elements among management plans.

Ecosystem Planning Element	Plans (n=29)
Elements of ecosystem-based management	27
Explicit ecosystem-based management approach	8

Federal fisheries and aquaculture management plans are guided by the Sustainable Fisheries Framework and the Aquaculture Policy Framework, respectively, which contain policies for adopting an ecosystem-based approach. According to the IFMP for Pacific salmon, DFO is currently in the process of moving away from single-species management and toward implementing an integrated ecosystem-based approach to science and management (DFO, 2018). In the IFMP, the department acknowledges that all activities impacting the status of harvestable populations must be considered (DFO, 2018). Each of the IFMPs includes a section titled "Ecological Interactions," which addresses potential interactions between the managing species and non-target species. However, these sections are not necessarily comprehensive, as evidenced by the IFMP for Herring, which states that there is no information available on appropriate conservation limits for herring based on ecosystem considerations (DFO, 2017a).

5. OPPORTUNITIES AND CHALLENGES FOR INTEGRATED MANAGEMENT

The results of the analysis presented in this report highlight a number of management elements that are shared by many of the various plans, as well as some where common elements are less apparent. This section offers some additional comment on the opportunities and challenges for integrating management in Baynes Sound/Lambert Channel, based on this analysis.

5.1. Opportunities

Four of five themes of analysis present strong opportunities to improve integrated management going forward. There are also linkages between some of these themes, as well as some additional observed opportunities, as discussed below. Of note, though the following sections identify the strongest opportunities for improving integrated management, a comprehensive integrated and ecosystem-based approach to management in Baynes Sound would weave management efforts across spatial zones, species, time and activities.

5.1.1. Ecosystem-based management

The near-universal inclusion of elements of ecosystem-based management among the plans provides perhaps the strongest foundation for further integration. While, as noted in previous sections, ecosystem-based management is in itself a complex undertaking, the recognition among the plans of the importance of a healthy ecosystem provides an incentive that could underpin a broader attempt at integration between plans and among diverse governing bodies. Moving toward an ecosystem approach has the potential to support the aims of many of the plans, even those with a central focus on community and/or economic development.

5.1.2. Human activities

While the management of human activities was less universal among the plans, there were still significant elements of common interest. Also note that all of these opportunities are closely tied to ecosystem health, as discussed in the previous section. Of those analyzed here, shellfish aquaculture, tourism and recreation, water quality and traditional use provide strong grounds for integration. For example, supporting intertidal aquaculture operations in Baynes Sound is a key aspect in many of the plans. However, the BSCPSA has not been updated to reflect current aquaculture regulations, which are shared by provincial and federal governments. Given that regional and First Nations governments aim to sustainably manage and develop this economic sector, a revised shellfish aquaculture plan for Baynes Sound would benefit from intergovernmental and sectoral integrated management planning.

Tourism/recreation and water quality were also common elements found in many of the plans and could benefit from an integrated approach to management. As the central aim regarding the promotion of tourism and recreation was common among plans, the opportunity for integration with this element is across sectors; for example, thinking about how the priority human activity elements interact with one another and how any conflicts can be resolved. The same is true for water quality; in the plans that included water quality as a management focus, the aims were generally aligned, but the opportunity for integration is across the various other human activity and species management elements in other plans.

Finally, many of the plans referred explicitly to traditional use of the area and its resources by First Nations. Like other elements discussed above, traditional use also provides an important foundation for integration across all of management elements discussed in this report (spatial, temporal, species, human activities and ecosystem). More comprehensive inclusion of traditional use across the remaining plans would not only further the integration of management, but would also emphasize recognition and respect for the rights of Indigenous Peoples across all plans contributing to the governance of Baynes Sound/Lambert Channel.

5.1.3. Spatial zones

While all of the management plans analyzed for this report are relevant to Baynes Sound/Lambert Channel, there are some spatial zones that present notable opportunities for greater integration. Both the intertidal and nearshore zones were referenced in approximately two-thirds of all reports. In addition, many of these plans shared similar management objectives that are generally complementary (e.g. protect sensitive ecosystems, support sustainable economic development). These two zones also correspond with some of the predominant human activity and species management elements

discussed above, including shellfish aquaculture, tourism and recreation, species at risk, birds and marine.

Additionally, at the time of writing, there was no management plan in place for the K'ómoks Estuary, which falls under the overlapping jurisdiction of local, provincial, federal and First Nations governments. If such a plan were to be developed, it would have strong potential to integrate many of the species, ecosystem and human activity elements analyzed in this report.

5.1.4. Species

The inclusion of species elements by nearly half of all plans could also provide a foundation for greater integration in Baynes Sound/Lambert Channel. As discussed, species at risk is the most common reference; however, in some plans their inclusion was limited to the terrestrial environment. By contrast, marine birds and marine plants were also common elements, with clear ties to prevalent human activities like shellfish aquaculture, water quality, tourism and recreation, wild fisheries and traditional use. Of course, species elements are a central part of the ecosystem approach discussed at the opening of this section.

5.1.5 Roles for industry and community

While this analysis largely focused on the plans generated by those governments, agencies, and First Nations with jurisdictional authority in Baynes Sound/Lambert Channel, the wide range of community and economic development interests in the region suggest that a robust attempt to integrate management within this area would benefit from the inclusion of perspectives and efforts from industry and community stakeholders.

5.2 Challenges

Notwithstanding the opportunities discussed in the previous section, there are also challenges to furthering the integration of management initiatives for Baynes Sound/Lambert Channel.

5.2.1 Varying time scales

As noted, there is no consistent temporal scale for planning and management among the plans, posing a challenge to integrated management. Although some plans forecast short-, medium- and long-term strategies, these timelines are not aligned outside of the regional land-use planning documents. Furthermore, multiple management plans are functionally redundant and require updated replacements.

However, the functional use of each of the plans dictates its time scale (e.g. fisheries for a single season, community-scale development plans for 20 years),

and forcing these plans to fit a single timescale is not only impractical, but could compromise each plan's ability to meet its unique management aims. Many of the plans include regular revision schedules, which could present an opportunity to further integration in an incremental fashion.

5.2.2 Governance

Perhaps the most central challenge of integrated management is the division of various authorities among multiple governing bodies, and the results of this analysis show this to be true in Baynes Sound/Lambert Channel. Efforts to integrate management efforts in any of the areas of opportunity highlighted above will take coordination, leadership, time and resources beyond the ordinary.

5.2.3. Need for a shared vision

Any integrated approach for Baynes Sound/Lambert Channel would benefit from a shared vision to guide its efforts, and lack of an articulated shared vision for this area could continue to hamper progress toward integrated management. While the 29 plans for Baynes Sound/Lambert Channel analyzed here do not have a common vision, the most common element in the vast majority of plans was the overall health of the ecosystem, suggesting that ecosystem health could prove a promising foundation for the development of a shared vision going forward.

5.3. Future research and next steps

Building from this report, next steps toward integrated management could include the following:

- Development of a shared vision for Baynes Sound/Lambert Channel
- Pilot (trial) initiative to improve integration of one of the opportunity areas described above
- Further research into successful integrated management models implemented in the marine environment at a similar scale
- Gathering of comprehensive baseline data for the Baynes Sound/Lambert Channel ecosystem, to create a common foundation for integrated management efforts
- Update of outdated or unimplemented management plans, including regular revisions, with effort to improve integration and to better include and recognize traditional use and the rights and title of Indigenous Peoples.

6. CONCLUSION

The aim of this report was to assess the current degree of integration among existing management plans for Baynes Sound/Lambert Channel. To identify the current state of integration, a content analysis was conducted to comparatively analyse the management components of each of the 29 planning documents. The report considered key facets of integrated management and assessed the level of consistency and coordination among spatial and temporal scales, management of human activities, species-specific management and ecosystem-level management.

The results of the analysis indicated that the management plans, as they currently operate, have all been developed independently, and are for the most part not integrated. However, several common management elements emerged and were discussed as opportunities for improving integrated management going forward. The most prevalent of these opportunities stems from a near-universal interest in ecosystem-level health found in the plans. Many of the opportunity areas identified have strong management connections to each other, across sectors, spatial zones and species, further strengthening the foundation for improved integration. The results also highlighted challenges for the further integration of management in the region, including the complexities of governance, and the need for a shared vision for the region.

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As a region of significant ecological productivity and economic activity, the sustainable management and development of Baynes Sound/Lambert Channel suggests an integrated approach. Canada has committed to pursuing an integrated approach for management of its marine territory, considering it to be the cornerstone of its oceans governance policy. Finally, though this report identified the strongest opportunities for improving integrated management, a comprehensive integrated and ecosystem-based approach to management in Baynes Sound would weave management efforts across spatial zones, species, time and activities for the long-term benefit of all.

For more information, please contact:
Kim Dunn, Senior Specialist, Ocean Conservation
kdunn@wwfcanda.org

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APPENDIX A

Regional Species

Species within Baynes Sound/Lambert Channel, as identified by DFO and IBA Canada (Jamieson & Levesque, 2014; IBA Canada, n.d.). Species are considered to be at risk if they are Blue- or Red-Listed by the Province of British Columbia, or SARA-listed as Special Concern, Threatened or Endangered. These at-risk species are marked with shading.

SPECIES GROUP	SPECIES	AGENCY IDENTIFIED	B.C. LIST STATUS	SARA STATUS	COSEWIC STATUS	NATIONAL PLAN	PROVINCIAL PLAN
Birds	Black Oystercatcher	IBA	Yellow	N/A	N/A		
	Black Turnstone	IBA	Yellow	N/A	N/A		
	Brant	DFO & IBA	Blue	N/A	N/A	NO	NO
	California Gull	IBA	Blue	N/A	N/A		
	Glaucous-winged Gull	IBA	Yellow	N/A	N/A	NO	NO
	Great Blue Heron (*fannini* subspecies)	IBA	Blue	Special Concern	Special Concern	YES	NO
	Greater Scaup	IBA	Yellow	N/A	N/A		
	Harlequin Duck	DFO & IBA	Yellow	N/A	N/A	NO	NO
	Heermann's Gull	IBA	Unknown	N/A	N/A		
	Marbled Murrelet	IBA	Blue	Threatened	Threatened	YES	YES
	Mew Gull	IBA	Yellow	N/A	N/A	NO	NO
	Pelagic Cormorant	IBA	Yellow	N/A	N/A		
	Peregrine Falcon (*pealei* subspecies)	IBA	Blue	Special Concern	Special Concern	YES	YES
	Red-necked Grebe	IBA	Yellow	N/A	N/A		
	Surfbird	IBA	Yellow	N/A	N/A		
	Surf Scoter	IBA	Blue	N/A	N/A	NO	NO
	Thayer's Gull	IBA	N/A	N/A	N/A	NO	NO
	Trumpeter Swan	IBA	Yellow	N/A	Not at Risk	NO	NO
	Western Grebe	IBA	Red	Special Concern	Special Concern	NO	NO
	Western Screech-Owl (*kennicottii* subspecies)	IBA	Blue	Threatened	Threatened	NO	YES
	White-winged Scoter	IBA	Yellow	N/A	N/A		
Marine Mammals	Harbour Seal	DFO	Yellow	Not at Risk	N/A	NO	NO
	Steller Sea Lion	DFO	Blue	Special Concern	Special Concern	YES	NO
Pelagic Fish	Herring	DFO	No Status	N/A	N/A	NO	NO
Invertebrates	Butter Clam	DFO	N/A	N/A	N/A	NO	NO

APPENDIX B

Code list

CODE	MEANING
Adaptive	• The plan references adaptive management strategies (e.g. ability to adjust to changing circumstances)
Aquaculture	• Reference to management of aquaculture operations
Authority	• The agency that created the plan/who the management plan was created for
Baynes Sound/Lambert Channel	• Specific reference to Baynes Sound/Lambert Channel
Birds	• Management of marine birds
Coast	• Specific coastal management issues/objectives
Collaboration	• References interagency/intergovernmental collaboration
Comox	• Reference to Comox or the Comox Valley Regional District
Denman Island	• Specific reference to Denman Island
Development	• Used to talk about population growth, demographics etc.
EBM	• Also used as a vague term whenever development as an objective comes up
Economic Activities	• Reference to EBM
Ecosystem Connections	• Reference to industries in the marine/coastal areas
Fishery Commercial	• Mention ecosystem connections (interactions between species, habitats, etc.)
Fishery FN	• Reference commercial fisheries
Fishery Recreational	• Reference First Nation fisheries
Geoduck	• Reference recreational fisheries
Hornby	• Mention of geoduck fishery/aquaculture
Human Well-Being	• Hornby Island
IBA	• Reference to human well-being as a management objective
Implementation Priorities	• Reference the K'ómoks IBA/three former IBAs prior to the amalgamation
Infrastructure	• What are the key actions/objectives outlined in the management plan?
Integration	• Reference to ports, harbours, sea-walls
Intertidal	• Direct reference to integrated planning/management strategies
Intertidal Clam	• Reference intertidal/foreshore areas
Islands Trust	• Management of intertidal clams
Jurisdiction	• Mention of Islands Trust
K'ómoks Estuary	• Specific reference to jurisdictional boundaries/overlaps
K'ómoks FN	• Reference K'ómoks Estuary/Courtenay River Estuary

CODE	MEANING
Key Issues	• Key issues identified in the plan
Knowledge	• Reference to knowledge type (traditional and scientific)
Marine Transportation	• Reference to marine transportation (e.g. BC ferries)
Mission	• Mission statement of the plan/agency
Nanaimo	• Reference to Nanaimo or Nanaimo Regional District
Objectives	• Management objectives that are relevant to the scope of the plan (associated with the marine environment in Baynes Sound/Lambert Channel)
Opportunities	• Management opportunities that have been identified in the plan
Park Lands	• Reference to provincial parks located in the plan area
Plan Purpose	• Purpose/intent/aim of management plan
Policies	• Relevant policies to support marine-related objectives
Pollution	• Reference to marine pollution, including liquid and solid waste
Precautionary	• Mention of the precautionary principle in planning/decision making
Principles	• Principles that guide management
Recreational Use	• Recreational uses/activities in the marine/coastal environment
Research	• Research objectives/activities in the marine area
Rockfish	• The reference rockfish
Salmon	• Reference to Pacific Salmon
Seaweed	• Management of seaweed harvesting
Shellfish	• Harvesting
Spatial Scale	• Description of plan area, including boundaries and size
Species	• Management of specific species
Strategies	• Strategies to address management issues
Temporal Scale	• Broad code encompassing date implemented, length of intended management period, phased targets
Tourism	• Reference to tourism activities/management strategies
Traditional Use	• Reference to traditional use of the area and/or its resources by Indigenous Peoples
Values	• Guiding management values
Vision	• Vision for management
Watershed	• Any reference to relevant freshwater systems – Puntledge River Watershed
Zoning	• Does the plan include spatial zoning?

APPENDIX C

Management Plan Summaries

Fisheries Management

TITLE **Integrated Fisheries Management Plan for Roe Herring (Pacific Region)**
AGENCY Fisheries and Oceans Canada
YEAR 2017

This management plan encompasses the period of 7 November 2017 to 6 November 2018, and is the most up-to-date plan available from the federal website. This IFMP manages all First Nations, commercial and recreational herring fisheries throughout the Pacific Region. There are four commercial herring fisheries: Roe Herring, Spawn on Kelp, Food and Bait Herring and Special Use Herring. The IFMP is consolidated with fishing plans for each of the commercial fisheries. The commercial fisheries occur coastwide within Major and Minor Stock Assessment Areas, as well as other management areas and sub-areas.

The IFMP provides a comprehensive overview of herring fisheries, and outlines management issues, objectives, and measures, as well as evaluation criteria. The plan highlights a number of ongoing, short- and long-term management issues associated with fisheries management. Specific issues associated with the commercial roe herring fishery are related to licencing fees, annual fluctuations of coastwide total allowable catch, fishery timing and in-season management. The plan also details objectives for resource management, which include stock conservation and sustainable harvest, ecosystem processes, renewal of the management framework, consultation, and social, cultural and economic considerations.

TITLE **Integrated Fisheries Management Plan for Salmon in Southern B.C**
AGENCY Fisheries and Oceans Canada
YEAR 2018

This management plan encompasses the time period of 1 June 2018 until 31 May 2019. The IFMP manages all First Nations, commercial and recreational salmon fisheries throughout southern British Columbia. The spatial scale for the plan encompasses all tidal and non-tidal waters from Cape Caution south to the British Columbia/Washington boarder. Within this region, the commercial fishery is spatially managed through Pacific Fishery Management Areas (PFMAs). The management plan covers the management of several salmon species, namely Chinook, Chum, Coho, Pink and Sockeye.

This IFMP provides a comprehensive overview of Pacific Salmon fisheries, and outlines management issues, objectives, guidelines for general decisions, access and allocation, a compliance plan and evaluation criteria. It also provides detailed species-specific management fishing plans. The management issues identified in the plan relate to conservation initiatives, international commitments, and ocean and habitat considerations. The former section details potential ecosystem interactions, which may occur with the salmon fishery, reviewing protocol associated with encounters with species at risk, whales, turtles and basking sharks and seabirds. The plan outlines management objectives for stocks of concern.

TITLE **Integrated Fisheries Management Plan for Geoduck and Horse Clam (Pacific Region)**

AGENCY Fisheries and Oceans Canada

YEAR 2019

This management plan encompasses the period of 1 March 2019 until 28 February 2020. IFMP manages all First Nations, commercial and recreational geoduck and horse clam fisheries throughout the Pacific Region. First Nations and recreational fishing may occur coastwide, however, openings are contingent upon in-season closures. The commercial fishery occurs coastwide within spatial units called Geoduck Management Areas (GMAs), designed to manage effort based on quotas. The commercial fishery is also subject to in-season closures. Closures to the fisheries may take place for a number of reasons, due to parks, marine reserves, research, navigation, or sanitary and marine biotoxin contamination.

The IFMP provides an overview of the fisheries, management issues and objectives, a compliance plan and a performance review. Management issues for the geoduck fishery include predation by sea otters, impacts of climate change, and the retention of biotoxins. Management objectives for the geoduck and horse clam fisheries are related to stock conservation, sustainability, ecosystem considerations (e.g. avoiding eelgrass beds and other sensitive habitats), aquaculture and social, cultural and economic considerations.

TITLE **Integrated Fisheries Management Plan for Intertidal Clams (Pacific Region)**

AGENCY Fisheries and Oceans Canada

YEAR 2019

The IFMP for Intertidal Clams is a three-year plan that is in effect from 1 January 2019 to 31 December 2021. It covers the commercial harvest of intertidal clams in the Pacific Region. The IFMP covers the management of four species of intertidal clam: Manila clam, native littleneck clam, butter clam and varnish (savoury) clam. Intertidal clams are harvested during low tide cycles by hand digging only. Openings for the commercial fishery occur thoughout the year and may be 1 to 4 days in duration. First Nation and recreational fisheries may occur year-round in all the waters of British Columbia. Openings are reliant on market conditions, water quality and weather. The IFMP provides an overview of the fishery, management issues and objectives, access and allocation, a compliance plan and a performance review. Management issues associated with the commercial fishery are related to harvest opportunities, clam eligibility nominations, the number of licenses issues and catch reporting. Management objectives for intertidal clams involve conservation and sustainability, collaborative management, and social, cultural and economic considerations.

Aquaculture Management

TITLE **Baynes Sound Coastal Plan for Shellfish Aquaculture**

AGENCY Province of British Columbia - Ministry of Sustainable Resource Management, The Coast and Marine Planning Branch[9]

YEAR 2002

The BSCPSA is a sector-specific local plan developed by the Government of British Columbia to guide the allocation of shellfish aquaculture tenures in foreshore and nearshore areas, and to identify areas of significant conservation potential. The plan area is located between Denman Island and Vancouver Island, and includes Comox Harbour. It includes all near-shore waters, shoreline and inter-tidal areas within Baynes Sound and Comox Harbour to the high tide mark. The plan provides an overview of shellfish aquaculture in Baynes Sound, and describes the environmental analysis and independent review that was undertaken for the industry, as well as compliance, enforcement and dispute resolution process. It also presents management areas to guide potential aquaculture tenure applications, and details opportunities and constraints on future operations. The BSCPSA was intended to be useful for many years, and was anticipated to evolve over time based on new information and results from implementation and effectiveness monitoring.

[9] The Coast and Marine Planning Branch was disbanded in 2004, and the Ministry of Sustainable Resource Management disbanded in 2005. Coastal planning processes relocated to the Integrated Land Management Bureau of the Ministry of Agriculture and Lands. Retrieved from: http://www.dfo-mpo.gc.ca/Library/322547.pdf

TITLE **Integrated Framework for Geoduck Management**
AGENCY Fisheries and Oceans Canada
YEAR 2017

The Integrated Framework for Geoduck Management (IFGM) provides a harmonized framework to manage both wild and aquaculture geoduck fisheries. The framework encompasses all areas of the Pacific Coast, which is the only region in Canada where geoduck fisheries occur. The document first outlines the history and current status of wild commercial geoduck harvest and aquaculture in British Columbia. The framework then provides siting guidelines for new shellfish aquaculture operations, to inform proponents about which criteria are likely to affect application approval. It also details management issues and objectives for geoduck aquaculture, including diligent use of sites, access to wild stock and monitoring and traceability.

TITLE **Shellfish Integrated Management of Aquaculture Plan**
AGENCY Fisheries and Oceans Canada
YEAR 2017

The Shellfish IMAP was created to identify the main objectives and requirements for the management of shellfish aquaculture in British Columbia, as well as the management measures used to meet these objectives. This plan was designed for the Pacific Region, and covers the cultivation of any shellfish within a marine environment, including the foreshore, intertidal, and deep-water areas. The plan encompasses all cultivated species of shellfish within British Columbia, including oysters, clams, geoduck clams, mussels and scallops. It also includes aspects related to the culture of molluscs, crustaceans, and echinoderms, but not algae or marine plants. The IMAP provides an overview of the sector, describes the legislation, governance and policies related to the sector, and outlines the management approach. DFO has identified multiple management priorities and initiatives involving shellfish aquaculture, concerning new and emerging species, engagement and outreach on science and research, the Canadian Shellfish Sanitation Program (CCSP), public reporting and regulatory reform.

Species Conservation

TITLE **Baynes Sound/Lambert Channel-Hornby Island Waters Important Bird Areas Conservation Plan**
AGENCY Important Bird Areas Canada
YEAR 2001

This conservation plan manages the area that is currently encompassed by the K'ómoks Important Bird Area (BC 272), but was developed prior to the amalgamation of three regional sites which occurred in 2013. The plan involves the former Baynes Sound and the Lambert Channel-Hornby Islands Waters IBAs. The plan area includes 56,073 ha of coastal waters surrounding Denman and Hornby Islands, covering the estuaries and inland both north and south of the city of Courtenay. This conservation plan provides an overview of the birds present within these two IBAs, and includes species accounts for the following: Pacific Loon, Western Grebe, Pelagic Cormorant, Surf Scoter and White-winger Scoter, Harlequin Duck, Great Blue Heron, Trumpeter Swan, Bald Eagle, Black Turnstone, Brant, Mew Gull, Thayer's Gull and Glaucous-winged Gull. It details issues that may affect the bird abundance and their associated habitats, highlights some of the initiatives that were addressing those issues, and identified future initiatives that could further address those concerns. The key conservation concerns are shoreline development, water pollution, the herring fishery, shellfish farming and human disturbance. The plan is intended to facilitate conservation initiatives undertaken by non-government organizations and to guide future efforts.

TITLE **Management Plan for the Steller Sea Lion *(Eumetopias jubatus)* in Canada**

AGENCY Fisheries and Oceans Canada

YEAR 2010

The Steller Sea Lion is provincially blue-listed and federally listed as a species of special concern (both SARA and COSEWIC). However, as an aquatic species they fall under federal jurisdiction, managed by DFO, and do not possess a provincial management plan. SARA management plans are action-oriented planning documents that identify the conservation activities and land-use measures required to prevent a species from becoming threatened or endangered. The ultimate goal of management plans is to eventually mitigate the identified human threats and remove the species from the List of Wildlife Species at Risk. This plan provides advice to jurisdictions and organizations that are involved with or wish to be involved with the conservation of this species.

Within Canada, populations of Steller Sea Lion only occur in British Columbia. Key threats impacting populations in British Columbia include prey reduction (associated with fisheries competition and environmental change and variability), environmental contaminants, disturbance and toxic spills. Other less concerning threats are impacts from incidental take, entanglement in marine debris, illegal kills and predation by Killer Whales.

The plan has two main goals for the species: 1) to ensure that human threats from Canadian sources do not cause unsustainable population declines, contraction of current range or number of breeding sites in Canada, and 2) to encourage support for and contribution to research and monitoring of Steller Sea Lion populations in British Columbia, to improve the global knowledge of the Eastern Pacific Population. The management actions proposed to achieve these objectives are to be implemented according to a phased timeline, up to four years following adoption of the plan.

TITLE **Recovery Strategy for the Marbled Murrelet *(Brachyramphus marmoratus)* in Canada**

AGENCY Environment and Climate Change Canada

YEAR 2014

The Marbled Murrelet is provincially blue-listed and federally listed as threatened (both SARA and COSEWIC). This strategy assesses the feasibility of recovery for the Marbled Murrelet; provides an overview of the status, life history, distribution and habitat; identifies key threats; and describes strategies and approaches to meet objectives. Threats to populations in British Columbia include habitat loss or degradation, natural processes or activities (e.g. predation and disease), accidental mortality, pollution, and climate and natural disasters.

Unlike the provincial implementation plan for Marbled Murrelets, which only addresses terrestrial habitat on crown lands, the federal strategy considers management measures for the marine habitat. The strategy sets both short- and long-term population and distribution objectives. The short-term objective (10 to 20 years) is to stop the decline of British Columbia population and the area of its nesting habitat. The long-term objective (25+ years) is to ensure that the species will have a high probability of persistence beyond 2032 across its range.

TITLE **Management Plan for the Great Blue Heron *fannini* subspecies *(Ardea herodias fannini)* in Canada [Proposed]**

AGENCY Environment and Climate Change Canada

YEAR 2016

The Great Blue Heron, *fannini* subspecies, is provincially blue-listed and federally listed as a species of special concern (both SARA and COSEWIC). This proposed management plan was released in 2016 and remains the latest available version from the federal website. The management plan provides an overview of the status, life history, distribution and habitat; identifies key threats; and describes strategies and approaches to meet objectives.

The key threats to Great Blue Herons are predation and harassment by Bald Eagles. This can lead to colony abandonment and reduced colony productivity, and nesting and foraging habitat loss due to commercial and residential development. Other threats to the species include habitat loss from industrial activities, disturbance by humans, road mortality and aquaculture operations. The sole management objective for the Great Blue Heron is to ensure that all four conservation regions in British Columbia have stable or locally increasing population numbers. The management plan includes a number of strategies and conservation measures to achieve this objective. The timeline for implementation of these measures extends to 2021. Progress toward the objective is measured by indicator targets and monitored every five years.

TITLE **Management Plan for the Peregrine Falcon *pealei* subspecies (*Falco peregrinus pealei*) in Canada**

AGENCY Environment and Climate Change Canada and the Government of British Columbia, Ministry of Environment

YEAR 2017

The Peregrine Falcon, *pealei* subspecies, is provincially blue-listed and federally listed as special concern (both SARA and COSEWIC). To promote cooperative efforts between provincial and federal governments, the Government of British Columbia gave permission to the Government of Canada to incorporate the existing provincial plan, *Management Plan for the Peregrine Falcon, pealei subspecies (Falco peregrinus pealei) in British Columbia*, into the SARA plan. The addition of a federal component, which addresses the effects of management actions on the environment and other species, completes SARA requirements.

The plan includes all populations of Peregrine Falcon across coastal British Columbia. The greatest threats to species are impacts from pollution, specifically oil spill events. Since the falcons almost exclusive preys on seabirds, oil spills could have short- and long-term impacts related to their consumption of prey. Other threats include natural system modifications, human disturbance and invasive species. The plan details both short- and long-term goals. The short-term is to maintain the population size within ±5% of recent estimates and retain current distribution; the long-term goal is to increase the population to levels closer to that of the 20th century. Progress toward management goals is monitored every five years.

First Nations Resource Management

TITLE **K'ómoks Marine Use Plan**

AGENCY K'ómoks First Nation

YEAR 2012

The K'ómoks Marine Use Plan was created to provide the overall strategic direction for marine uses and activities within the traditional territory of K'ómoks First Nation. The plan encompasses K'ómoks marine territory, which includes H'ksum (Kelsey Bay) and Johnstone Strait in the north and Hornby/Denman Island and a portion of the Georgia Strait in the south, as well as all the rivers that flow into the ocean from central Vancouver Island. The plan provides a statement on K'ómoks title and rights, documents the Nation's past present and future marine activities, and outlines the Nation's vision, values and teachings, and issues and concerns for their marine territory.

The plan identifies three regional planning units, which are further delineated into zones for specific management actions: Integrated Management zones, Protection zones and Special Management zone. The document details five General Management Directions that apply to each of the management zones in the plan, including Protocol; Meaningful Consultation; Development Principles; First Nation's EBM; and Stewardship. The traditional teachings of First Nation's EBM are analogous to the scientific principles of EBM, and include principles related to integrated management, sustainable long-term use, precautionary and adaptive management approaches, and inclusive and participatory planning and decision-making.

TITLE **K'ómoks First Nation Comprehensive Community Plan**

AGENCY K'ómoks First Nation

YEAR 2014

The Comprehensive Community Plan sets out a vision or future target elements of importance to a community, including lands, governance, education, health, safety, environmental protection, cultural values and sustainability. The plan guides community planning within the terrestrial territory of the K'ómoks First Nation, spanning 813,605 ha along the east coast of Vancouver Island. The document describes the background and processes, which led to the development of the plan, and then provides an overview of past, present and future aspects for the K'ómoks First Nation. The plan sets out a vision for the future, which encompasses K'ómoks community members, lands, infrastructure, governance, environment and wildlife, economic development and sustainability.

Land and Marine Use Planning

TITLE **Comox Valley Regional Growth Strategy**
AGENCY Comox Valley Regional District
YEAR 2010

The Regional Growth Strategy (RGS) is one of four regional strategies that have been designed to guide future growth in Comox Valley. It also serves to inform the provincial government of local priorities and objectives, so that they can align their own program delivery in support of these priorities. This land-use planning strategy encompasses the entirety of Comox Valley, excepting Denman and Hornby Islands for which planning is carried out by the Islands Trust Conservancy. The RGS provides an overview of major trends affecting the Comox Valley, which centre around managing an increasing population and responding to climate change. The strategy describes goals to guide long-term growth, which organized into eight inter-related policy areas: Housing; Ecosystems, Natural Areas and Parks; Local Economic Development; Transportation; Infrastructure; Food Systems; Public Health and Safety; and Climate Change. The document then details strategies, policies and schedules for long-term management, which provide a general framework for directing growth and land-use activities in Core Settlement Areas, Rural Areas, and Resource Areas and Parks.

TITLE **Comox Valley Sustainability Strategy**
AGENCY Comox Valley Regional District
YEAR 2010

The Sustainability Strategy is one of four regional strategies that have been designed to guide future growth in Comox Valley, including Denman and Hornby Islands. It is a strategic document that covers a wide range of issues which a necessary to address in order to achieve long-term sustainability in the region. The strategy provides recommendations and an overarching direction to guide local level planning documents (i.e. OCPs and local bylaws). It outlines regional and global visions for sustainability, and sets targets for the year 2050. Targets relate to the following globally significant topic areas: Climate, Energy, Water, Ecosystems, Waste, Food, Economy and Society. The strategy then examines the means by which Comox Valley can make progress toward global targets, managing human development in housing and development, transportation, ecosystems, natural areas and parks, and local economic development, among others. The document details specific goals, objectives, targets and prioritized actions for each of these areas of development.

TITLE **Rural Comox Valley Official Community Plan**
AGENCY Comox Valley Regional District
YEAR 2014

This OCP was designed to manage the electoral areas in Comox Valley, and excludes lands within the municipal boundaries of Comox, Courtenay and Cumberland; Denman and Hornby Islands; and lands within the jurisdiction of the K'ómoks First Nation. Though the OCP is guided by the regional strategies, it contains more detailed policies and a regulatory framework, which define land-use permissions. The plan forecasts 20 years into the future to remain consistent with the projections of the Regional Growth Strategy and the Sustainability Strategy. It outlines regional objective and polices concerning the natural environment, sensitive ecosystems, parks and greenways, climate change, natural hazards, the economic and industry, transportation, infrastructure, cultural heritage resources and housing. The plan divides land-use policies based on area designation (i.e. rural settlement areas, parks and natural areas, agricultural areas and coastal areas). The document concludes with a framework for implementation of the OCP, outlining lists or examples of permitted uses within the applicable designation.

TITLE **Denman Island Official Community Plan**
AGENCY Denman Island Local Trust Committee
YEAR 2008

This OCP was designed to manage the Denman Island Local Trust Area, including the surrounding marine waters. It serves as a general statement outlining the goals of the Denman Island community, and detailing policies that will support these goals. The OCP must be consistent with the conservation mandate of the *Islands Trust Act*, as well as provincial interests. The plan divides land-use policies based on area designations, which include conservation/recreation, crown lands, rural and sustainable resource. All activities carried out in the plan area must abide by the guiding principles, supported by guiding objectives, which involve protecting the integrity of natural ecosystems, protecting the elements integral to the social fabric of the island, and providing for needs of families and individuals. The plan then details development permits area, which limits permitted uses, as well as administrative information.

TITLE **Hornby Island Official Community Plan**
AGENCY Hornby Island Local Trust Committee
YEAR 2014

This OCP encompasses the Hornby Island Local Trust Area, including the surrounding marine waters. It serves as a general statement outlining the goals of the Hornby Island community, detailing policies that will support these goals. The OCP must be consistent with the conservation mandate of the *Islands Trust Act*, as well as provincial interests. The plan provides an overview of the general objectives and policies for the community and for all land use. Further descriptions of policies and objectives are divided into the following categories: protection of the environment, stewardship of resources, sustainable infrastructure and sustainable land use. The plan then details administrative information, related to implementation and revision.

TITLE **Regional Growth Strategy – Shaping our Future**
AGENCY Regional District of Nanaimo
YEAR 2011

The Regional Growth Strategy (RGS) was created to establish a consistent and coordinated approach throughout the Regional District of Nanaimo (RDN). The strategic document is based on the premise that all decision-making and actions undertaken by the RDN must be based on sustainability principles (i.e. the healthy functioning of ecological systems is nurtured, and the interconnectedness of natural and human systems is recognized and respected). The policies and land-use designations in this RGS provide a general framework for directing growth and land-use activities. The plan applies to all areas in the RDN, covering approximately 207,000 hectares, with the exception of Gabriola, Decourcy and Mudge Islands (for land-use planning purposes, they fall under the jurisdiction of Islands Trust Conservancy) and non-participating First Nations Community Lands. The plan is based on 11 goals and related policies to help guide growth of the region toward the desired future, including preparing for climate change and reducing energy consumption, protecting the environment and enhancing economic resiliency. The strategy includes implementation actions to support each of the goals. It also includes maps demonstrating land-use designations within the RDN.

TITLE **Growing Our Future Together – Regional District of Nanaimo Agriculture Area Plan**
AGENCY Regional District of Nanaimo
YEAR 2012

The Agricultural Area Plan (AAP) was created to provide clear and implementable recommended actions toward the goal of enhancing local food production in the RDN. The AAP contains a vision statement for agriculture and aquaculture in the RDN, as well as goals and objectives for achieving that vision. Since the plan operates within local land-use policies and regulations, it provides an overview of the RDN Land Use Policy Framework (including the Regional Growth Strategy and OCPs). The AAP recommends actions and key players to lead or support specific actions to achieve each of the goals, and provides an implementation strategy, a monitoring and evaluation plan, and additional resources and funding information.

TITLE **Electoral Area 'H' Official Community Plan**
AGENCY Regional District of Nanaimo
YEAR 2017

This OCP was designed to manage the RDN Electoral Area H, which borders the CVRD to the north, Alberni-Clayoquot Regional District to the west, and the Strait of Georgia to the east. The plan serves as a general statement outlining the objectives and policies of the local government to manage existing and future uses of land, coastal areas and surface waters within the plan area. The OCP is organized around key issue areas, which fall under the following categories: the natural environment, natural resource management and community resources. The plan also contains a Development Strategy that sets the parameters for development within the community, intended to minimize urban sprawl. The Development Strategy is consistent with the Regional Growth Strategy. The plan also includes objectives to respect and support economic development opportunities that are sought by Qualicum First Nation. The plan includes an implementation schedule for specific actions to achieve objectives.

TITLE **Courtenay River Estuary Management Plan. Volume 1. Integrated Management Plan. Working Draft**
AGENCY Fisheries and Oceans Canada
YEAR 2001

The Estuary Management Plan is a policy-based document that was intended to be a guide and to provide a planning process for all users of the K'ómoks Estuary, though it was never adopted or implemented by local governments. It was designed to achieve integrated management and coordinated decision-making among agencies. The geographical scope of the plan encompasses 2,170 ha of land and water in the K'ómoks Estuary, including parts of the CVRD and K'ómoks reserve lands. The plan presents a vision, goals and objectives, administrative structures and action programs for managing the estuary. The action programs for the estuary are organized into the following themes: industrial and urban development; log storage and handling management; navigation and dredging; recreation; water quality management; and plant, fish and wildlife habitat.

TITLE **Puntledge River Watershed Action Plan**
AGENCY Fish and Wildlife Compensation Program
YEAR 2017

This Action Plan builds off strategic objectives of the Fish and Wildlife Compensation Program (FWCP), and specifies actions that will conserve, restore and enhance fish and wildlife species and their habitats. The plan encompasses a five-year planning period for the Puntledge River Watershed, including the K'ómoks Estuary. It presents an overview of the watershed, including issues, threats and past projects. The plan identifies Priority Actions for three broad ecosystem categories: rivers, lakes and reservoirs; wetland and riparian areas; and upland and dryland. Each of the priority actions are eligible for an FWCP grant. The plan also provides background information about each of the ecosystems, and describes specific objectives and measures.

Land and Marine Conservation

TITLE **British Columbia and The Nature Trust Joint Conservation Land Management Program (West Coast)**
AGENCY The Nature Trust and the Province of British Columbia
YEAR 2016

This document is an application submitted by the Nature Trust to the Government of British Columbia detailing the objectives for its three-year Joint Conservation Land Management Program. The management program includes all parcels of lands on the Pacific Coast that are owned by the Nature Trust and jointly managed with the Province of British Columbia. The application document includes conservation and management related goals and objectives for each conservation area, as well as short- and long-term performance indicators.

TITLE **Islands Trust Conservancy Regional Conservation Plan 2018-2027.**

AGENCY Islands Trust Conservancy

YEAR 2018

The Islands Trust Conservancy Regional Conservation Plan is a broad planning document for marine and terrestrial ecosystems within Islands Trust Area, which encompasses all the islands and waters between the mainland of British Columbia and Vancouver Island. The plan provides an overview of the conservation significance of the islands and its approach to conservation planning. The purpose of the plan is to describe current land status and land use, including key threats and priority conservation areas, and to set goals and areas of focus for the next ten years. The plan includes area profiles for each of the islands under Islands Trust jurisdiction.

TITLE **Fillongley, Tribune Bay, Helliwell and Sandy Island Provincial Parks Master Park Plan.**

AGENCY Ministry of Environment and Parks

YEAR 1987

The Master Plan provides broad, long-term direction to the management of Fillongley, Tribune Bay, Helliwell and Sandy Island Provincial Parks. The plan provides a summary from the "Background Report" on the park area, outlining the location and climate, as well as the origins and resources of the parks. The geographical descriptions for each of the parks are as follows:

- Fillongley Provincial Park is located on the north side of Denman Island and contains 23 ha of terrestrial land, adjoined by a 21-hectare foreshore recreation reserve. The adjacent recreation reserve contains approximately 550 m of tidal frontage and about 18 ha foreshore waters.
- Sandy Island Provincial Park is located off the north end of Denman Island and comprises four small islands totaling 33 ha. Sandy Island and Seal Islets are the portions of White Spit, which remain above the high tide mark; there is no marine component to the park.
- Tribune Bay Provincial Park is located on the north side of Hornby Island and spans 96 ha, of which 23 are foreshore and 73 are terrestrial.
- At the time of publishing, Helliwell park only contained 69 ha of upland.

For each of the parks, the Master Plan details specific roles (related to conservation and recreation), zoning, natural and cultural resource management objectives and actions, visitor services and priority actions for plan implementation.

TITLE **Boyle Point Provincial Park Master Plan**

AGENCY Ministry of Parks

YEAR 1990

This Master Plan provides broad, long-term direction to the management of Boyle Point Provincial Park. Boyle Point is located at the southern tip of Denman Island. The park includes 125 ha of land, and does not include an intertidal or underwater component. The main issues addressed in the plan include the expansion of park boundaries into adjacent natural areas of significance and the type and level of development required. The plan details the role of the park (related to conservation and recreation), zoning, natural and cultural resource management objectives and actions, visitor services and priority actions for plan implementation.

TITLE **Helliwell Provincial Park Ecosystem Based Plan**

AGENCY BC Parks, Strathcona District

YEAR 2001

This is an ecosystem-based plan for Helliwell Park, which recognizes interactions between human and human systems and gives direction for the maintenance or restoration of natural processes. Helliwell Provincial Park is located on the southeast side of Hornby Island and is comprised of both terrestrial and marine components. The total area is 2872 ha; the upland portion consists of 69 ha and the marine portion includes 2803 ha of foreshore including Flora Islet. The approach for this ecosystem-based plan was based on the understanding that effective management of systems and species must take into account the historical range of variability for ecosystems. The objectives of the report are to provide information on the ecological and cultural history of the park and to establish a baseline inventory of flora and fauna species, together with management recommendations. A multidisciplinary approach was required to obtain this information, involving a literature review of palaeoecological research and Traditional Ecological Knowledge, Terrestrial Ecosystem Mapping, Marine Ecosystem Mapping, public consultations and management literature reviews. The plan identifies issues and risks in the park area, and proposes key concepts for management (such as managing for ecological purposes and not individual species).

The plan also includes detailed lists of management tasks to resolve problems, based on management categories (including management of access, management of invasive animal species and subtidal restoration). The report divides the terrestrial portion of the park into nine vegetation management zones, based on the ecosystem mapping units. Management recommendations in these units are specific to the ecosystem. To aid planning for the different ecosystems contained within the park, the plan includes detailed accounts for seven key species, which represent each of the habitat types.

APPENDIX D

Semi-Quantitative Analysis: Full Results

SPATIAL Plan	Primarily Land Use Plans	Terrestrial	Coast	Shoreline	Intertidal Zone/ Foreshore	Nearshore	Off-shore	Surface Waters	Comox Harbour	Estuary	Baynes Sound Referenced Specifically
Baynes Sound Coastal Plan for Shellfish Aquaculture				✔	✔	✔			✔		✔
Baynes Sound/Lambert Channel-Hornby Island Waters Important Bird Areas Conservation Plan		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Boyle Point Provincial Park Master Plan	✔	✔	✔	✔	✔						✔
British Columbia and The Nature Trust Joint Conservation Land Management Program (West Coast)	✔	✔								✔	✔
Comox Valley Regional Growth Strategy	✔	✔	✔	✔	✔	✔		✔		✔	✔
Comox Valley Sustainability Strategy	✔	✔	✔	✔	✔	✔		✔		✔	✔
Courtenay River Estuary Management Plan										✔	✔
Denman Island Official Community Plan	✔	✔	✔		✔	✔					✔
Electoral Area 'H' Official Community Plan (Nanaimo)	✔	✔	✔	✔	✔			✔			✔
Fillongley, Tribune Bay, Helliwell and Sandy Island Provincial Parks Master Park Plan	✔	✔	✔	✔	✔						✔
Growing Our Future Together – Regional District of Nanaimo Agriculture Area Plan	✔	✔			✔			✔			✔
Helliwell Provincial Park Ecosystem Based Plan		✔	✔	✔	✔	✔	✔				✔
Hornby Island Official Community Plan	✔	✔	✔		✔	✔					✔
Integrated Fisheries Management Plan for Geoduck and Horse Clam (Pacific Region)					✔	✔					✔
Integrated Fisheries Management Plan for Intertidal Clams (Pacific Region)					✔						✔

Plan	Primarily Land Use Plans	Terrestrial	Coast	Shoreline	Intertidal Zone/ Foreshore	Nearshore	Off-shore	Surface Waters	Comox Harbour	Estuary	Baynes Sound Referenced Specifically
Integrated Fisheries Management Plan for Roe Herring (Pacific Region)					✔	✔	✔				✔
Integrated Fisheries Management Plan for Salmon in Southern B.C					✔	✔	✔	✔	✔		✔
Integrated Framework for Geoduck Management					✔	✔	✔				
Islands Trust Conservancy Regional Conservation Plan 2018-2027	✔	✔	✔	✔	✔	✔	✔	✔	✔		✔
K'ómoks First Nation Comprehensive Community Plan	✔	✔								✔	✔
K'ómoks Marine Use Plan				✔	✔	✔	✔	✔	✔	✔	✔
Management Plan for the Great Blue Heron fannini subspecies (Ardea herodias fannini) in Canada [Proposed]		✔			✔						
Management Plan for the Peregrine Falcon pealei subspecies (Falco peregrinus pealei) in Canada		✔				✔					
Management Plan for the Steller Sea Lion (Eumetopias jubatus) in Canada		✔				✔					
Puntledge River Watershed Action Plan								✔		✔	✔
Recovery Strategy for the Marbled Murrelet (Brachyramphus marmoratus) in Canada		✔				✔					
Regional Growth Strategy – Shaping our Future (Nanaimo)	✔	✔	✔	✔	✔	✔					✔
Rural Comox Valley Official Community Plan	✔	✔	✔	✔	✔	✔		✔		✔	✔
Shellfish Integrated Management of Aquaculture Plan				✔	✔	✔	✔				
TOTAL	13	19	12	13	22	19	9	10	5	9	23

TEMPORAL

Plan	Definitive Time Scale	Indefinte Time Scale	Subject to Review	Phased targets	Outdated (*only with definitive time)	Not implemented
Baynes Sound Coastal Plan for Shellfish Aquaculture		✔	✔	✔		✔
Baynes Sound/Lambert Channel-Hornby Island Waters Important Bird Areas Conservation Plan		✔				
Boyle Point Provincial Park Master Plan		✔				
British Columbia and The Nature Trust Joint Conservation Land Management Program (West Coast)	✔			✔		
Comox Valley Regional Growth Strategy	✔			✔		
Comox Valley Sustainability Strategy	✔			✔		
Courtenay River Estuary Management Plan		✔	✔			
Denman Island Official Community Plan		✔	✔			
Electoral Area 'H' Official Community Plan (Nanaimo)	✔		✔	✔		
Fillongley, Tribune Bay, Helliwell and Sandy Island Provincial Parks Master Park Plan		✔				
Growing Our Future Together – Regional District of Nanaimo Agriculture Area Plan	✔		✔	✔		
Helliwell Provincial Park Ecosystem Based Plan		✔				
Hornby Island Official Community Plan		✔	✔			
Integrated Fisheries Management Plan for Geoduck and Horse Clam (Pacific Region)	✔					
Integrated Fisheries Management Plan for Intertidal Clams (Pacific Region)	✔					

Plan	Definitive Time Scale [1]	Indefinte Time Scale	Subject to Review	Phased targets	Outdated (*only with definitive time)	Not implemented
Integrated Fisheries Management Plan for Roe Herring (Pacific Region)	✔				✔	
Integrated Fisheries Management Plan for Salmon in Southern B.C	✔					
Integrated Framework for Geoduck Management			✔			
Islands Trust Conservancy Regional Conservation Plan 2018-2027	✔		✔			
K'ómoks First Nation Comprehensive Community Plan	✔		✔			
K'ómoks Marine Use Plan		✔	✔			
Management Plan for the Great Blue Heron fannini subspecies (Ardea herodias fannini) in Canada [Proposed]		✔	✔	✔		
Management Plan for the Peregrine Falcon pealei subspecies (Falco peregrinus pealei) in Canada		✔	✔			
Management Plan for the Steller Sea Lion (Eumetopias jubatus) in Canada		✔	✔	✔		
Puntledge River Watershed Action Plan	✔					
Recovery Strategy for the Marbled Murrelet (Brachyramphus marmoratus) in Canada		✔	✔	✔		
Regional Growth Strategy – Shaping our Future (Nanaimo)	✔		✔			
Rural Comox Valley Official Community Plan	✔		✔			
Shellfish Integrated Management of Aquaculture Plan		✔	✔			
TOTAL	14	15	17	9	1	1

HUMAN ACTIVITY Plan	Aquaculture	Fisheries	Tourism and Rec	Coastal development (industrial and urban development)	Terrestrial resource (mining, forest and agriculture)	Water quality mgmt	Marine Transportaton	Traditional Use
Baynes Sound Coastal Plan for Shellfish Aquaculture	✔							✔
Baynes Sound/Lambert Channel-Hornby Island Waters Important Bird Areas Conservation Plan	✔					✔		
Boyle Point Provincial Park Master Plan			✔					
British Columbia and The Nature Trust Joint Conservation Land Management Program (West Coast)					✔			✔
Comox Valley Regional Growth Strategy	✔		✔	✔	✔	✔	✔	✔
Comox Valley Sustainability Strategy	✔			✔	✔	✔	✔	
Courtenay River Estuary Management Plan			✔	✔	✔	✔	✔	
Denman Island Official Community Plan	✔		✔	✔	✔	✔	✔	
Electoral Area 'H' Official Community Plan (Nanaimo)			✔	✔	✔	✔	✔	✔
Fillongley, Tribune Bay, Helliwell and Sandy Island Provincial Parks Master Park Plan			✔					
Growing Our Future Together – Regional District of Nanaimo Agriculture Area Plan	✔		✔		✔	✔		
Helliwell Provincial Park Ecosystem Based Plan			✔					✔
Hornby Island Official Community Plan	✔		✔	✔	✔	✔	✔	
Integrated Fisheries Management Plan for Geoduck and Horse Clam (Pacific Region)		✔						✔
Integrated Fisheries Management Plan for Intertidal Clams (Pacific Region)		✔						✔

Plan	Aquaculture	Fisheries	Tourism and Rec	Coastal development (industrial and urban development)	Terrestrial resource (mining, forest and agriculture)	Water quality mgmt	Marine Transportaton	Traditional Use
Integrated Fisheries Management Plan for Roe Herring (Pacific Region)		✔						✔
Integrated Fisheries Management Plan for Salmon in Southern B.C		✔						✔
Integrated Framework for Geoduck Management	✔	✔						✔
Islands Trust Conservancy Regional Conservation Plan 2018-2027								✔
K'ómoks First Nation Comprehensive Community Plan							✔	✔
K'ómoks Marine Use Plan	✔	✔	✔		✔	✔	✔	✔
Management Plan for the Great Blue Heron fannini subspecies (Ardea herodias fannini) in Canada [Proposed]								
Management Plan for the Peregrine Falcon pealei subspecies (Falco peregrinus pealei) in Canada								
Management Plan for the Steller Sea Lion (Eumetopias jubatus) in Canada								✔
Puntledge River Watershed Action Plan								✔
Recovery Strategy for the Marbled Murrelet (Brachyramphus marmoratus) in Canada								
Regional Growth Strategy – Shaping our Future (Nanaimo)	✔		✔	✔	✔	✔		
Rural Comox Valley Official Community Plan	✔		✔	✔	✔	✔		
Shellfish Integrated Management of Aquaculture Plan	✔							✔
TOTAL	12	6	12	8	11	11	8	16

SPECIES Plan	Birds	Marine Mammals	Fish	Invertebrates	Marine Plant	At Risk Species	Six-Gilled Sharks
Baynes Sound Coastal Plan for Shellfish Aquaculture	✔	✔	✔	✔	✔	✔	
Baynes Sound/Lambert Channel-Hornby Island Waters Important Bird Areas Conservation Plan	✔				✔	✔	✔
Boyle Point Provincial Park Master Plan							
British Columbia and The Nature Trust Joint Conservation Land Management Program (West Coast)			✔	✔			
Comox Valley Regional Growth Strategy							
Comox Valley Sustainability Strategy							
Courtenay River Estuary Management Plan							
Denman Island Official Community Plan	✔		✔		✔		✔
Electoral Area 'H' Official Community Plan (Nanaimo)	✔						
Fillongley, Tribune Bay, Helliwell and Sandy Island Provincial Parks Master Park Plan					✔	✔	
Growing Our Future Together – Regional District of Nanaimo Agriculture Area Plan							
Helliwell Provincial Park Ecosystem Based Plan	✔	✔	✔	✔		✔	✔
Hornby Island Official Community Plan	✔					✔	✔
Integrated Fisheries Management Plan for Geoduck and Horse Clam (Pacific Region)		✔		✔	✔	✔	
Integrated Fisheries Management Plan for Intertidal Clams (Pacific Region)				✔			

Plan	Birds	Marine Mammals	Fish	Invertebrates	Marine Plant	At Risk Species	Six-Gilled Sharks
Integrated Fisheries Management Plan for Roe Herring (Pacific Region)			✔		✔	✔	
Integrated Fisheries Management Plan for Salmon in Southern B.C			✔			✔	
Integrated Framework for Geoduck Management				✔	✔		
Islands Trust Conservancy Regional Conservation Plan 2018-2027					✔	✔	
K'ómoks First Nation Comprehensive Community Plan	✔						
K'ómoks Marine Use Plan		✔			✔		✔
Management Plan for the Great Blue Heron fannini subspecies (Ardea herodias fannini) in Canada [Proposed]	✔				✔	✔	
Management Plan for the Peregrine Falcon pealei subspecies (Falco peregrinus pealei) in Canada	✔					✔	
Management Plan for the Steller Sea Lion (Eumetopias jubatus) in Canada		✔				✔	
Puntledge River Watershed Action Plan			✔			✔	
Recovery Strategy for the Marbled Murrelet (Brachyramphus marmoratus) in Canada	✔					✔	
Regional Growth Strategy – Shaping our Future (Nanaimo)							
Rural Comox Valley Official Community Plan	✔						
Shellfish Integrated Management of Aquaculture Plan				1	1		
TOTAL	11	5	7	7	11	14	5

ECOSYSTEM

Plan	EBM Approach	Elements of EBM
Baynes Sound Coastal Plan for Shellfish Aquaculture		✔
Baynes Sound/Lambert Channel-Hornby Island Waters Important Bird Areas Conservation Plan		✔
Boyle Point Provincial Park Master Plan		✔
British Columbia and The Nature Trust Joint Conservation Land Management Program (West Coast)		✔
Comox Valley Regional Growth Strategy		✔
Comox Valley Sustainability Strategy		✔
Courtenay River Estuary Management Plan	✔	✔
Denman Island Official Community Plan		✔
Electoral Area 'H' Official Community Plan (Nanaimo)		✔
Fillongley, Tribune Bay, Helliwell and Sandy Island Provincial Parks Master Park Plan		✔
Growing Our Future Together – Regional District of Nanaimo Agriculture Area Plan		
Helliwell Provincial Park Ecosystem Based Plan	✔	✔
Hornby Island Official Community Plan		✔
Integrated Fisheries Management Plan for Geoduck and Horse Clam (Pacific Region)	✔	✔
Integrated Fisheries Management Plan for Intertidal Clams (Pacific Region)	✔	✔
Integrated Fisheries Management Plan for Roe Herring (Pacific Region)	✔	✔
Integrated Fisheries Management Plan for Salmon in Southern B.C	✔	✔
Integrated Framework for Geoduck Management		✔
Islands Trust Conservancy Regional Conservation Plan 2018-2027		✔
K'ómoks First Nation Comprehensive Community Plan		
K'ómoks Marine Use Plan	✔	✔
Management Plan for the Great Blue Heron fannini subspecies (Ardea herodias fannini) in Canada [Proposed]		✔
Management Plan for the Peregrine Falcon pealei subspecies (Falco peregrinus pealei) in Canada		✔
Management Plan for the Steller Sea Lion (Eumetopias jubatus) in Canada		✔
Puntledge River Watershed Action Plan		✔
Recovery Strategy for the Marbled Murrelet (Brachyramphus marmoratus) in Canada		✔
Regional Growth Strategy – Shaping our Future (Nanaimo)		✔
Rural Comox Valley Official Community Plan		✔
Shellfish Integrated Management of Aquaculture Plan	✔	✔
TOTAL	8	27