

DRAFT

**Canada – British Columbia
Marine Protected Area
Network Strategy**

A Joint Initiative of the Governments of
Canada and British Columbia.

Canada



Preface

The governments of Canada and British Columbia are pleased to present this draft *Canada – BC Marine Protected Area Network Strategy*. Pacific Canada is one of the most diverse and productive marine environments in the world - we rely on it in many ways, as a source of food, employment, recreation and spiritual renewal. We want to build on and protect this richness for present and future generations.

This draft strategy has been developed jointly by federal and provincial agencies and reflects the need for governments to work together to achieve common marine protection and conservation goals. This strategy is an initiative to coordinate all existing federal and provincial marine protected areas programs under a single umbrella. This allows for better integration with the national framework for a marine protected area network in Canada and provides an overarching vision and guiding objectives for Pacific Canada's marine protected areas.

To date however, this draft does not reflect feedback from First Nations, local governments, community, stakeholder or industry perspectives. We now want to provide an opportunity to review and comment on this draft strategy.

Table of Contents

| | |
|---|----|
| Preface | 2 |
| Introduction | 5 |
| Why Create a Canada-British Columbia Marine Protected Area Network Strategy? | 6 |
| Definitions | 7 |
| Marine Protected Area | 7 |
| Marine Protected Area Network | 7 |
| Vision, Goals and Objectives for a Network of MPAs on the Pacific Coast of Canada | 7 |
| Vision | 8 |
| Goals | 8 |
| Objectives | 8 |
| Developing a Network of Marine Protected Areas | 11 |
| General Operating Principles | 11 |
| Ecological Network Design Principles | 12 |
| Social, Economic & Cultural Network Design Principles | 14 |
| Governance | 14 |
| Moving Forward | 15 |
| Endnotes | 25 |

Figures

| | |
|---|----|
| Figure 1: Relationship Between MPA Network Goals and Objectives | 8 |
| Figure 2: Potential Phases and Key Components of an MPA Strategy | |
| Implementation Process | 15 |
| Figure 3: Map of Existing Federal and Provincial Protected Areas in the | |
| Marine Environment | 20 |
| Figure 4: Pacific Region Federal-Provincial Governance Structures with an Ocean | |
| Management Mandate | 23 |

Tables

| | |
|--|----|
| Table 1: MPA Types, Number and Percent Area | 18 |
| Table 2: Length and Percent of Intertidal Shoreline Inside MPAs | 19 |
| Table 3: Summary of Pacific Federal-Provincial Governance Structures with an Ocean Management Mandate | 24 |

Appendices

| | |
|---|----|
| Appendix 1: Marine Ecosystem Stressors in the North East Pacific | 16 |
| Appendix 2: State of Pacific Canada MPAs | 18 |
| Appendix 3: Protected Area Legislation in Pacific Canada | 21 |
| Appendix 4: Pacific Region Federal-Provincial MPA Governance Structures | 22 |

Introduction

1 This strategy provides a high level framework for guiding the process of establishing a network
2 of MPAs in Pacific Canada. Specific policies or activities related to the planning,
3 implementation and management of marine protected areas (MPAs) will be addressed in future
4 documents such as implementation plans.

5 On September 18, 2004, the governments of British Columbia and Canada signed a
6 *Memorandum of Understanding between Canada and British Columbia Respecting the*
7 *Implementation of Canada's Oceans Strategy on the Pacific Coast of Canada*. The purpose of
8 the MoU is to "provide for further collaboration among the parties to advance the
9 implementation of specific activities and objectives identified in Canada's Oceans Strategy
10 aimed at Understanding and Protecting the Marine Environment and supporting Sustainable
11 Economic Opportunities on the Pacific Coast of Canada". In addition, implementation of the
12 Federal *Oceans Act*¹ directs multi-agency collaboration and coordination on broad oceans
13 management, including MPAs.

14 The purpose of this strategy is to provide guidance for the design of a network of MPAs on the
15 Pacific Coast of Canada to help achieve the objectives outlined in the 2004 Memorandum of
16 Understanding. It provides background information and context, and outlines the vision, goals
17 and objectives of the Pacific MPA Network to help guide MPA establishment and regional
18 planning initiatives. This strategy is informed by the 1998 discussion paper on a network of
19 MPAs for Canada's Pacific Coast² and by a draft *Framework for Canada's National Network of*
20 *Marine Protected Areas*, a national guidance document that presents the intended approach of
21 federal, provincial and territorial government to MPA network design.

22 The process set out in this strategy is meant to build collaboration and partnerships and is not
23 intended to fetter the statutory responsibility or authority, nor the interests and obligations of
24 any governments to establish or manage such areas.

25 This Strategy proposes two important elements:

- 26 1. **A joint federal-provincial approach:** All relevant federal and provincial agencies will
27 work collaboratively to exercise their authorities to protect marine areas.
- 28 2. **Collaborative decision-making:** Government agencies will employ a collaborative
29 decision-making process with First Nations, marine stakeholders, coastal communities
30 and the public.

31 **Why Create a Canada – British Columbia Marine Protected Area** 32 **Network Strategy?**

33 With approximately 36,000 km of shoreline³, 6,500 islands and over 450,000 sq. km of internal
34 and offshore marine waters, Pacific Canada is host to a multitude of ecological, social, cultural
35 and economic values. BC's coastal and marine waters are among the most biologically
36 productive in the world and continue to generate tremendous wealth for British Columbians
37 and Canadians^{4,5}.

38 A principal driver behind establishing a network of MPAs is to protect and conserve the natural
39 beauty, diversity of species and ecosystems and culture of our ocean and coastal areas, and to
40 help facilitate the sustainable use of our ocean resources. Sustainability of the world's oceans
41 is increasingly becoming a critical concern to coastal nations, and the need to mitigate the
42 impact of a multitude of stressors to our marine environments is becoming more urgent
43 (Appendix 1). Several countries, coastal states and provinces have recognized the importance
44 of MPAs and have established networks of MPAs⁶. Decades of scientific evidence documenting
45 ecological, social and/or economic benefits of MPAs demonstrates that MPAs and MPA
46 networks are effective management tools^{7,8,9,10}.

47 Stressors on the marine environment are fueling the desire to establish a comprehensive
48 network of MPAs along the Pacific coast of Canada as one essential tool to address the needs of
49 our oceans. Globally, not only have MPAs demonstrated positive ecological gains¹¹, but they
50 have also been shown to provide a venue for ocean users to have a voice in ocean
51 management¹².

52 Marine protected areas are a well established type of management designation in Pacific
53 Canada. British Columbia's first MPA was designated in 1911 (as part of Strathcona Provincial
54 Park) for the protection of marine values, and BC currently has a total of 187 MPAs covering
55 28% of BC's coastline and 2.8 percent Pacific Canada's Exclusive Economic Zone (EEZ)¹³
56 (Appendix 2). These MPAs were designated using a variety of federal and provincial legislative
57 tools, however a network approach will enhance their capacity to achieve multiple goals and
58 objectives that no one single MPA could achieve⁹.

59 The general benefits of marine protected areas are many, and may include^{14,15,16}:

- 60 • Contributing to the protection of the structure, function and integrity of ecosystems;
- 61 • Encouraging expansion of our knowledge and understanding of marine systems;
- 62 • Ensuring a suitable resource base for non-consumptive and sustainable consumptive
63 activities including recreation and tourism;
- 64 • Contributing to the coordination of ecosystem-based management of marine
65 activities thereby ensuring long-term economic opportunities for sustainable use.

- 66 • Providing researchers and policy makers with reference sites to serve as natural
67 benchmarks;
- 68 • Providing an inclusive and place-based approach to planning and managing marine
69 resources;
- 70 • Increasing the quality of life in surrounding communities; and
- 71 • Protecting culturally and spiritually significant sites

72 **Definitions**

73 Between Canada and British Columbia, there are several marine protected area (MPA)
74 designation types (Appendix 3) providing for a diversity of MPA network options. However,
75 definitions for a “marine protected area” and a “marine protected area network” have been
76 identified in the draft *National Framework for Canada’s Network of Marine Protected Areas*,
77 and will be adopted in British Columbia for consistency.

78 **Marine Protected Area:**

79 **“A clearly defined geographical space recognized, dedicated, and managed, through**
80 **legal or other effective means, to achieve the long-term conservation of nature with**
81 **associated ecosystem services and cultural values”.** (Adopted from the definition
82 provided by the World Conservation Union’s World Commission on Protected Areas
83 (IUCN/WCPA) in 2008.)
84

85 **Marine Protected Area Network:**

86 **“A collection of individual marine protected areas that operates cooperatively and**
87 **synergistically, at various spatial scales, and with a range of protection levels, in order to**
88 **fulfill ecological aims more effectively and comprehensively than individual sites could**
89 **alone.”** (Adopted from: WCPA/IUCN. 2007. *Establishing networks of marine protected*
90 *areas: A guide for developing national and regional capacity for building MPA networks.*
91 *Non-technical summary report.*)

92 **Vision, Goals and Objectives for a Network of Marine Protected Areas** 93 **on the Pacific Coast of Canada**

94 MPAs are an important conservation tool that, when used in conjunction with other
95 management applications, can result in benefits for coastal communities and regional and
96 national economies.

97 The vision, goals and objectives of this strategy will help British Columbia realize a future that
98 includes the establishment of a network of MPAs through cooperative and integrated
99 processes.

100 **Vision**

101 The vision for British Columbia’s network of marine protected areas is:

102 An ecologically comprehensive, resilient, and representative national network of marine
103 protected areas that protects the biological diversity and health of the marine environment
104 for present and future generations.

105 **Goals**

106 Goals for Pacific, Arctic and Atlantic MPA networks have been set nationally through the draft
107 *Framework for Canada’s National Network of Marine Protected Areas* and provide national
108 consistency in network planning. They are:

- 109 1. To protect marine biodiversity, ecosystem function and special natural features.
- 110 2. To support the conservation and management of Canada’s living marine resources and
111 their habitats, and the socio-economic values and ecosystem services they provide.
- 112 3. To enhance public awareness and appreciation of Canada’s marine environments and
113 rich maritime history and culture.

114 **Objectives**

115 Six overarching objectives have been identified to meet the goals and contribute to the vision
116 for a MPA network for Pacific Canada. Setting clear, measureable objectives is important for
117 gauging successful MPA network design. Figure 1 illustrates the relationship between the
118 National Framework’s stated goals and the MPA network objectives for Pacific Canada.

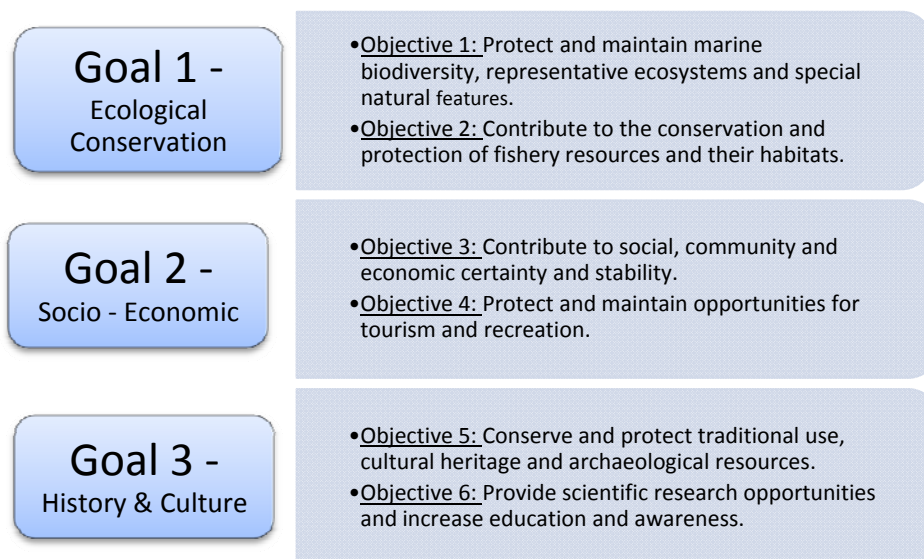


Figure 1. Relationship between MPA network goals and objectives

119 **OBJECTIVE 1: PROTECT AND MAINTAIN MARINE BIODIVERSITY, REPRESENTATIVE**
120 **ECOSYSTEMS AND SPECIAL NATURAL FEATURES**

121 MPAs can contribute to the maintenance of biodiversity at all levels of the ecosystem, as well as
122 protect food web relationships and ecological processes. They give refuge to vulnerable species
123 thus helping to maintain species presence, age, size distribution and abundance; they protect
124 endangered or threatened species, preventing species loss; and they preserve the natural
125 composition and special natural features of the marine community.

126 **Biodiversity** is the variability among living organisms and the living complexes of which they
127 are a part. It is expressed in the genetic variability within a species (such as different stocks
128 of the same species), in the number of different species, and in the variety of ecosystems
129 and habitats along the coast.

130 **Representative Ecosystems** - samples of all ecosystems within the protected area network,
131 at a sufficient scale to ensure their long term persistence¹⁷, is internationally recognized as
132 key to ensuring basic protection for biodiversity. Biogeographic regions have been
133 identified for Pacific Canada through the use of ecological classification systems¹⁸. These
134 will help guide the planning of the network of MPAs to ensure it is highly representative of
135 the diverse array of marine environments.

136 **Special Natural Features** are elements of the environment that are rare, outstanding or
137 unique. These areas may include stopover sites for certain migrating species, seabird
138 colonies and their surrounding waters, areas with rare and unique capabilities for
139 maintaining early-life stages of important fish and shellfish species, habitats for marine
140 species at risk and habitats of high biodiversity, such as estuaries or upwelling areas. While
141 many of these elements may be captured within large, representative MPAs, it is also
142 necessary to specifically identify and protect special, and often site-specific, features.

143 **OBJECTIVE 2: TO CONTRIBUTE TO THE CONSERVATION AND PROTECTION OF FISHERY**
144 **RESOURCES AND THEIR HABITATS**

145 Conserving and protecting fish stocks is critical for the sustainability and stability of BC's
146 commercial fisheries and many coastal communities because economic, social and cultural
147 values flow from healthy and productive marine ecosystems.

148 MPAs can help maintain viable marine species populations and support the continuation of
149 sustainable fisheries by:

- 150 • providing harvest refugia;
- 151 • protecting habitats, especially those critical to lifecycle stages such as spawning,
152 juvenile rearing and feeding;
- 153 • protecting spawning stocks, spawning stock biomass and spawning aggregations to
154 enhance or maintain reproductive capacity;

- 155 • contributing to the restoration and recovery of species, habitat, and ecosystems;
- 156 • enhancing local and regional fish stocks through increased recruitment and spillover
- 157 of adults and juveniles into adjacent areas;
- 158 • assisting in conservation-based fisheries management regimes; and
- 159 • providing opportunities for scientific research

160 **OBJECTIVE 3: CONTRIBUTE TO SOCIAL, COMMUNITY AND ECONOMIC CERTAINTY AND**
161 **STABILITY**

162 This MPA network strategy clarifies our direction for marine conservation and the role MPAs
163 will have. The strategy and the subsequent implementation plans will guide recommendations
164 for levels of access and will provide a clearer vision of long term potential access and
165 restrictions to marine resources. Effective MPA network implementation plans will provide
166 certainty for access for a variety of human activities and values including renewable and non-
167 renewable resource exploration/development. Resilient and healthy ecosystems also
168 contribute to certainty and stability by supporting sustainable industries, local economies and
169 coastal communities.

170 **OBJECTIVE 4: PROTECT AND MAINTAIN OPPORTUNITIES FOR TOURISM AND**
171 **RECREATION**

172 MPAs can support marine and coastal outdoor recreation and tourism, as well as the pursuit of
173 activities of a spiritual or aesthetic nature. The protection of representative ecosystems and
174 special recreation features will help to secure the wealth and range of recreational and tourism
175 opportunities. Protection of these features can provide significant new economic opportunities
176 for coastal communities.

177 **OBJECTIVE 5: CONSERVE AND PROTECT TRADITIONAL USE, CULTURAL HERITAGE AND**
178 **ARCHAEOLOGICAL RESOURCES**

179 Cultural resources are works of human origin, places that provide evidence of human activity or
180 occupation, or areas with spiritual or cultural value. MPAs can be developed to conserve and
181 protect marine areas with spiritual or cultural heritage value such as archaeological sites,
182 shipwrecks, and areas traditionally used by Aboriginal and non-aboriginal communities.
183 Recreation, tourism and education activities that are consistent with the objectives of a
184 protected area may be permitted, improving public awareness, understanding and appreciation
185 of Canada's marine heritage.

186 **OBJECTIVE 6: PROVIDE SCIENTIFIC RESEARCH OPPORTUNITIES AND INCREASE**
187 **EDUCATION AND AWARENESS**

188 Scientific knowledge of the marine environment lags significantly behind that for the terrestrial
189 environment which can affect the ability of marine managers to identify the merits of
190 protection or management options. MPAs provide increased opportunities for scientific
191 research on topics such as species population dynamics, ecology and marine ecosystem
192 structure and function, as well as provide opportunities for sharing traditional knowledge.

193 There is general recognition that proactive measures are necessary to protect and conserve
194 marine areas to sustain their resources for present and future generations. However, there is
195 still a significant need for public education to instill greater awareness of the role everyone can
196 play in the conservation of marine environments. Many MPAs will afford unique opportunities
197 for public education because of their accessibility and potential to clearly demonstrate marine
198 ecological principles and values.

199 **Developing a Network of Marine Protected Areas**

200 **GENERAL OPERATING PRINCIPLES¹⁹**

201 The MPA network is intended to contribute to sustainability in our marine environments. Both
202 governments recognize that balancing environmental, socioeconomic, cultural and spiritual
203 implications of MPA establishment will be key to achieving a sustainable network. To that end,
204 the principles that will guide the development of the MPA network are ecological, economic,
205 social and cultural in nature. These principles are a selection of national and international best
206 practices, including principles that have been developed through a joint Canada – British
207 Columbia initiative and United Nations international conference on environment and
208 development.

209 WORKING WITH PEOPLE

210 A consultative process that is balanced, open, inclusive, transparent, and provides
211 opportunities for meaningful involvement will be used to develop Pacific Canada's MPA
212 network. Federal and provincial government partners will work with First Nations, coastal
213 communities, marine stakeholders and the public on MPA identification, establishment and
214 management. Government agencies responsible for implementation will coordinate their
215 efforts and ensure that information and analysis is transparent and accessible.

216 RESPECTING FIRST NATIONS, THE TREATY PROCESS, TITLE, ASPIRATIONS AND WORLD-VIEW

217 First Nations' support and participation in the MPA Strategy is important and an integral part of
218 its success. Both governments will respect the continued use of MPAs by First Nations for food,
219 social and ceremonial purposes and other traditional practices. The establishment of any MPA
220 will not preclude options for future negotiations or agreements, and will seek to address
221 opportunities for First Nations to benefit from MPAs.

222 ADAPTIVE MANAGEMENT

223 Including adaptive strategies in the MPA network design allow for adjustments as science
224 evolves and the dynamics of the marine environment change.

225 Both governments recognize that the process for MPA planning should evolve and improve
226 over time, responding to variations between coastal regions, changing dynamics of the marine
227 environment and human activities, and improvements in scientific understanding. Flexibility
228 and adaptability will be required to effectively and efficiently consider the interests of all
229 marine resource users. MPA network management will routinely evaluate and report on the
230 design, management and effectiveness of the MPA network.

231 BUILD ON EXISTING MPAS, OTHER PROTECTED AREAS AND MARINE CONSERVATION PLANNING
232 INITIATIVES

233 The MPA network will integrate with and support broader conservation measures and
234 management objectives being applied in adjacent marine and terrestrial areas. Both
235 governments will seek opportunities to capitalize on existing federal and provincial MPAs and
236 other spatially defined conservation measures (e.g. fisheries closures) to achieve MPA network
237 objectives. A variety of protection measures will be applied within the network to ensure
238 protection is consistent with the objectives of each site.

239 TAKING A PRECAUTIONARY APPROACH

240 The RIO Declaration states that a “ lack of scientific certainty should not be used as a reason for
241 postponing cost effective preventative measures against potential serious damage to the
242 marine environment”²⁰ The RIO Declaration supports the position that a lack of scientific
243 certainty should not preclude planning the MPA network. In the context of the Pacific Region,
244 MPAs will be one tool to help mitigate the effects of stressors on the marine environment. For
245 example, our scientific knowledge of Pacific Canada’s offshore environments is incomplete but
246 should not stall MPA network establishment; making adjustments and filling in gaps as more
247 information becomes available.

248 **ECOLOGICAL NETWORK DESIGN PRINCIPLES**²¹

249 INCLUDE THE FULL RANGE OF BIODIVERSITY PRESENT IN PACIFIC CANADA

250 **Representation** – Represent a minimum of each definable habitat types in the overall MPA
251 network. For example, this could mean a particular rocky reef habitat, eelgrass meadow,
252 intertidal mudflat or representation within a hierarchy of ecological scales (e.g, representation
253 of rocky reefs within a broader biogeographic classification).

254 **Replication** – Have sufficient replication of habitat types to safeguard against catastrophic
255 events or disturbances.

256 **Representation of resilient and resistant characteristics** – Choose sites that are more likely to
257 be resistant (i.e., sites that do not change after a disturbance) or resilient (i.e., sites that are

258 able to return to their original state, and the rate to which they do so, following a disturbance)
259 to climate change.

260 ENSURE ECOLOGICALLY SIGNIFICANT AREAS ARE INCORPORATED

261 **Protection of Unique or Vulnerable Habitats** – Design network to include biophysically special
262 and unique places.

263 **Protection of Foraging or Breeding Grounds** – Design network to include important areas for
264 breeding, feeding or areas of high aggregation.

265 **Protection of Source Populations** – Design network to include important sources of
266 reproduction (e.g. nurseries, spawning areas, egg sources, etc).

267 ENSURE ECOLOGICAL LINKAGES

268 **Connectivity** – Ensure ecological pathways (i.e., dispersal and home ranges of marine
269 organisms) and the distribution of marine habitats, over space and time, are considered in the
270 development of network replication and the spacing of MPA sites.

271 MAINTAIN LONG-TERM PROTECTION

272 Economic, ecological and social benefits of MPA networks may be realized in a few seasons – or
273 may take several decades. Therefore, effective management measures should be implemented
274 over long time scales for effective protection.

275 Effective long-term protection may require the employment of several measures including
276 permanent prohibitions; restrictions adapted to seasons, lifecycles, human activities or changes
277 in information about the area as well as engagement of local users for compliance and
278 enforcement.

279 ENSURE MAXIMUM CONTRIBUTION OF INDIVIDUAL MPAS

280 **Size** –Design individual MPAs to include sufficient area to meet the related site objectives and
281 effectively contribute to network objectives over the long term.

282 **Spacing** – Design the network of MPAs to reflect the spacing of habitats, cover the geographic
283 range of habitats and facilitate ecological connectivity between sites.

284 **Shape** – Design the shape of individual MPAs to the degree possible to: 1) follow ecologically
285 boundaries; 2) avoid fragmenting cohesive habitats; and, 3) facilitate surveillance and
286 enforcement.

287 **SOCIAL, ECONOMIC & CULTURAL NETWORK DESIGN PRINCIPLES**

288 Designing MPA networks is more than a conservation issue. A successful network design will
289 incorporate socioeconomic principles and recognize the fundamental relationship between the
290 environment and human activities, values and culture. Understanding the intensity and pattern
291 of human use and values can aid in designing strategies that will achieve network objectives
292 and maintain them in the long term.

293 RECOGNIZE AND CONSIDER THE SOCIOECONOMIC, CULTURAL AND SPIRITUAL IMPLICATIONS 294 OF MPA ESTABLISHMENT

295 The localized effects of MPA establishment can vary by across a variety of marine sectors, as
296 can cultural and spiritual values. The processes behind MPA site selection and network design
297 must reflect these differences and adapt as appropriate.

298 MAXIMIZE SOCIOECONOMIC, CULTURAL AND SPIRITUAL BENEFITS

299 Where appropriate, MPA network design should take advantage of opportunities to contribute
300 positively to sustainable socioeconomic activities, and cultural and spiritual values. For
301 example, network design may consider recreational and cultural features in site selection and
302 boundary design and strive to include patterns of recreation use (e.g., kayak routes and
303 pleasure boating) and cultural heritage (e.g., First Nations trade routes, exploration routes) in
304 network design.

305 MINIMIZE NEGATIVE SOCIO-ECONOMIC IMPACTS ON STAKEHOLDERS AND LOCAL 306 COMMUNITIES

307 Where appropriate, development of the MPA network should strive to minimize stakeholder
308 conflict and balance conservation objectives with socioeconomic opportunities. Economic
309 analyses can identify or help design measures that maximize conservation success while
310 minimizing costs. For example, network design should take advantage of available bio-
311 economic models²² and decision support tools (e.g. MARXAN²³) to support MPA site selection
312 and network establishment in order to reduce potential conflicts / impacts with stakeholders
313 and local communities. The availability of various designation options provides additional
314 opportunity to customize the protection to the objectives and features of the area while
315 minimizing impact on human activities.

316 ENHANCE MANAGEMENT EFFECTIVENESS AND COMPLIANCE TO MAXIMIZE BENEFITS AND 317 MINIMIZE COSTS

318 Work with the appropriate government bodies, First Nations and local authorities to solidify
319 partnerships and seek out cost effective measures to appropriately manage regional MPA sites.

320 **Governance**

321 Central to this strategy are existing governance structures that are in place to support the
322 establishment of a network of marine protected areas. Existing First Nations, local, provincial or
323 federal integrated ocean and/or coastal management processes or marine spatial planning

324 initiatives can serve as a venue for discussions and/or recommendations related to the planning
325 and management of MPAs.

326 Governance in the context of MPA network planning is about effective ways of continuously
327 engaging various levels and branches of government with mandates that concern marine
328 issues, as well as sectors of society with an interest in marine management. Several federal and
329 provincial coordinating bodies already exist, and provide expertise and strategic input to MPA
330 establishment for Pacific Canada (Appendix 4). Collectively, these bodies serve as a governance
331 framework that supports MPA network establishment and implementation.

332 **Moving Forward...**

333 Following input into this strategy, implementation plans may be developed in collaboration
334 with the Federal-Provincial Marine Protected Area Implementation Team Science Working
335 Group and Socio-Economic Working Group. These plans would include the necessary tools and
336 methods required to undertake an implementation process that would occur through four
337 proposed phases. Figure 2 outlines some of the important sub-steps in each phase; however it
338 is not an exhaustive list. These phases do not strictly occur in stepwise fashion either; in many
339 cases, there will be progress in many sub-steps at the same time. Working groups have already
340 begun on aspects of phase one and two in order to form an information base for further
341 discussion.

342 The National MPA framework will be used as guidance, where appropriate, throughout the
343 phased approach. For example, an implementation plan could include the development of
344 these potential phases:

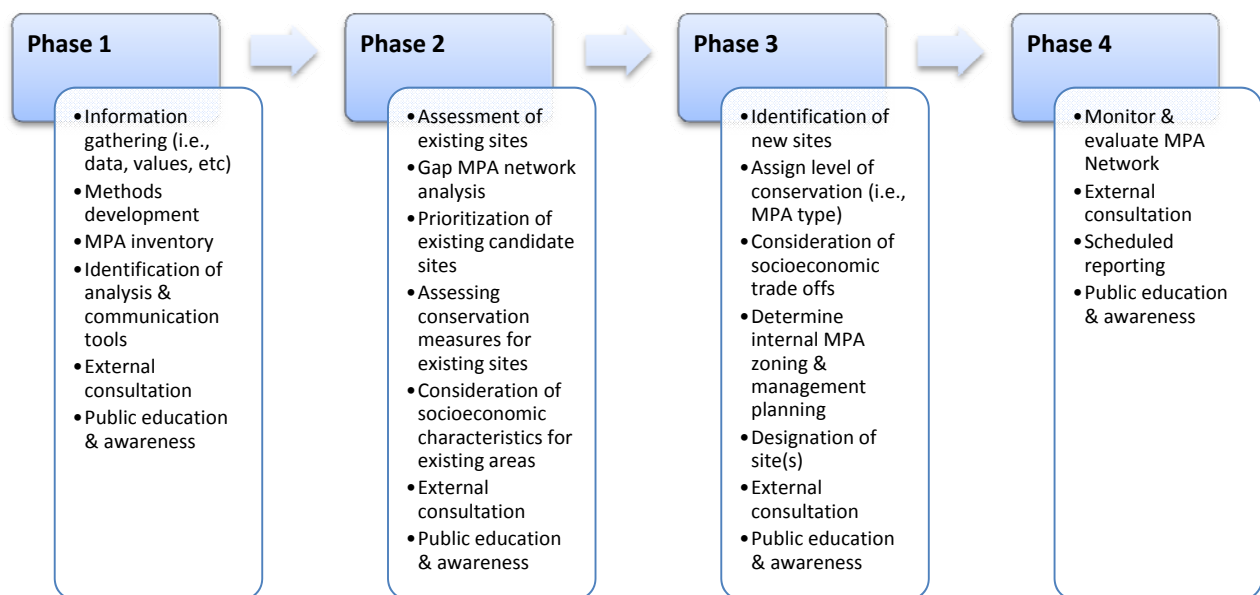


Figure 2. Potential phases, and key components of an MPA strategy implementation process.

Appendix 1 - Marine Ecosystem Stressors in the North East Pacific

345
346

347 Marine ecosystems of Pacific Canada face several challenges including habitat alteration,
348 resource use pressure, land and sea-based pollutants, invasive species, and larger scale impacts
349 related to global climate change. Cumulative effects of multiple stressors further compound the
350 need to take conservation action. Examples of marine ecosystem stressors include:

351 HABITAT ALTERATION

352 The alteration, deterioration, or degradation of habitat has a significant impact on marine
353 ecosystems. Habitats may be damaged through activities such as dredging and filling, ocean
354 dumping, log storage, resource extraction, bottom fishing, anchoring, cable laying,
355 developments, agriculture or aquaculture introductions, siltation from land based activities,
356 and altered freshwater inputs²⁰.

357 MARINE SPECIES HARVEST

358 Impacts of aquatic species harvest may include: 1) removal of a species or group of species
359 either through targeted fishing pressure or as by-catch, impacting multiple trophic levels; 2)
360 physical impacts to habitat associated with harvest techniques or gear, or anchoring of
361 vessels^{24, 25}; and 3) impacts of lost 'ghost' gear²⁶.

362 POLLUTION

363 Sources of thermal, chemical and sound pollution include sedimentation, sewage, dredging,
364 non-degradable litter (e.g. plastics), resource extraction, vessel emissions and organic
365 deposition (e.g. freshwater, agriculture or aquaculture introductions). Impacts of pollution in
366 the marine environment include habitat damage and loss²⁷, increased mortality and health
367 risks to aquatic species and bioaccumulation of toxicity in the food chain²⁸.

368 AQUATIC INVASIVE SPECIES

369 The introduction of foreign or exotic marine species may alter the composition of biological
370 communities on the Pacific coast. Intertidal and coastal areas of Pacific Canada include invasive
371 species such as tunicates and harmful marine algae. Some species were introduced at the turn
372 of the century while others are a more recent invasion, such as the northward expansion of the
373 green crab into BC's waters.

374 CLIMATE CHANGE AND OCEAN ACIDIFICATION

375 In the Strait of Georgia, sea surface temperatures have been increasing at a rate of 1°C over 90
376 years, based on lighthouse records gathered throughout southern British Columbia²⁹. Ocean
377 warming in the Pacific region may be a stressor for aquatic ecosystems through changes
378 including altered oxygen concentrations, oceanographic conditions and primary productivity.
379 Species assemblage changes may occur at multiple trophic levels, and cold water species may
380 have reduced survival or overall condition, as well as changes to habitat range or depth strata
381 that provide optimal conditions for survival.

382 In addition, a major reduction in the pH at the entrance to the Juan de Fuca Strait has recently
383 been documented³⁰. Such changes reduce the availability of carbonate for organisms to build
384 hard shells (e.g. mussels, corals and some phytoplankton)³¹. In extreme cases increases in
385 acidity may even corrode organisms' shells and skeletons³².

Appendix 2 – State of Pacific Canada MPAs

Table 1. MPA Types, Number and Percent Area

| MPA Designation | Number of MPAs | Adjacent terrestrial area protected (ha) | Marine area protected (ha) | Contribution to MPA network | Total marine area contribution |
|---|----------------|--|----------------------------|-----------------------------|--------------------------------|
| Conservancy | 58 | 922,015.86 | 141,209.36 | 11.11% | 0.31% |
| Ecological Reserve | 20 | 10,473.62 | 51,080.00 | 4.02% | 0.11% |
| Ocean Act MPA | 2 | 0 | 618,930.10 | 48.68% | 1.36% |
| National Marine Conservation Area Reserve | 1 | 147,532.56 | 346,754.69 | 27.27% | 0.76% |
| National Park | 2 | 31,924.19 | 25,541.42 | 2.01% | 0.06% |
| Provincial Protected Area | 3 | 303.66 | 24.9 | < 0.01% | < 0.01% |
| Provincial Park | 95 | 531,836.15 | 66,314.82 | 5.22% | 0.15% |
| Wildlife Management Area | 6 | 1,520.79 | 21,580.74 | 1.70% | 0.05% |
| Total: | 187 | 1,645,606.83 | 1,271,436.04 | 100.00% | 2.80% |

Note: Data are current as of the date of this draft; data do not include designations such as: Migratory Bird Sanctuaries, National Wildlife Areas, Notations of Interest, Land Reserves, Private Conservation Lands or Municipal Parks at this time.

Table 2. Length and Percent of Intertidal Shoreline Inside MPAs

| Intertidal / shoreline types | Length (km) of intertidal type in MPAs | Length (Km) of intertidal type in Province | % of intertidal types in MPAs |
|-------------------------------------|---|---|--------------------------------------|
| Channel | 15.64 | 57.94 | 26.99% |
| Estuary, Marsh or Lagoon | 554.64 | 1,836.39 | 30.20% |
| Gravel Beach | 222.82 | 1,321.73 | 16.86% |
| Gravel Flat | 60.95 | 239.81 | 25.41% |
| Man Made | 23.86 | 444.55 | 5.37% |
| Mud Flat | 21.27 | 179.54 | 11.85% |
| Rock Cliff | 2,930.41 | 11,424.93 | 25.65% |
| Rock Platform | 357.03 | 731.18 | 48.83% |
| Rock with Gravel Beach | 2,177.94 | 7,704.82 | 28.27% |
| Rock with Sand Beach | 208.22 | 522.81 | 39.83% |
| Rock, Sand and Gravel Beach | 1,788.92 | 4,978.39 | 35.93% |
| Sand Beach | 276.52 | 529.3 | 52.24% |
| Sand Flat | 619.55 | 1,700.43 | 36.43% |
| Sand and Gravel Beach | 251.09 | 1,570.18 | 15.99% |
| Sand and Gravel Flat | 493 | 2,479.75 | 19.88% |
| Total | 10,001.86 | 35,721.74 | 28.00% |

Note: Data are current as of the date of this draft; data do not include designations such as: Migratory Bird Sanctuaries, National Wildlife Areas, Notations of Interest, Land Reserves, Private Conservation Lands or Municipal Parks at this time.

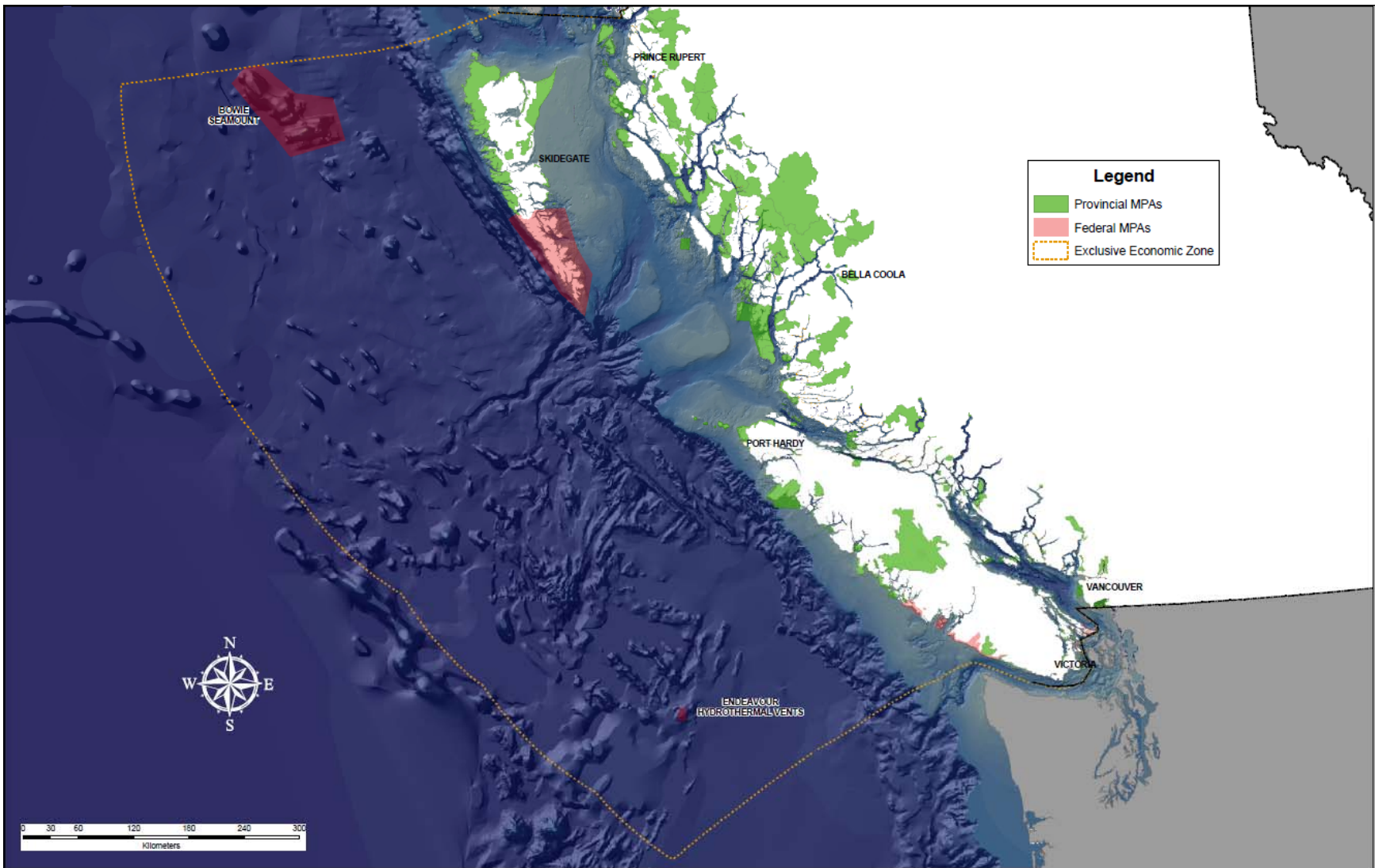


Figure 3. Map of existing Federal and Provincial protected areas in the marine environment.

Appendix 3 – Protected Area Legislation in Pacific Canada³³

FEDERAL LEGISLATION

Fisheries and Oceans Canada

- a. a “marine protected area” established under the **Oceans Act S.C.1996, c. 31**;

Parks Canada

- b. a “national marine conservation area” or “NMCA” established under the **Canada National Marine Conservation Areas Act S.C. 2002, c. 18**, and includes an NMCA reserve where there are unresolved Aboriginal rights claims that have been accepted for negotiation by the Government of Canada;
- c. a “national park” with marine components established under the **Canada National Parks Act S.C. 2000, c. 32**, and includes a national park reserve where there are unresolved Aboriginal rights claims that have been accepted for negotiation by the Government of Canada;

Environment Canada

- d. a protected marine area (known as a marine wildlife area) or “wildlife area” (known as a National Wildlife Area) established under the **Canada Wildlife Act R.S.C. 1985, c.W-9**;
- e. a “migratory bird sanctuary” established in the marine environment under the **Migratory Birds Convention Act,1994 S.C. 1994, c.22**.

GOVERNMENT OF BRITISH COLUMBIA LEGISLATION

Ministry of Environment

- a. a “provincial park”, “recreation area”, or “conservancy” established in a marine environment under the **Park Act [RSBC 1996] c. 344** or the **Protected Areas of British Columbia Act [SBC 2000] c. 17**;
- b. an “ecological reserve” established in a marine environment under the **Ecological Reserve Act [RSBC 1996] c. 103** or the **Protected Areas of British Columbia Act [SBC 2000] c. 17**;
- c. a “protected area” or “conservation study area” established in a marine environment under the **Environment and Land Use Act [RSBC 1996] c. 117**;
- d. a “wildlife management area” established in the marine environment under the **Wildlife Act [RSBC 1996] c. 488**.

Ministry of Agriculture and Lands

- e. a “land reserve” or “notation of interest” established over Crown land and water in a marine environment under the **Land Act [RSBC 1996] c. 245**;

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Appendix 4 – Pacific Region Federal-Provincial MPA Governance Structures

Extensive legislative authorities exist among the federal and provincial agencies to implement a comprehensive system of MPAs. These governance structures complement each other and represent the various sources of constitutional and legislative powers necessary to enable us to work together to achieve the objectives of the MPA Strategy.

Canada-BC governance structures in the Pacific region have been established at three levels amongst federal family departments, between federal and provincial departments and ministries, and amongst Provincial ministries (Figure 4).

This federal-provincial partnership is essential since jurisdictional responsibilities in the marine environment are shared. For example, in all internal waters and the area between the “jaws of the land”, the seabed is under provincial jurisdiction, whereas in offshore areas it is under federal care. Throughout the marine environment, the organisms (i.e., marine fishes) in the water column are under federal jurisdiction. However, the management of certain resources, commercial harvest of oysters and kelp, is under the purview of the provincial government. Keeping this in mind, in some circumstances dual designation of an MPA using both federal and provincial legislative authorities may be required. For instance, some provincial parks and ecological reserves may need the added protection provided by an MPA under the *Oceans Act* to achieve their management objectives.

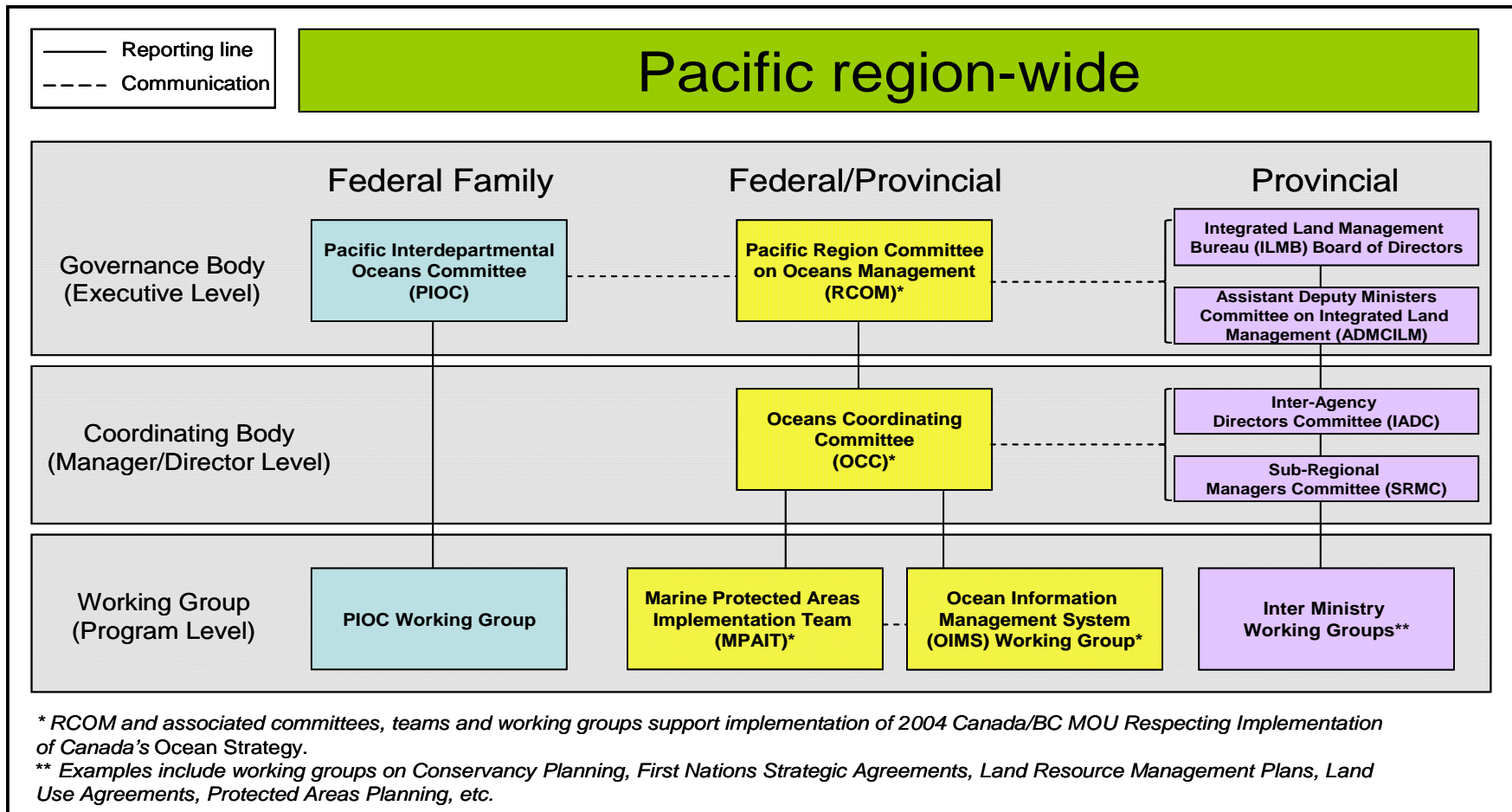


Figure 4. Pacific region federal-provincial governance structures with an ocean management mandate. These governance structures have representatives from a variety of federal and/or provincial agencies depending on their scope and purpose (Table 3). *Note:* Table is current as of October 24, 2010. Provincial Order in Council on October 25, 2010 may require changes to provincial participants.

Table 3. Summary of Pacific Federal-Provincial governance structures with an ocean management mandate.

| Body | Participants | Level | Role | Meetings |
|-----------------------------------|--|----------------------|--|----------------------|
| PIOC | DFO, TC, EC, WED, INAC, PCA, IC, NRCan | RDGs | Collaboration and strategic direction to federal oceans agenda | 2/year |
| PIOC Working Group | Same as PIOC | Program staff | Support PIOC | 6/year |
| RCOM | DFO, EC, PCA, NRCan, MoE, MEMPR, ILMB | RDGs, DMs | Oversight of Canada-BC MOU to implement Canada's Oceans Strategy | 2/year |
| OCC | Same as RCOM | Managers, Directors | Administer delivery of Canada-BC MOU | Every 6 weeks |
| MPAIT | Same as RCOM | Program staff | Implement Oceans Health theme of OCC work plan | Every 6 weeks |
| OIMS | Same as RCOM | Program staff | Implement Information & Data Management theme of OCC work plan | Every 6 weeks |
| ILMB Board of Directors & ADMCILM | Natural Resource Sector (NRS) - ILMB, MoE, MEMPR, MoFR, MARR, MoTCA, MAL | DMs, & ADMs | Strategic direction to resource management initiatives | Monthly or as needed |
| IDAC & SRMC | Natural Resource Sector (NRS) - ILMB, MoE, MEMPR, MoFR, MARR, MoTCA, MAL | Directors & Managers | Administer delivery of resources management initiatives | Monthly to quarterly |
| Inter Ministry Working Groups | Subset of Natural Resource Sector (NRS) | Program staff | Ensure effective coordination, FN consultation, communications | As needed |

Note: Acronyms are as follows: **Federal** – PIOC = Pacific Interdepartmental Oceans Committee; DFO = Department of Fisheries and Oceans; TC = Transport Canada; EC = Environment Canada; WED = Western Economic Diversification; INAC = Indian & Northern Affairs Canada; PCA = Parks Canada Agency; IC = Industry Canada; NRCan = Natural Resources Canada; RDGs = Regional Director Generals. **Federal – Province of BC** – RCOM = Regional Committee on Ocean Management; OCC = Ocean Coordinating Committee; MPAIT = Marine Protected Area Implementation Team; OIMS = Ocean Information Management System. **Province of British Columbia** – ILMB = Integrated Land Management Bureau; MoE = Ministry of Environment; MEMPR = Ministry of Energy, Mines & Petroleum Resources; MoFR = Ministry of Forests & Range; MARR = Ministry of Aboriginal Relations & Reconciliation; MoTCA = Ministry of Tourism, Culture & Arts; MAL = Ministry of Agriculture and Lands; ADMCILM = Assistant Deputy Ministers Committee on Integrated Land Management; IDAC = Inter-Agency Directors Committee; SRMC = Sub-Regional Managers Committee. *Table is current as of October 24, 2010. Provincial Order in Council on October 25, 2010 may require changes to provincial participants.

Endnotes

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