Fisheries and Oceans Canada | Pêches et Océans Canada

Managing Marine Mammals in Canada's Pacific Region

AN INTEGRATIVE MANAGEMENT FRAMEWORK

Canada

Legal Notice

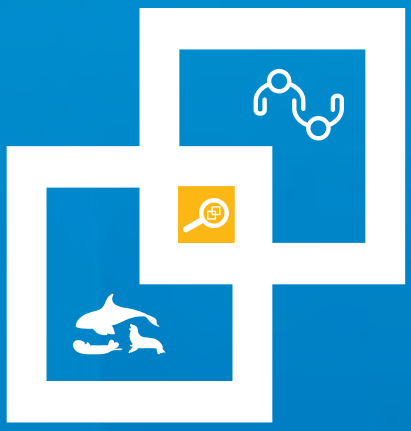
This document is not a legally binding instrument, and cannot form the basis of a legal challenge. The Framework and management measures can be modified at any time and do not fetter the Minister's discretionary powers set out in the *Fisheries Act*. The Minister can, for reasons of conservation or for any other valid reasons, modify any provision of the Framework in accordance with the powers granted pursuant to the *Fisheries Act*. This Framework is not a specified requirement under the *Fisheries Act*, the *Species at Risk Act*, or other Federal legislation referenced in this document. Rather, it is intended to serve as an overarching document for all marine mammals in Canadian Pacific waters, that sets out the context in which management actions are considered. Where DFO is responsible for implementing obligations under land claims agreements, the Framework will be implemented in a manner consistent with these obligations. In the event that the Framework is inconsistent with obligations under land claims agreements, the provisions of the land claims agreements will prevail to the extent of the inconsistency.

Cat. No. Fs144-71/2024E-PDF
ISBN 978-0-660-70138-7

Managing Marine Mammals in Canada's Pacific Region

AN INTEGRATIVE MANAGEMENT FRAMEWORK

What's Inside



OVERARCHING MANAGEMENT GOAL

Fisheries and Oceans Canada (DFO) is committed to working with Indigenous groups, other levels of government, stakeholders and coastal communities to protect marine mammal populations for the benefit of current and future generations of Canadians — balancing the conservation of marine life while providing important economic opportunities.

KEY CHALLENGE AND INTENT OF THIS FRAMEWORK

The overarching goal also represents a key management challenge: balancing the conservation and protection of marine mammals and their habitat with opportunities for a thriving blue economy. Managing this challenge involves making complex decisions with a wide network of people who share this goal. Featured throughout this Framework are some of our key challenges and the discoveries and advances we are making as we work collaboratively toward our goal.

The overarching intent for this Integrated Management Framework is to guide current and future marine management actions that will sustain vibrant marine mammal populations in British Columbia today, and into the future. This Framework also reflects Fisheries and Oceans Canada's commitment to an ecosystem-based approach which recognizes the complexity of ecosystems and the interconnections among component parts. As such, the tools inside aim to support an adaptable and integrative approach to allow managers across environmental management systems to consider the biological, geographical and functional importance that marine mammals hold for our marine environment as a whole.

ABOUT THIS FRAMEWORK

An Integrative Approach to Marine Mammal Management

We are seeing increasing human-caused impacts on oceans and their resources where marine mammals spend all or a substantial portion of their life. While Indigenous fishing and marine transportation continue to be of prime importance, they are now joined by other uses, such as aquaculture development, recreational and commercial fishing, and eco-tourism.

Canada's oceans are integral to Canada's social and cultural identity. However, many of the habitats used by marine mammals overlap with coastal communities, leading to a variety of interactions and impacts. Threats to marine mammals include limited prey availability, physical and acoustic disturbance, environmental contamination, vessel strikes, and fishing gear entanglements.

Managing impacts to marine mammals is complex. As apex predators, marine mammals are impacted by their food web, the ocean environment, climate-related changes and human activities.

Fisheries and Oceans Canada (DFO) has a responsibility to conserve and protect marine mammal species in Canadian waters. DFO practices the precautionary approach and works with a variety of partners to develop measures to manage impacts from human activities, including strategies to support the recovery of species that are at risk.

DFO's commitment to integrative management is reflected in our collaborative approach. We work with multi-jurisdictional government agencies, Indigenous groups, stakeholders and coastal communities across a wide range of marine interests, activities and issues throughout British Columbia.

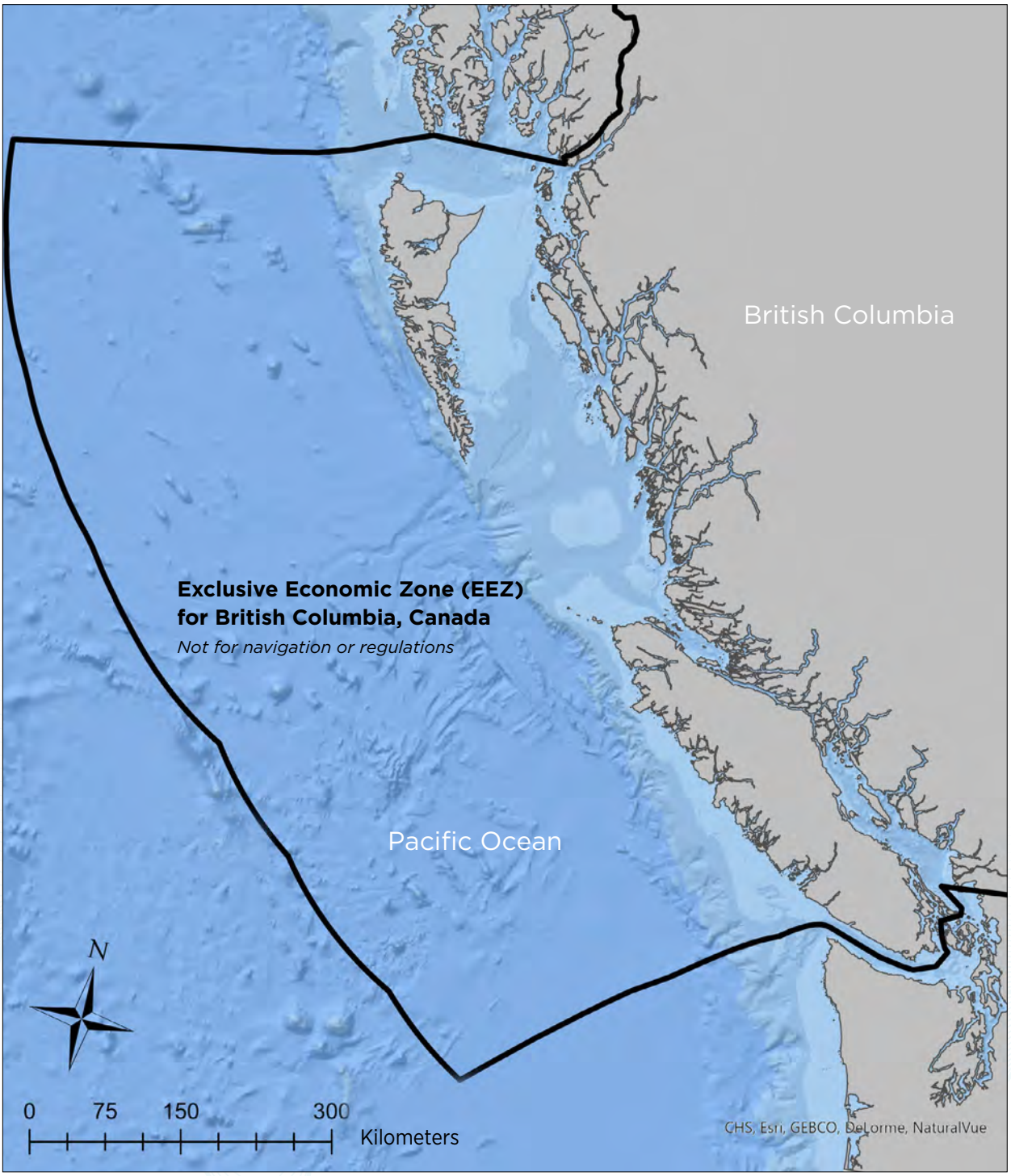
This collaborative effort involves the coordination and integration of science-based data and Indigenous knowledge which informs decision-making processes in support of our overarching goal and key challenge: balancing the conservation of healthy marine mammal populations with a vibrant and sustainable blue economy.

This Framework explains the integrative approach we are taking to prevent, minimize and mitigate threats to marine mammal populations in our waters, and identifies how we are addressing socio-economic concerns.

To move us toward our overarching goal we have identified the five management objectives below. These are featured within Section 3 of this Framework, which provides context, key areas of focus and some of the current management actions and programs underway for each objective. Relevant regulatory tools and links for more information are also included. This section is not intended to represent a comprehensive summary of all efforts for these objectives.

Five Action-focused Management Objectives (featured in Section 3)

INTEGRATE	CONSERVE	PROTECT	SUPPORT	SUSTAIN
Collect scientific, economic and socio-cultural data and indigenous knowledge on marine mammals.	Maintain healthy marine mammal populations.	Minimize threats to marine mammals and their habitat.	Support Indigenous involvement in marine mammal management, including access for Food, Social and Ceremonial (FSC) purposes.	Sustain marine economic sectors for Canadians, Indigenous and coastal communities while balancing the conservation and protection of marine mammals.


British Columbia
Exclusive Economic Zone (EEZ)
for British Columbia, Canada
Not for navigation or regulations
Pacific Ocean
N
0
75
150
300
Kilometers
GHS, Esri, GEBCO, DeLorme, NaturalVue

British Columbia is so biologically productive that 25% of all known marine mammal species in the world have been recorded in BC waters.

Over 30 Species of Marine Mammals Live Here

British Columbia (BC) has over 25,000 km of coastline that includes a complex network of deep fjords comprising diverse habitats that support highly productive ecosystems with over 30 species of marine mammals including whales, dolphins, porpoises, sea lions, seals, and sea otters. These mammals include some of the largest animals on earth, iconic species of cultural significance to Indigenous people and British Columbians, and species listed under Canada's *Species at Risk Act (SARA)*.

2

MARINE MAMMAL MANAGEMENT

Roles, Responsibilities and Relationships

This section identifies key responsibilities, roles and relationships involved in marine mammal management in the Pacific region of the west coast of Canada. It also outlines key regulatory tools for good governance.

Federal responsibilities include research, monitoring, enforcement, stewardship, education and outreach.

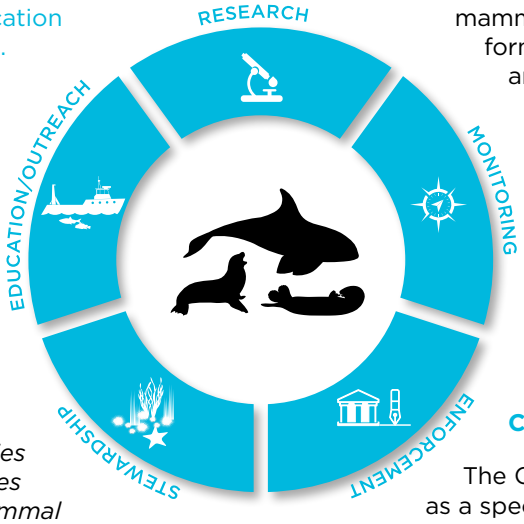
ROLES

Government of Canada

Fisheries and Oceans Canada (DFO)

DFO is involved in a variety of consultation, engagement and collaborative conservation planning processes with partners which helps to inform DFO's marine mammal research and management. In addition to consultation, DFO engages different groups in collaborative planning processes. These include bilateral engagements, advisory processes, technical working groups and roundtable forums.

▶ Federal roles in marine mammal management include research, monitoring, enforcement, education and outreach, and stewardship.



DFO is responsible for developing and implementing policies and programs to support Canada's economic, ecological, and scientific interests in marine waters. DFO's management of marine mammals is guided by a legislative and regulatory framework. Supported by a precautionary approach for policy development, this framework includes the *Fisheries Act*, the *Oceans Act*, the *Species at Risk Act*, and the *Marine Mammal Regulations*.

The Minister of Fisheries and Oceans and Canadian Coast Guard is responsible for appointing Fishery Officers to enforce fisheries regulations and management measures, including marine mammals.

Enforcement efforts are delivered by DFO Fishery Officers deployed to air, sea and land patrols, where they provide observer coverage on fishing vessels, monitoring at docksides, and remote electronic monitoring.

DFO's Conservation and Protection Program (C&P) plays an important role in marine mammal management in BC. Authorized under legislation and regulations to promote conservation of fisheries resources and habitat which includes marine mammals, C&P delivers support for informal and formal education programs and co-management/partnership agreements; land, sea and air monitoring, control and surveillance; inspections and compliance monitoring of third-party service providers and enforcement response for non-compliance; major case/special investigations through formal intelligence gathering and analysis; forensic audits; and legal prosecutions.

Canadian Coast Guard

The Canadian Coast Guard (CCG), as a special operating agency of DFO, is responsible for providing marine communications, marine traffic-management services, and incident command for marine spills under the *Coastal Fisheries Protection Act*. These functions can be applied to mitigate certain risks to marine mammals, such as vessel strikes and oil spills.

Marine mammal management roles are informed by a legislative and regulatory framework that includes the *Fisheries Act, Oceans Act, Species at Risk Act (SARA)* and *Marine Mammal Regulations.*

Roles: Government of Canada *continued...*

In 2020, the CCG launched the Marine Mammal Desk which receives reports of whale sightings and manages vessel traffic by providing enhanced situational awareness of Southern Resident killer whale activity and other cetaceans. Operating 24 hours a day, seven days a week, the Marine Mammal Desk leverages modern technologies including radar and Automatic Identification Systems (AIS) and real-time vessel movement information, and to support partners like Transport Canada by monitoring management measures designed to contribute to the survival and recovery of Southern Resident killer whales.

Environment and Climate Change Canada

Environment and Climate Change Canada is responsible for managing chemicals that are a threat to the environment. Many chemical substances end up in the aquatic environment, which poses a risk to the health of marine mammals. Substances that persist in the environment and can accumulate in the fatty tissue of marine animals (due to bioaccumulation) are of particular concern. Contaminants are released via municipal and industrial wastewater, urban and agricultural runoff, and other processes.

Canada's Chemicals Management Plan (CMP) is an initiative aimed at reducing the risks posed by chemical substances to Canadians and the environment. Through the CMP, the Government of Canada assesses and manages risks to human health and the environment posed by chemical substances that can be found in food and food products, consumer products, cosmetics, drugs, drinking water and industrial releases.

The *Canadian Environmental Protection Act, 1999 (CEPA 1999)* is the primary element of the legislative framework for protecting the Canadian environment and human health from pollution. A key aspect of CEPA 1999 is the prevention and management of risks posed by toxic and other harmful substances.

The *Prohibition of Certain Toxic Substances Regulations* prohibit substances declared toxic to the environment and/or human health under CEPA 1999. Since their creation, these regulations have been amended or republished multiple times to add or remove substances, or to remove exemptions. In 2022, amendments to the Prohibition of Certain Toxic Substances Regulations were proposed to introduce restrictions on two new flame retardants and increase restrictions on five chemicals used as flame retardants and oil and water repellents, some of which have been deemed priority substances of concern for endangered whales.

Parks Canada

The Parks Canada Agency is responsible for establishing national marine conservation areas, under the *Canada National Marine Conservation Areas Act*. Their aim is to protect and conserve important geographic locations for the benefit, education, and enjoyment of the public. The Parks Canada Agency is also responsible for establishing national parks, under the *Canada National Parks Act*, which can include marine components. Under the *Species at Risk Act*, the Agency is responsible for individuals of species at risk in or on the federal lands that it administers.

Marine mammal management in BC is a DFO-led process made possible through the collaborative efforts of jurisdictional partners, Indigenous groups, stakeholders and coastal communities.

Roles: Government of Canada *continued...*

Parks Canada's wardens conduct outreach and education. This work takes place in the Pacific Rim National Park Reserve, Gulf Islands National Park Reserve, Gwaii Haanas National Park Reserve, National Marine Conservation Area Reserve, and Haida Heritage site, as well as on-water patrols. In addition, they are responsible for enforcing the *Canada National Parks Act* and other federal and provincial legislation related to the mandate of Parks Canada.

Transport Canada

Transport Canada is responsible for the government's transportation policies, plans, and programs to promote safe, secure, efficient and environmentally responsible transportation throughout the country. Transport Canada develops policy and regulations for all modes of transportation, including dangerous goods and ensuring the transportation system is secure. In the marine sector, Transport Canada keeps waterways safe by regulating and monitoring pleasure craft and commercial and foreign-registered vessels.

Transport Canada is mandated to protect the marine environment with respect to navigation, safety and shipping under the *Canada Shipping Act, 2001* and the *Canada Marine Act*. This Department also leads Canada's National Oil Spill Preparedness and Response Regime, coordinating with other government Departments, including CCG and DFO. In 2018 the *Canada Shipping Act* was amended to include provisions related to responding to marine pollution events faster and more effectively, and to better protect marine ecosystems and habitats.

Transport Canada is also involved in the development of management measures to mitigate underwater noise and disturbance from large commercial vessels and smaller recreational boats.

Department of National Defense

The Department of National Defense (DND) supports the Canadian Armed Forces who serve on the sea, on land, and in the air with the Navy, Army, Air Force and Special Forces to defend Canadians' interests at home and abroad.

The Royal Canadian Navy conducts periodic military exercises in ecologically sensitive marine areas and/or critical habitat. These involve multiple military platforms to carry out training exercises.

Prior to conducting exercises, DND ensures that activities minimize risk to marine mammal populations. Appropriate mitigation measures are put in place, in particular for species of marine mammals that are listed under the SARA.

Honouring Our Highest Value in Times of Uncertainty

At Fisheries and Oceans Canada, marine conservation holds the highest value which influences management decisions about the human uses of our oceans and its resources. To honour this value, **the Precautionary Approach** is about being cautious when scientific knowledge is uncertain, and not using the absence of adequate scientific information as a reason to postpone action or failure to take action to avoid serious harm to fish stocks or their ecosystem.

DFO is accountable for implementing provisions of key regulatory tools including the *Fisheries Act* and the *Marine Mammal Regulations*.

TOOLS FOR GOOD GOVERNANCE

Legislative Framework

Fisheries Act

The *Fisheries Act* sets out provisions and principles that enable DFO to conserve and protect fish and fish habitat across Canada and to authorize harvest. The definition of fish under the *Fisheries Act* includes marine mammals and any parts of marine animals.

Marine Mammal Regulations

In past decades of commercial fisheries, many marine mammal species were depleted and some even became extinct. However, in the 1970s, precursors to the current Marine Mammal Regulations were put in place to protect marine mammals. Pursuant to s.43 of the *Fisheries Act*, *Marine Mammal Regulations* provide for the management and control of fishing for marine mammals and the conservation and protection of marine mammals in Canada and in Canadian fisheries waters. These Regulations are a primary regulatory instrument used to manage interactions with marine mammal populations.

Oceans Act

Marine mammals spend all or the majority of their lives in the marine environment. The *Oceans Act* sets out authorities for protecting ocean habitat, establishing Marine Protected Areas (MPAs) and supporting integrated oceans management. The *Oceans Act* also sets out Marine Environmental Quality non-regulatory and regulatory tools such as objectives, criteria, guidelines, and standards.

Species at Risk Act (SARA)

The *Species at Risk Act (SARA)* came into force in 2003 "to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity, and to manage species of special concern to prevent them from becoming endangered or threatened".

SARA contains several prohibitions to protect species listed on Schedule 1 of SARA. Under Sections 32 and 33 of SARA, it is an offence to: 1) kill, harm, harass, capture or take an individual of a wildlife species listed as extirpated, endangered or threatened under SARA; 2) possess, collect, buy, sell or trade an individual (or any part or derivative of such an individual) of a wildlife species listed as extirpated, endangered or threatened under SARA; and 3) damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered or threatened species, or that is listed as an extirpated species if a recovery strategy has recommended its reintroduction into the wild in Canada.

Section 58(1) contains provisions to prohibit the destruction of any part of the critical habitat of listed endangered or threatened species or of any listed extirpated species if a recovery strategy has recommended the reintroduction of the species in the wild in Canada. Critical habitat is the habitat necessary for the survival or recovery of a listed wildlife species and is identified in the recovery strategy or an action plan for the species.

Fisheries and Oceans Canada, Environment and Climate Change Canada and the Parks Canada Agency (PCA) share responsibility for implementing SARA. The Minister of Fisheries and Oceans is responsible for the protection and recovery of aquatic species at risk under federal jurisdiction, other than individuals in or on federal lands administered by PCA.

RESPONSIBILITIES

Marine Mammal Management in Canada

Leadership and Collaboration

DFO is the lead organization mandated by the Government of Canada to manage and protect marine mammals in Canadian waters but this work is not done alone. DFO is committed to working collaboratively with numerous groups, including within the federal government, and among levels of government; with Indigenous peoples and stakeholders; and engage Canadians in marine mammal related decisions in which they have a stake.

DFO works with a network of partners to manage a wide range of marine mammal subjects requiring expertise. This includes Indigenous groups, other federal and provincial government agencies, fishing and environmental stewardship organizations, Environmental Non-Governmental Organizations (ENGOs), and communities across the region who share a commitment to conserve and protect marine mammals, their habitats, and ecosystems. These collaborative efforts span monitoring, research, management action, enforcement, stewardship and education and outreach. This framework captures efforts and actions by Indigenous groups and organizations as key examples, yet is not a comprehensive summary of all efforts.

International Relations

Canada plays an international role in supporting the conservation and management of marine mammals. DFO works with other international organizations and bodies to contribute towards scientific research, collaborate on management approaches, and comply with standards related to the conservation and sustainable management of marine mammals.

Canada is party to United Nations Conventions and Agreements. These include The UN Convention on Biological Diversity (UNCBD), Migratory Species Convention, the 1982 United Nations Convention on the Law of the Sea (UNCLOS), as well as the North American Agreement for Environmental Cooperation and Strategic Plan for North American Cooperation in the Conservation of Biodiversity (2003).

DFO has a strong working history with the U.S. to address marine mammal conservation across international waters. DFO Pacific Region works on research, management actions, education and outreach programs with the National Oceanic and Atmospheric Administration (NOAA) and the Washington State Department of Fish and Wildlife.

Canada collaborates with the International Whaling Commission (IWC) on research and management initiatives. Canadian scientists provide data to the IWC, helping inform the commission's science committee on whale stocks. This information is used to promote the adoption of conservation and management measures for marine mammals internationally.

DFO and Canadian responders are members of the IWC Global Whale Entanglement Response Network where the Expert Advisory Panel on Entanglement Response shares their knowledge and expertise to develop best practices to support international efforts to disentangle whales that are tangled in fishing gear or marine debris. See section 3 of this Framework for more information on disentanglement.

Canada follows international standards related to the Convention on the International Trade in Endangered Species (CITES) of Wild Flora and Fauna relevant to cross-border movement of marine mammals. This includes monitoring the trade of marine mammals and/or their parts between countries. CITES work is led by Environment and Climate Change Canada's Canadian Wildlife Service (CWS) which provides data on species and trade to meet Canada's international reporting commitments under CITES.

Links for more information:

- IWC Network
- United Nations Conventions and Agreements

After conservation, respecting First Nations' Aboriginal right to fish for food, social and ceremonial (FSC) purposes, or domestic purposes under Treaty has priority over other uses of the resource.

TOOLS FOR GOOD GOVERNANCE

Respecting the Rights of Indigenous Peoples

Indigenous Peoples have holistic approaches to management of aquatic ecosystems, including marine mammals, since time immemorial and prior to European settlement. Marine mammals and the management of aquatic resources have particular importance to many Indigenous communities. Marine mammal habitats, oceans and aquatic resources are located within the traditional territories of many Indigenous groups. Indigenous groups consider the management of these resources to be of vital importance and play an important role in governance and stewardship in relation to marine species and ecosystems.

The Government of Canada is working with Indigenous groups who are seeking greater access to economic opportunities from aquatic resources as a potential driver for economic development in their communities. In addition, Indigenous groups seek a greater role in stewardship, including research, oceans and habitat management, conservation and protection, SARA listing processes, and recovery document development and implementation.

Commitment to Reconciliation

DFO is committed to the recognition and implementation of Indigenous and treaty rights related to fisheries, oceans, aquatic habitat, and marine waterways in a manner consistent with section 35 of the Constitution Act, 1982, the United Nations Declaration on the Rights of Indigenous peoples, the United Nations Declaration on the Rights of Indigenous Peoples Act, and the federal Principles Respecting the Government of Canada's Relationship with Indigenous Peoples.

DFO-CCG Reconciliation Strategy provides a guidance document to better understand why and how reconciliation informs the work of the Department.

Duty to Consult

The Government of Canada has a duty to consult, and where appropriate, accommodate Indigenous groups (Aboriginal Consultation and Accommodation — Updated Guidelines for Federal Officials to Fulfill the Legal Duty to Consult, 2011) when it considers conduct that might adversely impact potential or established Aboriginal or treaty rights.

Engagement and Consultation

Consultation is an essential part of good governance, sound policy development and decision-making, and Canada has a statutory, contractual and/or common law obligation to consult with Indigenous groups on issues that may have implications for their rights.

Fisheries and Oceans Canada consults with First Nations, stakeholders and Canadians on matters of interest and concern to them.

In considering issues related to the management of marine mammals in the Pacific region, Fisheries and Oceans Canada engages with Indigenous groups through existing governance forums such as the First Nation Fisheries Council, and bilaterally, including through existing Treaty process and other venues.

Establishing a renewed relationship with Indigenous Peoples is a key priority for the Government of Canada. Reconciliation is an ongoing journey and a long-term commitment based on the recognition of rights, respect, co-operation, and partnership.

Tools for Good Governance: Respecting the Rights of Indigenous Peoples *continued...*

Treaties and Reconciliation Agreements

Treaties and Self Government Agreements

In 2023, there are modern treaties and self-government agreements in British Columbia, which all have fisheries chapters (such as Nisga'a Final Agreement, Tsawwassen First Nation Final Agreement, Maa-nulth First Nations Final Agreement, Tla'amin (Sliammon) Nation Final Agreement, Sechelt Self-government Act). Through these treaties, Nations work with DFO to manage treaty fisheries on an annual basis. There are also historic treaties in British Columbia (such as Douglas Treaties).

For a current list of treaties in BC and Yukon, please visit: https://www.pac.dfo-mpo.gc.ca/reconciliation/arrangements-ententes-eng.html.

Fisheries chapters in modern treaties articulate a treaty fishing right for domestic purposes that are protected under Section 35 of the Constitution Act, 1982. Negotiated through a side agreement, some modern treaty First Nations have commercial access through a Harvest Agreement outside of the constitutionally protected treaty.

Canada, British Columbia and representatives of participating First Nations in British Columbia have co-developed the Recognition and Reconciliation of Rights Policy that sets the framework and guidance for a more meaningful way to work together in treaty negotiations. This includes recognition of rights, co-development of mandates and increased flexibility for incremental and evolving agreements. DFO will continue its bilateral work with Treaty Nations through established governance bodies, such as marine mammal subcommittees, where interests and issues related to the management of marine mammals can be discussed — including wildlife harvesting rights.

Treaty negotiations are underway with many First Nations in western Canada.

Reconciliation Agreements

In addition to negotiating treaties, the Government of Canada and Indigenous peoples can also negotiate Recognition of Indigenous Rights and Self-Determination (RIRSD) agreements, to explore new ways of working together to advance the recognition of Indigenous rights and self-determination.

These reconciliation agreements are led by Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC). DFO can also negotiate Fisheries Resources Reconciliation Agreements directly with First Nations to enhance collaborative governance and management on fisheries, marine and aquatic matters, environmental science, and stewardship provisions and to provide a robust and meaningful process for engaging stakeholders. These agreements may also contain fisheries, environmental science and stewardship provisions.

For more details on Respecting the Rights of Indigenous Peoples please visit these links:

United Nations Declaration on the Rights of Indigenous peoples

The United Nations Declaration on the Rights of Indigenous Peoples Act

The Principles Respecting the Government of Canada's Relationship with Indigenous peoples

DFO's Reconciliation Strategy

Reconciliation in British Columbia and Yukon

Information on Indigenous fisheries and reconciliation

Information on the Government of Canada work to advance reconciliation

Strengthened coordination with Indigenous groups, other governments and stakeholders is helping to enhance understanding of the direct threats to marine mammal populations.

RELATIONSHIPS

Governments, Indigenous Groups and ENGOs

Provinces and Municipalities

Provincial and municipal governments share responsibilities related to impacts on marine mammal habitat. Provinces have primary responsibility for provincial lands, shorelines and specific seabed areas. Municipalities have responsibility for many of the land-based activities affecting the marine environment.

The Government of Canada engages bilaterally with the Province of British Columbia on a number of issues related to marine mammals; in particular, for matters related to management considerations across federal and provincial jurisdictions concerning freshwater ecosystems.

Municipalities and regional districts in B.C. are empowered by provincial legislation to govern in a wide range of areas pertinent to issues concerning marine environments and mammal populations.

Indigenous Groups

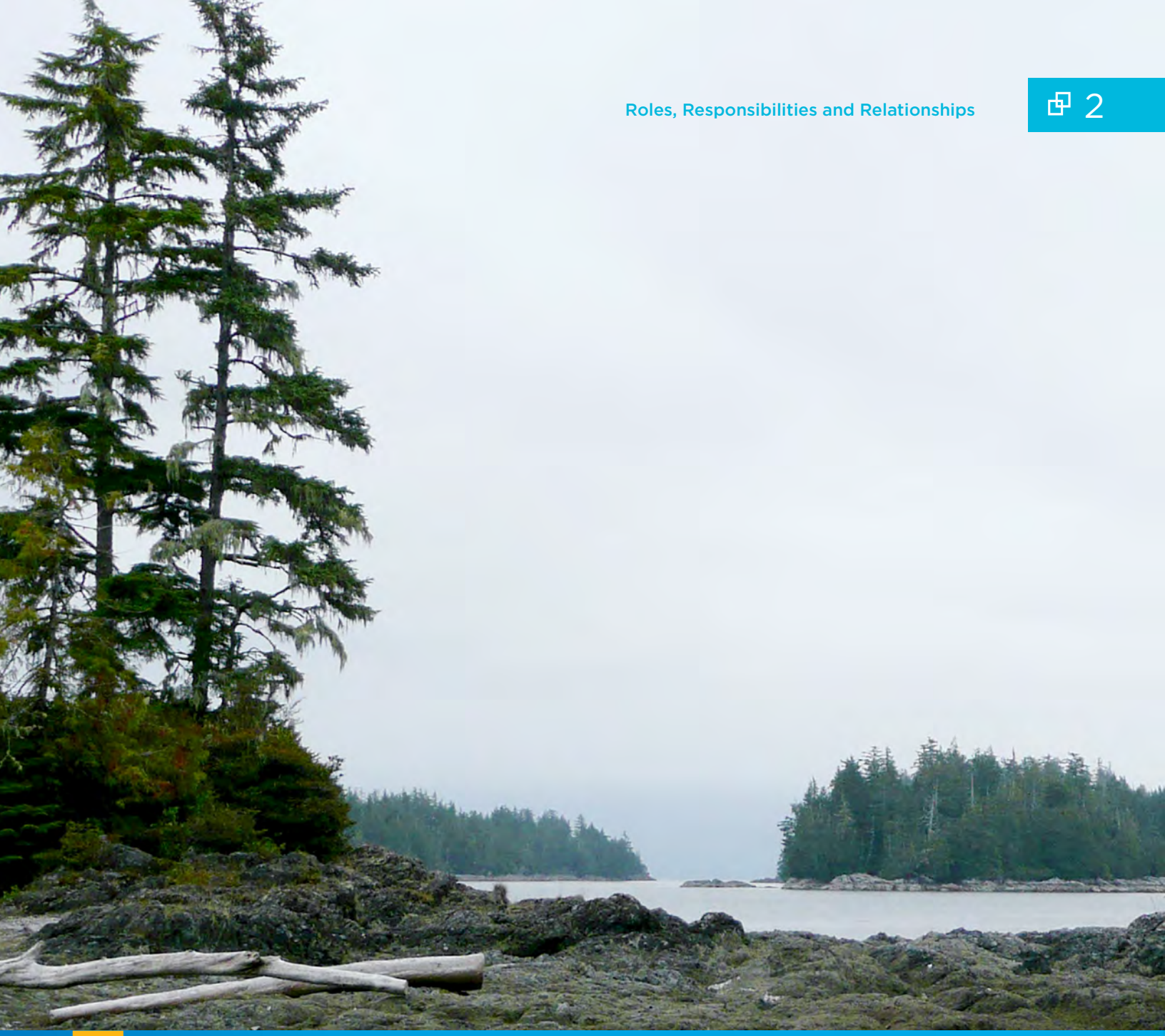
Marine mammals and the management of aquatic resources have particular importance to many Indigenous communities. Indigenous Peoples have holistic approaches to management of aquatic ecosystems, including marine mammals, since time immemorial and prior to European settlement.

Oceans, aquatic resources and marine mammal habitats are located within traditional territories of many BC Indigenous groups. Indigenous groups consider management of these resources to be of vital importance and play an important role in governance and stewardship of marine species and ecosystems.

Indigenous groups are seeking greater access to economic opportunities from aquatic resources as a potential driver for economic development in their communities. These groups are seeking a greater role in stewardship, including research, oceans and habitat management, conservation and protection, SARA listing processes, and recovery document development and implementation.

Environmental Non-Governmental Organizations

ENGOs support a variety of marine mammal management activities including research and data collection to inform the development and implementation of management actions, and stewardship activities such as on-water monitoring, education and outreach.



Aboriginal Coastal Communities

The Aboriginal Fishery Guardian Program plays an important role in improving fisheries management in Aboriginal coastal communities. Guardians are engaged in compliance, monitoring and stewardship activities to ensure the conservation and protection of fisheries resources in their communities. Additionally, Guardians may be engaged in habitat restoration, stock assessment or other activities to promote sustainable fisheries.

Fisheries and Oceans Canada and the Canadian Coast Guard manage Canada's fisheries and safeguard its waters by ensuring that Canada's oceans and other aquatic ecosystems are protected from negative impacts.

RELATIONSHIPS

Commitments and Accountability

Accountability is about reliably delivering on commitments in a transparent way, and providing information around how decisions are made. DFO's *Departmental Plan* sets direction for core plans, programs, risks and resources. Several elements in these plans are related to the protection and sustainable management of marine mammal populations including:

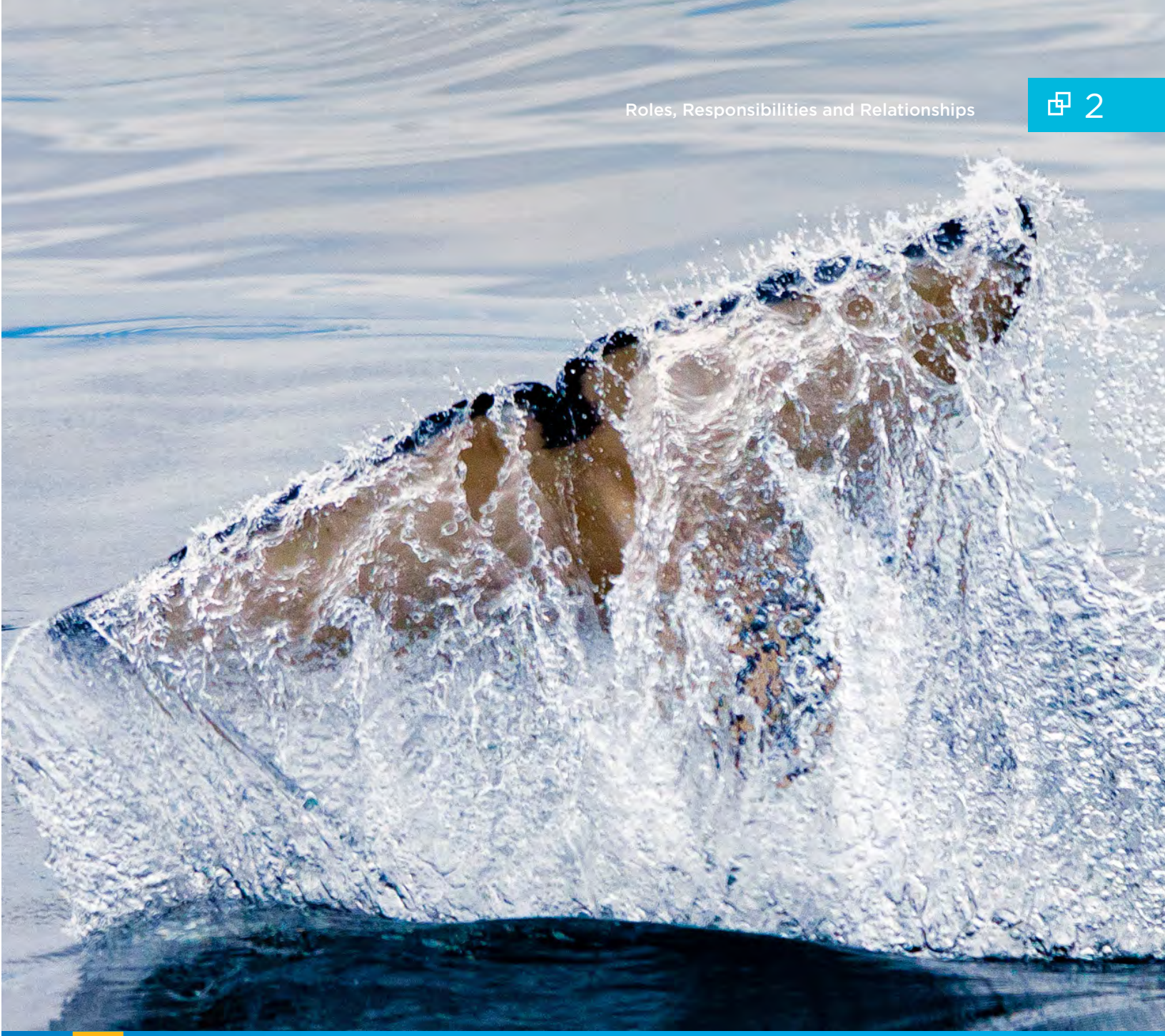
- Fisheries, oceans and other aquatic ecosystems are protected from unlawful exploitation and interference;
- Enhanced relationships with involvement of, and outcomes for Indigenous people;
- Development projects occurring in or near water that effectively avoid, mitigate or offset impacts to fish and fish habitat;
- Aquatic species/populations at risk listed under the SARA for which a recovery strategy/ management plan is legally required;
- Science products related to aquatic ecosystems are available;
- Promote the open and transparent sharing of information with Indigenous Nations as part of engagement programming related to marine mammals; and
- DFO's ongoing commitment to reconciliation.

In addition to these annual documents, DFO responds to key recommendations including the reports from the Auditor General. For example in 2018, the Commissioner of Environment and Sustainable Development identified a number of recommendations related to the protection of marine mammal populations in Canada in the *Report 2 – Protecting Marine Mammals*. A summary of actions to date are also provided in the Management Action Plan Progress Report.

We're committed to building renewed nation-to-nation, Inuit-Crown and government-to-government relationships with First Nations, Inuit and Métis peoples. As part of this commitment, we have developed the *DFO-CCG Reconciliation Strategy*.

Under SARA, the competent minister must report on the implementation of management plans or recovery strategies five years after they are included in the public registry and in every subsequent five-year period, until their objectives have been achieved. For an action plan, the competent minister must monitor progress towards meeting its objectives and assess and report on its implementation and its ecological and socio-economic impacts five years after the plan comes into effect. The implementation of these activities helps to address the broad strategies and recovery goals and objectives identified in recovery strategies.

DFO and the Canadian Coast Guard have a key role in the transformation of Canada's relationship with Indigenous peoples. In the context of marine mammal management, this Framework recognizes that fisheries, oceans, aquatic habitat and marine waterways are of great social, cultural, spiritual and economic importance to many Indigenous peoples.



Partnerships and Trans-boundary Communication

Be Whale Wise is a partnership of government agencies, non-profits and other stakeholders that researches, implements, and provides education about best vessel practices around whales on both sides of the border in Canada and the US. Established in 2001, this growing partnership is enhancing public awareness of threats to marine mammals and how to help through better boating behaviour.

This Framework is intended to guide current and future management actions in order to sustain vibrant marine mammal populations in BC — now and into the future.

Relationships: Commitments and Accountability *continued...*

DFO is accountable for implementing provisions of key regulatory instruments including *the Fisheries Act* and the *Marine Mammal Regulations*. Information on permitting, including a list of permits that have been granted for scientific research of marine mammals.

While DFO has increased capacity and developed measures to address threats related to some species of marine mammals such as the Southern Resident killer whale population, important work for other species remains to be done.

In 2021, DFO published the *Southern Resident Killer Whale Accountability Framework*: *Evaluating support for recovery*. This looks at how the Southern Resident killer whale management measures are contributing to the population's recovery over time.

This framework captures data collected by the Government of Canada and its partners through three priority action categories, which each have indicators and performance measures. Together, the information collected about these categories describes an important piece of the puzzle and offers a snapshot of how the Government of Canada and its partners are doing in their support of Southern Resident Killer Whale recovery. This gives us information about trends towards our goal, highlights where we need to improve, and provides information for discussions going forward.

DFO's Marine Mammal Response Program collects and periodically publishes data related to incidents involving marine mammals. This demonstrates how DFO is responding to incidents such as sick, injured or distressed animals; harassment incidents; dead animals, entanglements, vessel strikes (collisions); and live stranding.

DFO provides information to the National Oceanic and Atmospheric Administration on Canadian fisheries that export to the U.S. to ensure international compliance and meet requirements with the *U.S. Marine Mammal Protection Act Fish and Fish Product Import Provisions*. This includes information on marine mammal bycatch reporting, monitoring programs and mitigation measures.

Additional work will be undertaken incrementally to meet the priorities of the Government, informed by input from Indigenous groups and stakeholders. This includes continuing to develop integrated management plans for species, advancing management actions based on new science, and strengthening mitigation measures that address direct threats to marine mammal populations.

Link for more information:

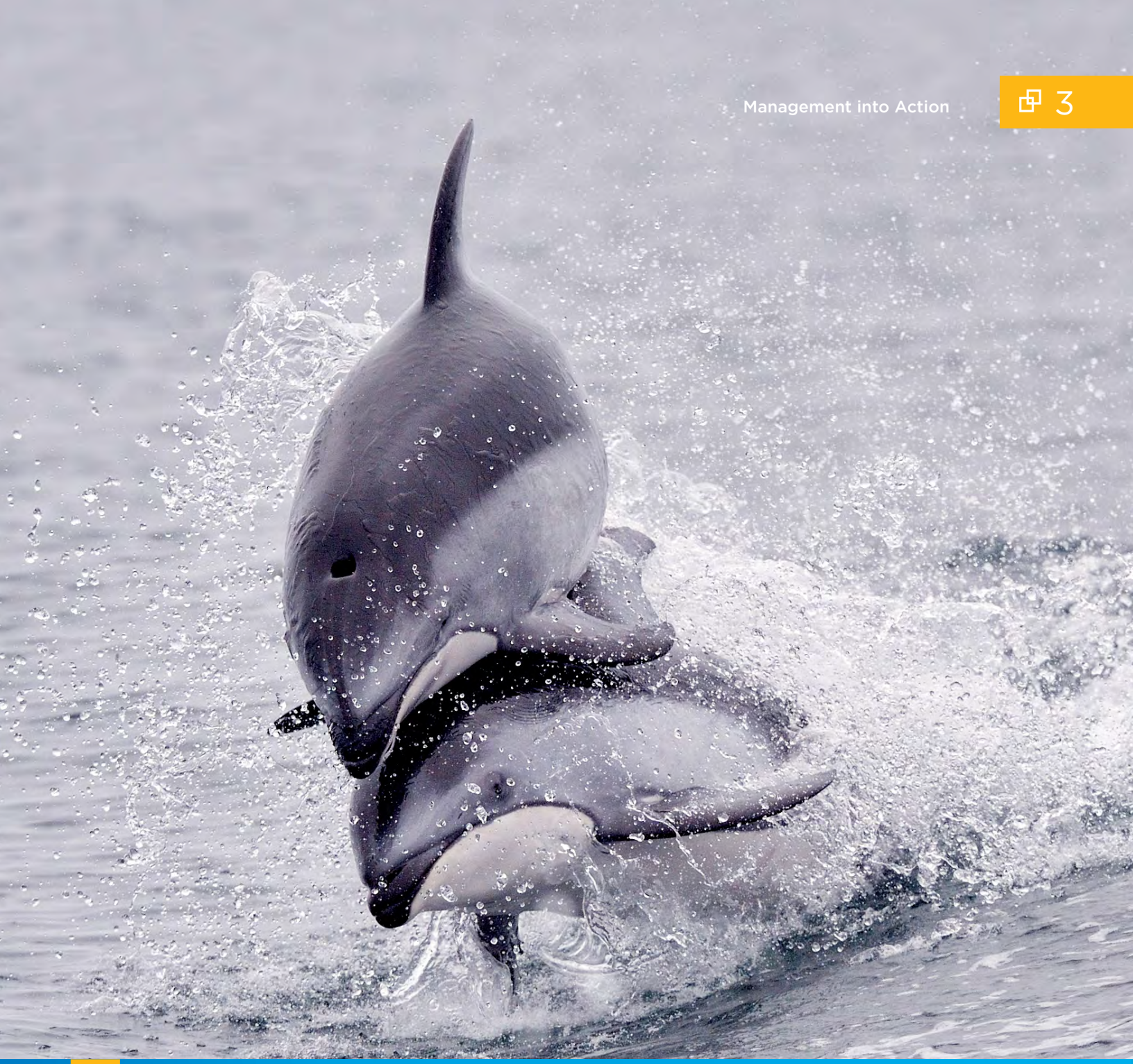
Annual reporting on incidents involving marine mammals

3

MANAGEMENT INTO ACTION

Objectives, Actions & Programs

This section features our five action-focused objectives. Context and key areas of focus are outlined for each, followed by some of the current management actions and programs in effect today. Links for more information and relevant regulatory tools are also provided. This section does not represent a comprehensive summary of all regional efforts toward these objectives and is instead meant to provide a snapshot of current efforts.



Working Together to Achieve Management Objectives

Collaboration is fundamental for actioning interconnected management objectives. Through collection and sharing of scientific, economic and socio-cultural data and indigenous knowledge (Objective #1), we are enhancing understanding of marine mammal populations in our BC waters which is informing measures to protect the health (Objective #2) and minimize threats to marine mammals and their habitats (Objective 3). Enhanced understanding is also strengthening support for Indigenous involvement in marine mammal management (Objective 4), and the collective commitment to balance marine conservation with sustainable economic sectors (Objective 5).

OBJECTIVE 1
Understand

Collect scientific, economic and socio-cultural data and indigenous knowledge on marine mammals

Context

Central to our management role is the continuous collection, coordination and integration of information about marine mammals. This includes a balanced mix of scientific, economic and socio-cultural data and Indigenous Knowledge. This integration of both quantitative and qualitative information that is sourced across sectors and disciplines is fundamental to our informed and transparent decision-making process.

DFO collaborates with other federal organizations to support policy development that considers the integration of Indigenous Knowledge into decision making processes. DFO is also working collaboratively with federal partners on the Indigenous Knowledge Policy Framework Initiative being led by the Impact Assessment Agency of Canada.

Marine Mammal Science

Science support for marine mammal management is important for understanding different aspects of marine mammal biology and behaviour and is used to inform evidence-based management and decision-making. DFO's marine mammal research has evolved over the last few decades to support Species At Risk, oceans management, and fisheries management programs.

Economic Importance

Marine mammals provide key ecosystem services for biodiverse ocean ecosystems and socio-economic value for Canada's Blue Economy. British Columbia is well known for whale watching and includes a strong commercial whale watching industry to bring Canadian and visitors alike on the water or in the air to view marine mammals in the wild.

The health of marine mammal populations and habitats also provide indirect benefits for commercial fisheries that share their range. Consumers and governments are increasingly motivated to support commercial fisheries that demonstrate sustainable practices, eliminating or reducing risks to marine mammals during harvesting activities.

In recent years, international programs and initiatives are encouraging more sustainable harvest practices that greatly reduce impacts on marine mammals. These include the Marine Stewardship Council certification process, and the *U.S. Marine Mammal Protection Act (MMPA)* provisions for foreign fisheries that will come into effect in 2023. The MMPA provisions reflect concerns among scientists and the public about declines, or a lack of recovery for some marine mammal species as a result of human activities. In Canada and

Areas of Focus

- Better understand marine mammal populations, including ecosystem interactions and their habitat use, while also considering the impacts of climate change.
- Improve co-operation in the collection, monitoring and dissemination of information.
- Use integrated data collection, monitoring, research, synthesis, and information sharing, communication and education such that the full range of relevant knowledge is applied to the planning process and decision-making process, including scientific studies and local and Indigenous Knowledge.
- Promote understanding of marine mammals and their marine environment, and link to other processes and knowledge gathering activities.
- Strengthen linkages and continue to build relationships with partners that conduct research on marine mammals.
- Provide data and information to support species at risk recovery planning initiatives, mitigation options, and policy development.
- Reflect historical role and cultural importance of marine mammals for Indigenous groups.

Link for more information

Pacific Science field operations

OBJECTIVE 1
Understand

Collect scientific, economic and socio-cultural data and indigenous knowledge on marine mammals

Importance of Indigenous Knowledge Systems (IKS) is evident in requirements to integrate it into eco-management arrangements, environmental assessments and recovery plans.

Objective 1 Context *continued...*

other nations that export fish and fish products to the United States, NOAA's MMPA initiative will evaluate regulatory programs to address incidental and intentional mortality and serious injury of marine mammals.

Socio-Cultural Importance

DFO recognizes that our oceans and all marine resources — including marine mammals — are integral to the well-being of all Canadians. Marine mammal viewing and whale watching opportunities in the Pacific region hold significant social and recreational value. These publicly accessible experiences are helping to advance marine education and strengthen a collective sense of marine stewardship.

For many coastal First Nations, there is a deep cultural and spiritual connection to marine mammals and their habitats. This connection extends to language and traditional knowledge, and the health of communities. The health of the resources, including marine mammals, have direct links to the health of indigenous culture.

Whales in general, including killer whales, are central within the cosmology and mythology of some First Nations and Orcas are regarded as a transformational creature involved in many oral traditions and cultural practices and are of great significance to governance rights. Many Indigenous groups have their own traditional laws, teachings, and understanding of responsibilities which inform their own marine assessment methods and management plans. Historically, BC coastal First Nations have hunted pinnipeds, small cetaceans and sea otters and some Nations hunted large whales. For some Nations, marine mammals continue to play an important role in their economies.

Indigenous Knowledge Systems (IKS)

IKS may be defined differently by different Indigenous communities. Indigenous Knowledge (IK) has also been referred to as Aboriginal Traditional Knowledge (ATK) and Traditional Ecological Knowledge (TEK). IKS are holistic —viewing the interconnectedness of whole systems — and represent a cumulative body of knowledge that is gathered by an adaptive process. Handed down over generations by First Nation, Métis or Inuit individuals and communities, these systems are also regionally and locally specific and are not separable from their knowledge keepers who hold regional, local and spiritual connections to ecosystems and all forms of plant and animal life.

In 2019, the *Fisheries Act* was amended to include provisions such that the Minister may consider Indigenous Knowledge in making decisions pertaining to fisheries, fish and fish habitat, as well as provisions for the additional protection of that knowledge when shared in confidence.

The Government of Canada and the science community acknowledge a need to consider Indigenous Knowledge Systems in meaningful and respectful ways. This represents a challenge for resource managers. Learning how to respectfully engage knowledge holders is a priority in order to ensure that IK is used and shared with other Indigenous groups, stakeholders, managers, and policy makers in acceptable ways. IK contributes to an overall understanding of fish stocks, marine mammals, and their habitats, helping to fill knowledge gaps and inform decisions related to resource management and marine mammal conservation.

OBJECTIVE 1
Understand | Management Actions & Programs

DFO Research

Cetacean Research Program focuses on estimating population size and identifying critical habitat for threatened and endangered species, and includes:

- **The acoustic program** uses passive acoustic monitoring to identify the presence of different species of whales and their habitat use through passive acoustic monitoring instruments (hydrophones) that have been deployed coast-wide in various areas over time with a recent focus on offshore seamounts;
- **The annual Northern Resident Killer Whale Census** which collects population demographic information used to inform growth rates, population structure and coast-wide distribution. Census results are published annually and a Northern Resident killer whale photo-identification catalogue is update periodically.
- **Sea otter surveys** which provide data on population abundance and distribution of this important recovering species.
- **Annual ship-based surveys: Pacific Region International Survey of Marine Megafauna (PRISMM)** was a first-of-its-kind, coast wide survey to collect data on distribution and abundance of as many cetacean species as possible using a mix of acoustic and visual methods. **Pinniped Research Program** conducts aerial surveys of pinnipeds (seals and sea lions) to estimate abundance and distribution and to monitor population trends. This program also undertakes diet assessments of pinnipeds — an area of research essential for modeling the ecological role of pinnipeds.

Whale Contaminant Research Program is focused on understanding factors affecting the health of whale populations, including identifying and prioritizing contaminants of greatest concern to Resident killer whales populations. Efforts are conducted both within and outside critical habitat to compare and contrast levels, particularly as prey species often migrate across these critical habitat boundaries. Much of the work is directed at measuring contaminant levels in prey species, such as chinook salmon, as well as other species, such as forage fish that form the food web for marine mammals. Through a food web approach, the program is informing new Environmental Quality Guidelines (EQGs) that are more protective of upper trophic level species such as Killer Whales. Efforts are also being conducted along with veterinary pathologists at the BC Ministry of Agriculture and Food to better understand impacts of marine biotoxins, often caused by naturally occurring harmful algal blooms (HABs), on marine mammal strandings.

Studies on Chinook Salmon-Killer Whale Interactions provide a better understanding of when, where, and how adult Chinook salmon utilize areas that have been identified as critical habitat for killer whales. In addition, how SRKW are using coastal waters for feeding, travel, developing a better understanding of SRKW diet over space and time, and how that overlaps with Chinook distribution and availability as a major prey item.

Whale Detection and Collision Avoidance Program evaluates the efficacy of different technologies (acoustic, optical including infrared, satellite imagery, sightings networks, survey flights, etc.) to detect and classify different whale species and their applicability in different parts of the coast.

The Ocean Protection Plan Marine Environmental Quality Initiative (MEQ) contributes to our knowledge base on how vessel based noise affects and impacts cetaceans. Efforts to date have been largely focused on Southern Resident killer whales with more recent efforts expanding to other species and their respective habitats. For SRKW efforts focus on how they use their habitat to inform mitigation strategies. In addition, DFO Science is monitoring key Southern Resident killer whale habitat locations to establish baseline ambient acoustic levels (i.e. starting from present day conditions) on which to inform an offset program from commercial vessels. This initiative encompasses several projects including:

- Evaluating the efficacy of protected areas in mitigating the impacts of disturbance on killer whale behaviour.
- Southern Resident killer whale habitat use patterns.
- Quantifying the importance of Swiftsure Bank to Resident killer whales.
- To minimize impacts on Southern Resident Killer whales, research on Northern Resident killer whale is used as a proxy to evaluate vocal activity, behavioural states and acoustic environment using digital acoustic recording tags.

The Canadian Science Advisory Secretariat (CSAS) serves as the primary departmental forum for peer review and evaluation of scientific research and literature for all species. CSAS fosters national standards of excellence and coordinates the peer review of scientific assessments and advice. CSAS also coordinates communication of the results of the scientific review and advisory processes.

OBJECTIVE 1
Understand | Management Actions & Programs

The CSAS process for marine mammal science is called the National Marine Mammal Peer Review Committee. Meetings provide the opportunity for collaborative review of scientific results by marine mammal experts from across the Department and with participation from other (non-DFO) organizations. Following National Marine Mammal Peer Review Committee peer-review and approval, scientific results are used to provide scientific advice for the management and conservation of marine mammals in Canada.

Detection

The collection and interpretation of whale presence data can support the refinement of management measures. When coupled with the capacity to implement and assess the success of such measures, can lead to better outcomes for marine mammals while at the same time minimizing impacts to Indigenous groups, stakeholders and the public.

Because of the way many marine mammals communicate, detections can be done visually and acoustically. Marine mammal detections can be used to: a) develop and implement management approaches; b) notify mariners to mitigate risk of vessel strikes; c) mitigate impacts of oil spills and environmental response; d) aid in education, outreach and compliance; and e) increase our understanding of specific species and population distribution.

Marine mammal sightings information is collected from both government and non-government sources in Canada and the U.S. Methods include land-based detection methods (e.g. infrared cameras, land-based observer sightings) and underwater detection (e.g. hydrophone systems). Sightings data comes from a number of sources including the Ocean Wise Sightings Network WhaleReport Alert System (WRAS); Canadian Coast Guard, fleet and light stations; DFO and Transport Canada aerial surveillance; and on water and land observations by researchers and experts.

Marine Mammal Hydrophone Systems
Underwater noise can have a significant effects on marine mammals, and deploying hydrophone systems coupled with predictive modeling can be a tool used to help experts better understand impacts.

A number of different hydrophone systems are in place to: a) understand baseline noise in areas frequented by whales through passive hydrophone networks; b) monitor for the presence, distribution and location of travel of whales (e.g. vocalizations by killer whales and humpback whales) in order to respond to oil spills, reduce vessel strike risk and support the implementation of fishing closures to protect key foraging areas for Southern Resident killer whales through near real-time networks; c) assess if management measures are reducing noise levels (Burnham et al. 2021); and d) support the use of modeling. Below are key DFO led examples of acoustic detection programs.

DFO Science Branch Marine Ambient Acoustic Program has deployed 12 autonomous passive acoustic recorders to monitor the underwater soundscape in parts of Southern Resident killer whale critical habitat. The information assessed from this program will be used to examine the acoustic contributions to the broadband soundscape from natural and anthropogenic sources, and refine the understanding of spatiotemporal contributions and overall soundscape composition. This includes identifying and characterizing noise contribution from large commercial vessels and modelling large commercial vessel noise contribution and reduction from applied mitigation measures.

The Whale Tracking Network, a near real time hydrophone network that monitors whale locations in southern BC, and can help determine the direction of marine mammal travel, supports management actions, including responding when an emergency event occurs such as a chemical or oil spill and supporting the implementation of fishing closures based on Southern Resident Killer Whale confirmed presence.

Through its network of hydrophones in strategic locations on the west coast of Vancouver Island, the Gulf Islands and the Strait of Georgia, DFO and Google are collaboratively developing an Artificial Intelligence program that uses existing hydrophone networks to detect killer whale presence.

The Artificial Intelligence program uses calls, whistles and echolocation clicks to distinguish killer whale calls from other ocean noise. The Whale Tracking Network supports the implementation of fishing closures in key Southern Resident killer whale foraging area to implement closures to protect this area once the whales are confirmed as present in the area.

If you see a marine mammal please contact:

Phone: 1.866.I.SAW.ONE (1-866-472-9663)
Web: Ocean Wise Sightings Network
Email: mailto:sightings@ocean.org
App: WhaleReport

OBJECTIVE 2
Conserve

Maintain healthy marine mammal populations

Context

Healthy marine mammal populations have demographic conditions that preserve their reproductive potential, genetic variation, and cultural continuity.

Actions to recover and sustain numerous marine mammal populations have been successful thanks to a multitude of conservation efforts at many different levels, from international to national, regional to local, involving governments, ENGOs, local communities and private citizens. The following is a non-comprehensive list of some of the ways that DFO is working to conserve marine mammals.

Protecting Species at Risk

Given the number of marine mammals listed under the *Species At Risk Act (SARA)* and DFO's precautionary management approach, alignment with SARA objectives and recovery planning processes is foundational for maintaining healthy marine mammal populations.

Currently, there are thirteen SARA-listed species of marine mammals in BC: four as endangered (4); four as threatened (4); and five of special concern (5).

SARA is an important tool for protecting these species. It sets out requirements for the development of Recovery Strategies and Action Plans for species listed as extirpated, endangered or threatened, and management planning requirements for species listed as special concern.

Under SARA, the competent minister must report on the implementation of management plans or recovery strategies five years after they are included in the public registry, and in five-year reporting periods thereafter until objectives are met.

Once an Action Plan comes into effect, the competent minister must monitor and assess progress towards objectives and in the fifth year, report on its implementation and the ecological and socio-economic impacts.

Implementing SARA requirements helps to address broad management strategies and the specific goals and objectives identified in Recovery Strategies. The 2022 publication of the *Report on the Progress of Recovery Strategy Implementation for the Northern and Southern Resident Killer Whales (Orcinus orca) in Canada (for the Period 2015 to 2019)* provides a recent example.

Areas of Focus

- Plan and manage human activities in a comprehensive manner while considering all factors necessary for the conservation and sustainable use of marine resources and the potential to impact marine mammal populations.
- Work towards management decisions take into account changes in the ecosystem which may affect the species being fished, including the effects of weather and climate, and the interactions of target fish stocks with predators, competitors, and prey species.
- Put in place measures that are adaptive and flexible, and that are responsive to monitoring and research results.
- Apply conservation measures necessary to maintain biological diversity and productivity of the marine environment, including minimizing the impacts of human activities on marine mammals, and the establishment of marine protected areas.
- Align management efforts with SARA objectives and recovery planning processes.

OBJECTIVE 2
Conserve | Management Actions & Programs

Marine Spatial Planning (MSP)

MSP is a collaborative process that brings federal and provincial governments, Indigenous communities as well as organizations, and stakeholders together to coordinate the collective use of marine spaces to achieve ecological, economic, cultural and social objectives. Marine spatial planning considers the range of human activities planned for a given marine area over time (such as fishing, cultural uses, conservation areas, energy development, etc.) to keep our oceans healthy and productive for generations to come.

DFO's Marine Planning and Conservation group works in collaboration with the Province of BC, Indigenous groups, and stakeholders to examine the impacts of human activities on marine ecosystems, drawing on Indigenous and scientific knowledge as sources of information.

Marine Protected Areas

There are currently 14 *Oceans Act* Marine Protected Areas (MPAs) across Canada, comprising over 350,000 km2 or roughly 6% of Canada's marine and coastal areas. MPAs contribute to a healthy marine environment and offer a nature-based solution to address the impacts of climate change by protecting marine ecosystems, their habitats and species. MPAs also contribute to Canadian culture while supporting the economic prosperity of local economies and coastal communities.

The Government of Canada, the Province of British Columbia and coastal First Nations are working together to develop a planned approach to a marine protected area network in the Northern Shelf Bioregion, a priority of the Pacific North Coast Integrated Management Area Plan signed in 2017. Work is also underway in the early planning (knowledge-gathering) phases in Southern British Columbia.

Incident Response

DFO's Marine Mammal Response Program supports marine mammal incident response. In collaboration with non-governmental organizations, experts in the department on the Pacific coast respond to dead or distressed marine mammals, including large whale entanglements, entrapments, live stranding or dead marine mammals. This program works with partners to:

- track and respond to marine mammal entanglements, strandings (dead and live), ship strikes, and other threats;
- quantify threats affecting marine mammal species, with a special focus on species assessed as at risk; and
- provide data and information to support species at risk recovery planning initiatives, mitigation options, and policy development.

Responding to live marine mammal incidents is important in reducing threats of injury and death, and in turn contributes to the health of individuals and the long-term success of the species. Trained members of the Marine Mammal Response Program and response equipment are located throughout the Pacific Region for quick response to any marine mammal incidents that may occur. However, this should only be done by experts as marine mammals can be unnecessarily harmed by well-intentioned actions of untrained persons trying to rescue or rehabilitate an animal, and further, this can also present dangers to humans.

Decisions regarding which actions are taken for a particular incident depend on several factors including species vulnerability (e.g., SARA listed and/or COSEWIC assessed as a species at risk), condition of the animal, evidence of human interaction, feasibility and logistics of collection or response, research interest, funding and the availability of the required personnel.

Upon completion of a response or investigation, data is compiled into a central database, samples are submitted for further analyses and all those involved in the response and related fields of study are notified of results. Documenting these incidents and in the event of mortality, understanding cause of death, contributes to the understanding of the major anthropogenic threats effecting the recovery of marine mammal populations.

It should be noted that reported marine mammal incidents are only a portion of the actual number of marine mammal incidents that occur.

OBJECTIVE 2
Conserve | Management Actions & Programs

Returning live-stranded animals safely to their natural habitat is dangerous work that requires the response of trained and authorized professionals.

Incident Response *continued...*

Cetacean Strandings

Cetaceans are considered to be stranded when they are located on a beach and are unable to return to water. Cetacean live strandings occur every year in BC with a range of 10-30 incidences per year over the past 10 years. Strandings of multiple animals occurring simultaneously in a defined area are known as mass strandings.

There are several potential anthropogenic causes of strandings including active sonar, seismic activity, gear entanglements, vessel/propeller strike causing injuries, and contaminants. Natural/non-anthropogenic stressors include harmful algal blooms, disease, and geographic features. For example, certain beaches which gently slope into the ocean have been found to adversely affect the ability for echolocation clicks to reflect back to the animals causing animals to swim right onto the beach before they can react and change direction. Cetacean foraging attempts in shallow water and escaping predation are common natural causes of cetacean live strandings.

Live-stranded animals may require professional assistance to return safely to their natural habitat. This work is dangerous, and in all cases, trained and authorized professionals work together to respond to stranded marine mammals. In determining the best course of action, the DFO Marine Mammal Response Program considers the location, weather, species, and number of animals involved before deploying the proper personnel and equipment (such as slings and re-floatation devices) needed for each response effort.

Rehabilitation

Vancouver Aquarium Marine Mammal Rescue Society is Canada's only dedicated marine mammal rescue facility and amongst the largest in the world. The centre works as a hospital and care facility for sick, injured or orphaned marine mammals. Each year, the rescue program saves over 100 marine mammals and rehabilitates them for release back into their natural habitat.

Necropsies

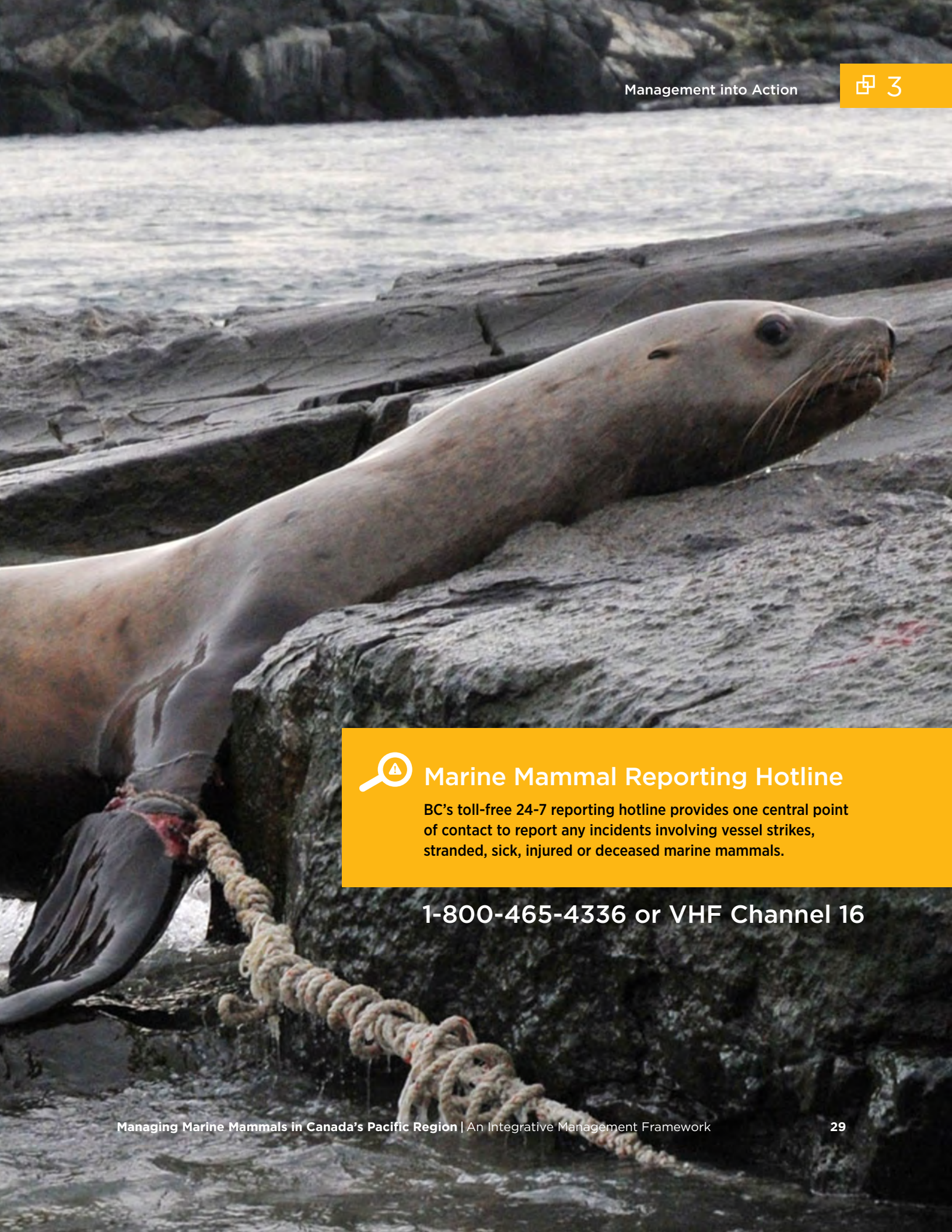
The purpose of marine mammal necropsies (animal autopsies) is to provide information about the cause of death such as the potential origin of a health issue or a threat to a population. Samples that offer information on reproductive status, life history, physiology and anthropogenic stressors are also gathered.

The Marine Mammal Response Program works closely with veterinary pathologists at the BC Ministry of Agriculture and Food to undertake necropsies. The team also works with trained volunteers to collect morphometric measurements and samples on animals that are in remote areas or too decomposed to warrant a full necropsy. In a typical year, necropsies are conducted on 10-20 large whales and 40 smaller marine mammals. About 20 percent of the necropsies are conducted in the field—generally on the large whales, which are too big for transport—and the remainder are done in the BC Ministry of Agriculture lab under controlled conditions with better equipment and technical support.

Sometimes there are unique cases where there is a significant die-off of a marine mammal population that needs to be investigated. DFO works with U.S. partners, including NOAA the Washington Department of Fish and Wildlife and Alaska Department of Fish and Game to closely monitor and better understand these events.

Link for more information

BC Marine Mammal Incident Reporting



Marine Mammal Reporting Hotline

BC's toll-free 24-7 reporting hotline provides one central point of contact to report any incidents involving vessel strikes, stranded, sick, injured or deceased marine mammals.

1-800-465-4336 or VHF Channel 16

OBJECTIVE 3

Protect

Minimize threats to marine mammals and their habitat.

Context

An increase in human activities in our waters is causing marine habitat alteration or destruction, resulting in serious impacts on the health of marine mammal populations and threats to the survival and recovery of at-risk species. This section identifies how the primary threats of concern identified below are being addressed through management actions and programs and the key regulatory tools in effect to minimize them.

Primary threats of concern:

Climate-related Changes • Understanding how ecosystem shifts resulting from climate-related changes will influence migration patterns and abundances of certain marine species is integral to sustainable management practices. It is expected that as a result of increasing greenhouse gases Canada's oceans will become warmer, fresher, more acidic and less oxygenated over time.

Physical and Acoustic Disturbances • Physical disturbances and underwater noise are linked to a wide range of impacts on marine species. Since marine mammals depend on sound to find food, navigate and communicate, acoustic disturbance can affect individual marine mammals or entire populations.

Vessel Strikes • BC waters have high densities of marine mammals and marine traffic, increasing risks of vessel strikes which are recognized worldwide as a significant cause of mortality for cetaceans.

Prey Availability • Sufficient density, diversity and quality of prey is critical to support feeding requirements that sustain good health.

Fishing Interactions with Marine Mammals

- **Entanglements** of marine mammals in fishing gear can cause significant injuries, affecting their ability to swim and feed and can cause death.
- **Bycatch** is the unintentional capture of marine mammals by fishing and is the number one source of direct human-caused death and serious injury to marine mammals worldwide.
- **Depredation** is the removal of fish from fishing gear by marine mammals. This is a learned behaviour that's nearly impossible to stop once it starts, can lead to serious harm to marine mammal populations, and can impact a fishers' catch and damage gear.

Marine Pollution and Contaminants • More human activity on, in, or near our waters is contributing to an increase in pollution and contaminants with far-reaching impacts on the marine food chain. Given current low rates of reproduction and small population sizes for some species of marine mammals, threats to one individual can have significant long-term effects on whole populations.

Areas of Focus

- Apply conservation measures necessary to maintain biological diversity and productivity of the marine environment, including minimizing the impacts of human activities on marine mammals, and the establishment of marine protected areas.
- Minimize disturbance of marine mammals by mitigating human activities through the issuance of permits, authorizations and licences for certain activities.
- Provide expertise, equipment, and capacity to respond to marine mammal incidents such as entanglements, stranding, and the delivery of necropsies, including support to the Marine Mammal Response Program in collaboration with Indigenous groups, conservation groups and Environmental Non-Governmental Organizations.
- Support the conservation and protection of marine mammal habitat, including prey availability for species of cetaceans listed under SARA.
- Recognize the impact of environmental contaminants on marine mammals and their environments, including processes underway to develop and implement regulations or guidelines to reduce the threat of contaminants, while also conducting research and monitoring to further our understanding of their impacts.

Understanding how climate-related changes to the ocean are impacting the health of marine mammal populations is integral to sustainable management.

Understanding Climate-related Impacts on Marine Mammals

Understanding climate-related impacts on marine mammal populations is complex, variable and challenging. It is expected that Canada's oceans will become warmer, fresher, more acidic and less oxygenated as a result of the increasing greenhouse gases in the atmosphere. Increasing human interactions in our waters is influencing climate-related impacts on marine mammals. These impacts can be cumulative over time and the ability of species to withstand these pressures is also uncertain.

DFO studies climate changes through research and ecosystem programs and shares information through the *State of the Pacific Ocean* report. These research activities study certain marine mammal species to better understand how climate-related changes are influencing conditions of marine and fresh water environments, migration patterns and abundances, prey availability, and impacts on overall health and survival. Some of this work includes:

- Monitoring the physical, biological, chemical conditions in marine and fresh water environments
- The Strait of Georgia Ecosystem Research Initiative
- Fraser River Watershed Watch

OBJECTIVE 3
Protect

Management Actions & Programs

Physical and Acoustic Disturbance

Marine mammals are dependent on sound to conduct life processes. Impacts from this noise may affect individual animals or entire populations differently, but underwater noise has been linked to a wide range of impacts on marine species, including:

- disrupting normal behaviour,
- change or loss of habitat,
- masking sounds, affecting marine ability to communicate,
- changes in physiology, behaviour and/or stress levels,
- permanent injury or even death, and
- can mask ability to forage or hunt.

Some key habitat overlap with locations that are used heavily by humans results in physical disturbance due to anthropogenic noise from vessels, aircrafts, and industrial activities such as dredging, pile driving, other construction activities, seismic testing, and sonars. Additionally, noise travels differently in different temperatures of water, and changes in local climates effect how sound travels underwater.

Vessel use and human presence cause physical disturbance, and in some cases have been linked to behavioural changes in marine mammals, including impacting their foraging efficiency and success. Even human-powered vessels such as canoes or kayaks can disturb, stress or prevent whales from feeding.

The *Marine Mammal Regulations* and prohibitions under SARA specifically prohibit the disturbance, harm, and harassment of killer whales, and non-compliance can lead to charges. These prohibitions are augmented by guidelines for marine mammal viewing in the Be Whale Wise: Marine Wildlife Guidelines for Boaters, Paddlers and Viewers, which are available in hard copy from local DFO Offices or online.

Marine Environmental Quality Initiative (MEQ)

Human activities in or near the ocean can introduce stressors like noise into the marine environment, potentially disrupting marine species and their ecosystems, and reducing their ability to travel, communicate, and find food. To preserve the quality of the marine environment, the Government of Canada is collaborating with key partners to:

- Identify and understand ecological stressors, such as human-produced underwater noise; and,
- Develop and improve measures to mitigate the impacts of human activities on the health and quality of our oceans, including impacts to whales and other marine species.

Underwater ocean noise has been identified as a stressor for several species of marine mammals. The MEQ is focused on understanding and addressing marine stressors including underwater ocean noise and its effects on marine mammals and their habitat. Specific MEQ actions include analyses of existing mitigation strategies, identification of potential management gaps and adjustment of existing measures or development of new management tools under the Oceans Act (e.g., criteria, guidelines, objectives, standards and regulations) to address management concerns and to provide direction and greater certainty to industry and ecosystem users.

The Marine Environmental Quality Initiative is also working with federal, provincial, territorial and Indigenous partners, and stakeholders to address underwater noise in Canada's marine ecosystems through the development of an Ocean Noise Strategy for Canada. The Ocean Noise Strategy for Canada will define the Government of Canada's vision and guide future federal efforts to address priority underwater noise issues. This includes establishing a whole-of-government approach and long-term plan to guide federal science research, technology development and the management of human produced marine noise in Canada's oceans. The Strategy will also help to further coordinate and integrate collaborative efforts on ocean noise.

As part of this initiative, DFO is also working with partners to research and better understand how vessel-related noise affects whales by establishing current ambient underwater noise levels in these whales' habitat, and exploring the impact of ecological stressors on marine ecosystems, including mammals.

DFO's Fish and Fish Habitat Protection Program (FFHPP)

FFHPP is responsible for the administration of the fish and fish habitat protection provisions of the *Fisheries Act* and relevant provisions of the SARA. The Program carries out a number of activities in support of the conservation and protection of Southern Resident killer whale and their primary prey (Chinook). FFHPP also conducts regulatory reviews of projects taking place in and around fish habitat, develops guidance and best management practices, conducts

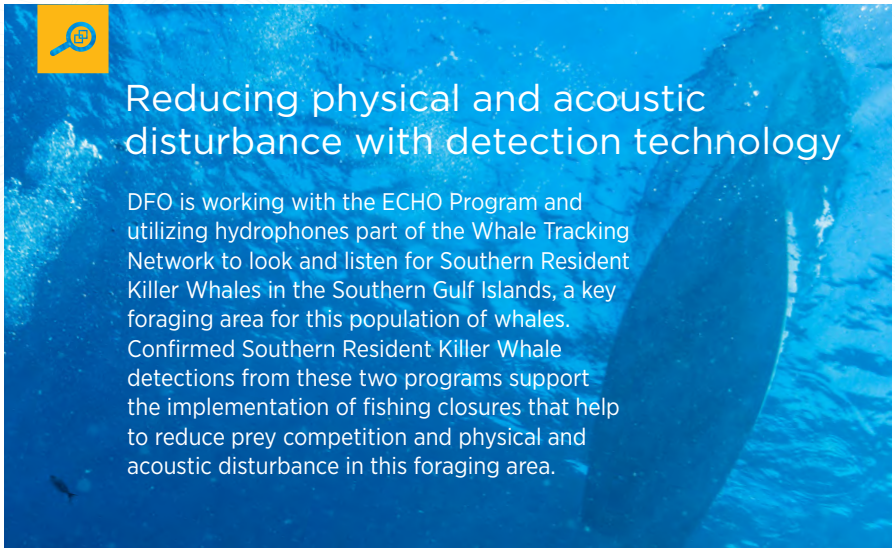
OBJECTIVE 3
Protect | Management Actions & Programs

Physical and Acoustic Disturbance *continued...*

compliance monitoring and supports activities for compliance and enforcement carried out by DFO's Conservation and Protection (C&P) Directorate.

FFHPP reviews development projects, many of which have the potential to generate underwater noise that may result in damage and mortality to fish, including marine mammals. As part of efforts to mitigate the impacts of these activities, regional guidance has been developed for acoustic thresholds and monitoring protocols.

Although measures are in place to reduce physical disturbance and noise in whale habitat, monitoring and understanding the impact of these efforts is difficult. For example, analyzing the effects of any noise level reduction (e.g. average or median ambient sound reduction) requires monitoring for an extended period of time after the reduction is implemented to determine if there has been a positive effect for the whales. Even if this is accomplished, it is still challenging to determine if a reduction has had a positive effect on whales population in a specific area, as there are a number of other environmental factors, such as changes in food presence, that may impact whale presence in an area. Risks and recommendations of avoidance and mitigation measures to conserve and protect fish and fish habitat are determined by sensitivity of species, rarity of habitat, and threats to recovery. Compliance monitoring is carried out to ensure compliance with the *Fisheries Act* and conformity with advice.



When proponents are unable to completely avoid or mitigate impacts to fish and fish habitat, their projects require authorization under the *Fisheries Act*. If the project is likely to result in an impact to Species At Risk prohibited under the SARA, FFHPP will consider whether permitting conditions of the SARA can be met prior to issuance or refusal of an authorization. Authorizations include terms and conditions that proponents must follow to avoid, mitigate, and offset (i.e. counterbalance impacts) impacts to fish and fish habitat and to minimize impacts to species at risk and their habitat.

Vancouver Fraser Port Authority's Enhancing Cetacean Habitat and Observation (ECHO) Program

This program was launched in 2014 to better understand and reduce the cumulative effects of shipping on whales throughout the southern coast of British Columbia. The port authority recognizes that commercial marine activity in the region is increasing, and has the potential to impact at-risk whales. The Vancouver Fraser Port Authority is responsible for stewardship of the lands and waters that make up the Port of Vancouver's jurisdiction in and around Vancouver, British Columbia.

ECHO Advisory Working Group

Established in 2018, this working group leverages existing partnerships through advisory groups and committees to develop and implement mitigation measures to reduce underwater vessel noise associated with Large Commercial Vessels through voluntary measures such as slow-downs and lateral displacement in shipping lanes to reduce acoustic impacts in key marine mammal habitat.

OBJECTIVE 3
Protect

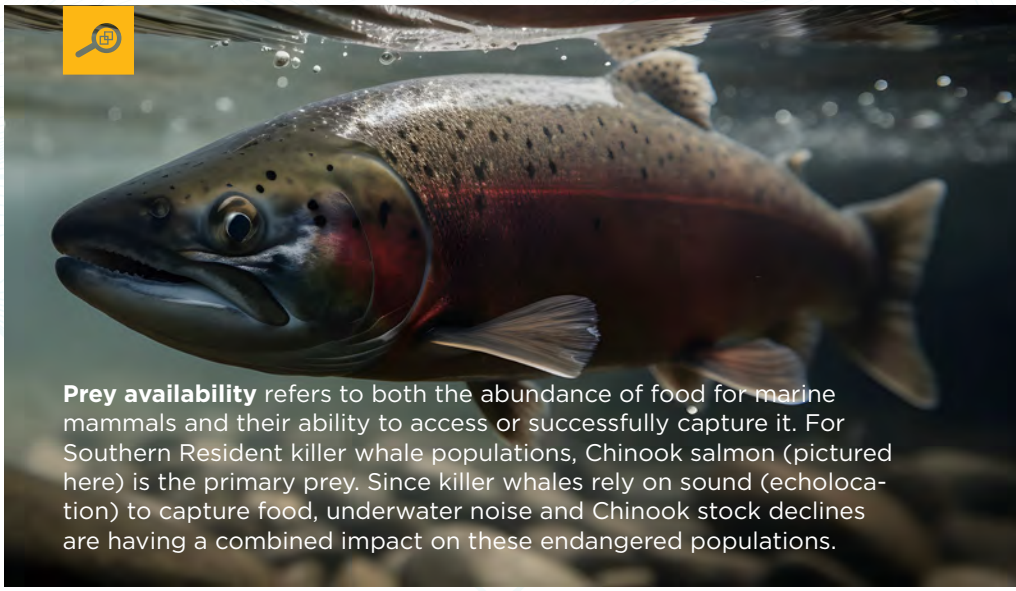
Management Actions & Programs

Vessel Strikes

Each year, cetacean-vessel strikes are reported to the DFO BC Marine Mammal Response Network hotline. These include collisions with species at risk like killer whales, humpback whales, grey whales, and fin whales, as well as smaller marine mammals like Pacific White-sided dolphins, Dall's porpoises and Harbour porpoises. The majority of reported strikes involve small vessels (less than 15 m); however, strikes from larger vessels are less likely to be detected, and therefore are likely underreported. Humpback whales are the most commonly struck cetacean in BC due to their relative higher abundance and their tendency to feed at or near the surface (Laist et al., 2001). Fin whales are the most commonly struck cetacean species worldwide, and are commonly distributed along the shelf break in locations that frequently coincide with shipping lanes (Gregr et al., 2006). The endangered blue whale is also particularly vulnerable to ship strikes due to their tendency to feed at the surface and their slow and shallow dive response to vessels.

WhaleReport Alert System (WRAS)

In 2018, the B.C. Cetacean Sightings Network launched the Whale Report Alert System (WRAS) alert system that broadcasts pertinent details of whale presence to large commercial vessels. Whale presence information from real-time observations is reported to the B.C. Cetacean Sightings Network via the WhaleReport app. These alerts inform shipmasters and pilots of cetaceans in their vicinity which better enables vessels to take mitigation measures, such as slowing down or altering course to reduce risks of collision and disturbance.



Prey availability refers to both the abundance of food for marine mammals and their ability to access or successfully capture it. For Southern Resident killer whale populations, Chinook salmon (pictured here) is the primary prey. Since killer whales rely on sound (echolocation) to capture food, underwater noise and Chinook stock declines are having a combined impact on these endangered populations.

Prey Availability

The recovery of marine mammals can be limited by reduced prey sources. Prey availability includes the abundance of prey and their accessibility. Prey availability also depends on prey density and quality, as well as a sufficient diversity in space and time across the year to maintain availability. Chinook salmon, for example, are the primary prey of Southern Resident killer whales. Sufficient diversity of Chinook stocks with a variety of spatial and temporal migration patterns are required to maintain availability throughout the year (DFO, 2017).

Prey accessibility relates to the ease of obtaining prey and can be affected by physical or acoustic disturbance that can impact cetacean foraging success. Disturbance can be caused by the presence of vessels, and the underwater noise that they cause.

Reducing the frequency of physical and acoustic disturbances may facilitate improved foraging success and thereby may lead to better physical condition and higher survival and birth.

For species that utilize echolocation such as Southern Resident killer whale, minimizing acoustic interference with echolocation during hunting and communication between pod members would minimize physical interference from vessels that may disrupt surface chases, preclude prey sharing, or cause animals to cease foraging and move out of an area.

Recent and ongoing research will further our understanding as DFO and other researchers continue to advance new scientific information and analyses regarding distribution, prey and foraging requirements.

OBJECTIVE 3
Protect

Management Actions & Programs

Fisheries Management

DFO takes an ecosystem-based approach to oceans management and to fisheries management decisions to protect sustainable, healthy and productive aquatic ecosystems.

Fisheries are managed in accordance with the *Fisheries Act*, using credible, science-based, affordable and effective practices. DFO bases management decisions on the precautionary approach and best available information, including peer-reviewed science and Indigenous Knowledge.

As part of measures to mitigate the threat of reduced prey availability to Southern Resident killer whales, fishery management measures include closures to help increase the availability of salmon, reduce prey competition and decrease vessel disturbance in key Southern Resident killer whale foraging (feeding) areas off the west coast of Vancouver Island (Swiftsure Bank), the Juan de Fuca Strait, the Gulf Islands, and at the mouth of the Fraser River within Southern Resident killer whale critical habitat.

These annual fishery management measures include area-based fishery closures for recreational and commercial salmon fisheries. In addition, Fishers are also asked to voluntarily stop fishing (do not haul gear) within 1000m of killer whales as a best practice to reduce competition for their food and disturbance in their presence.

Salmonid Enhancement and Habitat Restoration

Fisheries and Oceans Canada seeks to conserve existing fish and fish habitat resources, protect these resources against future impacts, and restore fish habitat. Canada's *Fisheries Act* and SARA provide a legal basis for conservation and protection of fish, aquatic species at risk, and their habitats.

Pacific Salmon Strategy Initiative, Stewardship Directorate, Salmon Restoration Centre of Expertise

The Salmon Habitat Restoration Centre of Expertise advances habitat restoration in accordance with strategic direction and priorities.

The Centre of Expertise area-based operation teams deliver planning, implementation and monitoring of salmon habitat restoration projects throughout the Pacific Region. The Centre of Expertise regional teams provide guidance, expertise and consistent protocols to area teams throughout the region.

Chinook habitat restoration projects that support Southern Resident killer whale recovery have been funded though Government of Canada initiatives such as the Ocean Protection Plan Coastal Restoration Fund, the co-funded British Columbia Salmon Restoration and Innovation fund and more recently, the Aquatic Ecosystem Restoration Fund. These projects are supported by the Centre of Expertise operational unit engineers and biologists in partnerships with Indigenous groups and other stakeholders.

Forage Fish

A forage species is a species which is below the top of an aquatic food chain, is an important source of food for at least some predators, and experiences high predation mortality. Forage fish are important to whale populations especially when they are being consumed directly as prey, for example, forming the majority of Humpback whale's diet, or prey for salmon, such as Chinook salmon for Resident Killer Whales.

From a fisheries management perspective the species will fully recruit to the fishery at ages which still experience high mortality due to predation. Forage species often undergo large natural fluctuations in abundance in response to environmental factors, on time scales comparable to or shorter than a generation. Forage species often support dependent predators, which are species that obtain a significant part of their annual food ration from the forage species. When the forage species declines markedly in abundance (whether due to natural causes or over-exploitation) the dependent predator is likely to show biological responses such as major changes in diet, reduced growth rate and fat storage, reduced reproductive success and/or delayed maturation, and changes in normal seasonal distribution patterns.

To support management of forage fish species, DFO has developed a policy on forage fish species which outlines principles, as well as management objectives and considerations for fisheries that harvest forage fish such as herring and pacific sand lance.

OBJECTIVE 3
Protect | Management Actions & Programs

Fisheries Interactions with Marine Mammals

Entanglements

Canada's coastline is the world's longest, measuring 243,042 km (includes the mainland coast and the coasts of offshore islands). Since so much of the coast is remote, there are limited sightings or reportings of whale entanglements.

Entanglement of marine mammals in commercial fishing, fixed recreational gear, and aquaculture gear (both active and derelict) can cause significant injuries, affecting their ability to swim and feed, and in some cases, can even cause death.

Whales can also be entangled and anchored in place by fishing gear such as crab and prawn traps and aquaculture gear, causing them to drown. Chronic entanglements may not be lethal, but can still impact life processes, such as feeding, breeding, migration or calf-rearing.

Marine Mammals that are reported entangled in fishing gear are responded to by specialized teams and individuals within Canada and when possible through DFO's Marine Mammal Response Program.

Marine Mammal Response Program

This Program plays a lead role for responses involving disentanglements of all cetaceans in the Pacific region and works with trained staff at Vancouver Aquarium Marine Mammal Rescue Society for pinniped disentanglements.

DFO works with external partners including Straitwatch, ENGOs, the wild capture fishing and aquaculture industries, and academia on a range of mitigation and response initiatives including education and outreach, surveillance, reporting and response. For example, there is research focused on reducing the breaking strength of fixed gear fishing rope or inserting weak links to reduce the chance of serious injury or death. For aquaculture sites, there are now requirements to remove gear that is considered to cause increased entanglement risk to marine mammals.

Cetacean disentanglement efforts may begin with deployment of a satellite tag in order to track and locate the animal while a response is planned and executed. Satellite tagging requires immediate response and must be handled by trained personnel. Disentanglements are undertaken only by certified trained teams. In recent years the Marine Mammal Response Program has conducted a number of satellite tag training sessions throughout the BC coast with First Nations communities and other partners, to improve satellite tag response time and increase coastal coverage.

Rescues of entangled animals prevent further injury or death due to starvation, infection or drowning. Disentanglement response is also expensive and dangerous. Human safety, environmental limitations including weather, nightfall, sea state, or the inability to track a transiting whale are important considerations for rescue work.

Marine Mammal Bycatch

Marine mammal bycatch is defined as the incidental capture, injury, or death of a marine mammal from fishing activities. Bycaught marine mammals can become entangled, injured, or stressed, and even quick removal or escapement from fishing gear can cause injury. Estimated at over 650,000 individuals each year, bycatch is the world's number one source of direct human-caused death and serious injury to marine mammals.

The term bycatch as it relates to the commercial wild capture fishing sector refers to a fish (non-target) or other marine species being caught unintentionally while fishing for a certain target species.

In Canadian Pacific waters, fishing activities can take place in marine mammal habitat. Marine mammals can be exposed to fishing gear during their migration, while foraging, mating and calf-rearing, which can expose them to different types of fishing gear in different areas.

Interactions vary depending on behaviour and how long marine mammals stay in an area, on the nature and gear type being used, and amount of gear present. In Canada, management of bycatch in fisheries has been an important component of many fisheries management plans for a long time.

Fishing gear and harvesting practices have evolved to improve the selectivity of fishing, and efforts have been made to maximize the potential for survival of catch that is returned to the water.

The *Policy on Managing Bycatch* has two objectives: to ensure that Canadian fisheries are managed in a manner that supports the sustainable harvesting of aquatic species and that minimizes the risk of fisheries causing serious or

OBJECTIVE 3
Protect | Management Actions & Programs

Bycatch is the number one source of human-caused death or serious injury to marine mammals world-wide.

Fisheries Interactions with Marine Mammals *continued*

irreversible harm to bycatch species; and to account for total catch, including retained and non-retained bycatch. Canadian fisheries are required to meet regulatory provisions under legislation, policies, and conditions of licence, which include monitoring, reporting, and mitigation measures to reduce the risk of incidental harm to marine mammals.

In recent years, new regional, national and international requirements have come into effect for strengthened monitoring and reporting tools that provide important data on which fisheries present the highest risk of interactions with marine mammals.

Commercial fishing licences set out specific provisions that support marine mammal management. These include monitoring requirements with use of logbooks, at-sea-observer coverage and electronic monitoring, as well as mitigation measures such as gear marking and reporting requirements for all fishery-related interactions with marine mammals. Fisheries conditions of licence also specify completion and submission of Marine Mammal Interaction Reporting Forms upon accidental interactions between gear or vessels and marine mammals. Reporting of interactions is channeled through appropriate hotlines. Reporting incidents assists DFO and fish harvesters in understanding this problem and helps to develop strategies to avoid it.

Nuisance Seals

Marine mammal predator control is governed nationally by the *Marine Mammal Regulations* under the *Fisheries Act*, and under this legislation the lethal removal of nuisance seals is strictly prohibited. The Government works with industry to develop and improve measures to prevent interactions and control predators.

Depredation

Depredation is the removal of fish from fishing gear by marine mammals. This learned behaviour can spread throughout whale social groups and populations of pinnipeds (i.e. seals and sea lions) and once it starts it is impossible to stop. It can also lead to harm of marine mammals.

Depredation has been reported by harvesters in BC and in some fisheries, marine mammals are known to regularly remove catch or bait from fishermen's lines or nets, and aquaculture pens.

Depredation can significantly affect the volume and quality of catches and also increases the likelihood of entanglement or hooking of marine mammals. To prevent significant losses for harvesters, it is critical that harvesters not encourage this learning by allowing marine mammals to associate with them during fishing activities. To prevent depredation behaviour from spreading it is critical to not feed whales directly or indirectly, or haul gear in the vicinity of marine mammals. Typically, marine mammals pass quickly through an area allowing fishing to resume. When depredation is experienced by a harvester it is also recommended that other harvesters in the area be advised.

Predation at Aquaculture Facilities

Marine mammals have been known to interact with aquaculture facilities in BC coastal waters. National and provincial regulations require finfish aquaculture license holders to take all reasonable measures to reduce incidental catches of wild fish and minimize interactions with predators.

Operators of marine net pens use protective nets to discourage birds of prey, and may use double-walled pens, anti-predator netting, fencing, or knee barriers to prevent marine mammals like seals, sea lions, or sea otters from predating shellfish aquaculture facilities.

Marine mammal predator control is governed nationally by *Marine Mammal Regulations* under the *Fisheries Act*, and under conditions of license. DFO works with industry to develop and improve preventive measures to control predators. At present, the most common system includes anti-predator netting that surrounds the facility structure on all sides and from below. DFO conducts site audits and inspections to ensure license holders comply with license conditions.

OBJECTIVE 3
Protect

Management Actions & Programs

While marine mammals must come to the surface to breathe, they have little to no sense of smell, making them especially vulnerable to oil spills.

Contaminants

Chemicals and biological pollutants may directly or indirectly impact marine mammals. These include persistent organic pollutants (POPs) such as polychlorinated biphenyls, current-use pesticides, and metals. These are harmful to the health of marine mammals and can cause damage to nervous systems, or impact immune systems making them more susceptible to disease, or impair reproductive capabilities.

Pollutants that bioaccumulate or are capable of biomagnification through the food chain are of particular concern to marine predator species.

Contaminants of concern are characterized through research and monitoring and often identified in species-specific SARA Recovery Strategies.

All levels of government and external partners work together to address threats of contaminants to the marine environment and the Government of Canada continues to address these threats by strengthening regulations, developing guidelines, and increasing research and monitoring.

The Pollutants Affecting Whales and their Prey Inventory Tool (PAWPIT) is an online interactive mapping tool that shows estimates of pollutant releases by all identified sources within certain habitats of Northern and Southern Resident killer whales and Chinook salmon. The tool also displays estimated ambient contaminant loads in the Fraser River Basin, and indicates where environmental quality guidelines were exceeded.

Marine Pollution Events: Chemical and Oil Spills

Chemical and oil spills are a major threat to marine mammals. Given current low reproduction rates and small population sizes for some species of marine mammals, impacts on individuals can have significant longterm effects on whole populations.

Marine mammals must also interact with the surface to breathe and yet they do not appear to avoid areas affected by oil, making them particularly vulnerable to oil spills. This lack of avoidance may be a result of little, if any, sense of smell.

Many marine mammals and species at risk — sea otters in their rafts, Steller sea lions at their breeding rookeries, Offshore killer whales, and Southern Resident killer whales — are often found in very large groups with a large proportion of the population concentrated in a relatively small area.

If a chemical or oil spill occurs in a small area populations are at risk of being significantly impacted. Because of the risk of exposure through ingestion, inhalation, or direct contact, actions must be considered to deter marine mammals from entering oil spill locations.

Oil spills are detrimental to marine mammal populations for a number of reasons, including toxicity of oil vapour, which may cause respiratory distress when inhaled. Cetaceans exposed to oil have been shown to have reduced reproductive success and many long-term health effects that make them more susceptible to pathogens (Gregr et al., 2006).

Acute oil exposure can also result in lung, liver, and kidney damage. Oil spills can also significantly impact availability and quality of their prey, and ingesting oiled prey causes serious long-term damage to internal organs (Rosenberger et al., 2017).

OBJECTIVE 3
Protect

Management Actions & Programs

When marine mammals are involved in marine pollution incidents, DFO's Marine Mammal Response Program plays a lead role on the water.

Emergency Response to Marine Pollution Incidents

Response protocols and training programs are in place to manage impacts from marine pollution incidents on marine mammals. .

DFO's Spill Response Program

DFO's Integrated Marine Response Planning Program is activated during marine spills. Environmental Incident Coordinators (EICs) are responsible for coordinating all scientific and technical information to inform response actions. All DFO branches may be involved including: Ecosystem Management Branch, Science, Conservation & Protection and FIsheries Management Branch.

DFO provides scientific and technical advice and recommendations to the Federal Agency Authorized to Lead the Response. DFO's expertise on fish and marine mammals, aquatic species at risk, fish habitat and fisheries includes:

- Identification of sensitive species including species at risk and their habitat, including critical habitat
- Assessing the nature and extent of impact on species and habitat
- Assessing potential socio-economic impacts
- Advice on environmental impact assessments
- Monitoring impacts on fish and fish habitat, and remediation plans
- Integrating new research outcomes into spill response operations

Environment and Climate Change Canada (ECCC) coordinates all federal scientific and technical advice and expertise and provides it to the lead agency in charge of managing the spill. Information about species, habitats, fisheries, wildlife, oceanographic data and modeling informs operational priorities and activities.

Environment and Climate Change Canada's National Environmental Emergencies Centre (NEEC) is the federal focal point for scientific advice and technical support for environmental emergencies and offers services for effective incident management 24/7.

The Canadian Coast Guard (CCG) is the Lead Agency responsible for responding to all ship-source marine oil spills. CCG is the federal lead for operations planning and implementation of marine spill response activities. This includes liaising with First Nations and the polluter responsible for the spill, and leading development of broad-scale Area Response Plans (ARPs) to define roles and responsibilities of spill response partners.

Marine Mammal Response Program

DFO's Marine Mammal Response Program plays a lead role when a marine pollution incident requires on-water response involving marine mammals. This role is a coordinated effort with Canadian Coast Guard and support from Conservation and Protection officers.

DFO's sighting reports, aerial surveillance and other available data determine presence and movement of marine mammals. This information is integrated into the response plans.

If marine mammals are detected in spill areas, deterrence experts are deployed to prevent marine mammals from travelling into the spill areas.

Toxicity of the spilled chemical determines marine mammal response actions taken. In the event of a significant petroleum discharge, spill trajectory projections and marine mammal location and movement data are analyzed to determine threats of oil exposure.

OBJECTIVE 3
Protect | Regulatory Tools

Marine Mammal Regulations

Marine Mammal Regulations provide direction on conservation and protection of marine mammals, guidance for recovery of at-risk species under the SARA, and set out provisions related to reducing human disturbance of marine mammals (e.g. viewing of marine mammals) and mandatory reporting requirements in the case there is accidental contact with a marine mammal and a vessel or fishing gear. Amended in 2018, these now specify mandatory requirements to prevent disturbance of marine mammals.

Section 7(2) of the regulations defines disturbance as a range of human actions:

- Feeding, swimming or interacting with a marine mammal.
- Moving a marine mammal (or enticing/causing it to move).
- Separating a marine mammal from its group or going between an adult and a calf.
- Trapping a marine mammal or a group between a vessel and the shore, or between a vessel and other vessels.
- Tagging or marking a marine mammal.

Section 8.2 of the regulations identifies approach distances

Boats are required to maintain a minimum approach distance of 100 m for whales, dolphins or porpoises, 200m when whales, dolphins or porpoises are in a resting position or with a calf, and 200m from all Killer Whales in Pacific Canadian waters. However, when in southern BC coastal waters a 400m minimum approach distance to all killer whales is required as per the Interim Order enacted under the *Canada Shipping Act, 2001*.

Permits and Licenses

DFO regulates and/or permits research projects and development projects involving marine mammals including research, transport, rehabilitation, possession, and or works, undertakings or activities related to development projects, amongst others. Authorizations, permits and licenses are issued under the authority of the *Fisheries Act*, the SARA, the *Fisheries (General) Regulations*, and the M*arine Mammal Regulations*. Applications for permits, are thoroughly assessed to eliminate or minimize human impact to marine mammals through a series of conditions pending the nature of the activity. Additionally, the cumulative nature of these activities can be considered through these processes, such as the Southern Resident killer whale licence review panel to ensure impacts are being considered across these activities and collectively.

Research or development projects conducting activities with the potential to affect marine mammal species listed as 'Endangered' or 'Threatened' under SARA require a stand-alone SARA permit, a *Fisheries Act* authorization acting as a SARA permit, or, under certain conditions a *Fisheries Act Fisheries (General) Regulations* fishing licence acting as a SARA permit.

Development projects that affect marine mammal species that are not SARA-listed as 'Endangered' or 'Threatened' may require a *Fisheries Act* Authorization if there is potential for death or harmful alteration, destruction or destruction of habitat. In other circumstances, a Marine Mammal License or Authorization is required under the authority of the Fisheries (General) Regulations and *Marine Mammal Regulations*.

The DFO permit application includes an impact and mitigation assessment to ensure all steps have been taken to minimize potential disturbance, harm and anthropogenic effects. Permits and licences are issued on a one to five year basis, and require the submission of an annual report to allow for review of activities and outcomes, as well as consideration of cumulative impacts of activities. When a SARA permit or *Fisheries Act* fishing licence or authorization acting as a SARA permit is issued, an explanation for why it was issued must be posted on the SAR Public Registry. If the activity is deemed redundant or overly harmful, the permit or authorization may be amended or revoked.

For works, undertakings, or activities related to development projects, the Minister must consider a number of factors prior to deciding whether to issue the *Fisheries Act* Authorization such as: Fisheries Management Objectives, the measures and standards in place to avoid or mitigate the extent of harm, cumulative effects, Indigenous Knowledge, and whether offsetting gives priority to the restoration of degraded habitat. Information requirements and timelines are specified in the Authorizations Concerning Fish and Fish Habitat Regulations.

For research activities, the pre-conditions for approval vary depending on the request. DFO requires all permit holders to obtain an Animal Care Permit or equivalent when the activity has the potential to disturb marine mammals, particularly if permission to capture or conduct invasive sampling is requested. Permit holders may also become certified through the Canadian Council on Animal Care (CCAC),

OBJECTIVE 3
Protect | Regulatory Tools

a national organization that mandates the appropriate and ethical treatment and care of animals during scientific and recreational activities. The CCAC includes standards, guidelines, and regular peer review by the Canadian Council on Animal Care. The certification process of permit holders involves an assessment of the institution's animal ethics and care program, the effectiveness of their animal care committee to oversee the program, and the appropriateness of their animal facilities, practices, and procedures.

As of March 2021, around sixty cetaceans are held in captivity in Canada. In June 2019, legislation was enacted under the *Fisheries Act* (s.23) aimed at phasing out the captivity of cetaceans in Canada, and DFO is developing a suite of permitting policies. The legislation specifies strict requirements including that a cetacean should not be fished for the purpose of captive display; a new captive cetacean should not be imported into Canada, except in special circumstances that could significantly benefit the cetacean's welfare or the conservation of wild species through scientific research; and new cetaceans should not be added to those already in captivity in Canada through reproduction.

All existing arrangements of cetaceans in captivity must be authorized by a licence issued to the relevant person or organization, including to conduct scientific research or for welfare purposes. Conditions under these licences are aimed at ensuring that the research program is valid and useful, that appropriate Animal Care and Use Protocols are in place when relevant, that the researchers have published relevant scientific articles, and that the objective of any research on cetacean reproduction that could be authorized is to support wild stock conservation, and not replenish captive stocks of cetaceans.

To export live cetaceans listed under the Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES), an export permit continues to be required. CITES export permits for aquatic species are issued by DFO on behalf of Environment and Climate Change Canada (ECCC), which is responsible for CITES in Canada.

Project Development: Reviews and Proposals

Marine mammal-related programming that results from major project review is often implemented in conjunction with other government agencies and where possible, aligned with existing programs. DFO contributes expert knowledge regarding marine mammals, their habitat, and best available science to design mitigation measures.

Following review of a proposed project, DFO may issue a *Fisheries Act* authorization and/or SARA permit(s), and the Government of Canada may create programs to monitor or mitigate potential impacts.

In effect since August 28th, 2019, provisions of the *Fisheries Act* outline protective measures for all fish, which includes fish and fish habitats, shellfish crustaceans, and marine mammals. Under these provisions, works, undertakings and activities that result in the harmful alteration, disruption or destruction of fish habitat are prohibited. The death of fish from activities, other than fishing, is also prohibited. This is complimented by the SARA which provides legislated protection for species at risk and their critical habitats in Canada. DFO also participates in federal impact assessments with other federal departments to ensure potential impacts of large projects on fish and fish habitat, marine mammals and aquatic Species At Risk are appropriately considered during the planning stage.

Objective 3 Links for More Information

CCG Area Response Plans (ARPs)

Port of Vancouver's Enhancing Cetacean Habitat and Observation (ECHO) Program

Be Whale Wise: Marine Wildlife Guidelines for Boaters and Viewers

Marine Mammal Transportation Licence

Policy on Forage Fish

Depredation

Reporting:

BC Marine Mammal Response Network

Fisheries Violations

OBJECTIVE 4
Support

Support Indigenous involvement in marine mammal management, including access for Food, Social and Ceremonial (FSC) purposes.

Context

Nations across the coast have a rich history with marine mammals, and DFO recognizes their culture, language, traditions, harvesting practices and rights of Indigenous Peoples. DFO works with communities to secure access to marine mammals, and discussions focused on sharing Indigenous Knowledge and western science in developing harvest plans, engaging in monitoring and stewardship.

Management and Harvest

The only harvest of marine mammals currently permitted in Canadian Pacific waters is for Food, Social and Ceremonial (FSC) purposes. In 1990, the Supreme Court of Canada issued a landmark ruling in the Sparrow decision. The Supreme Court found that where an Aboriginal group has a right to fish for Food, Social and Ceremonial purposes, it takes priority, after conservation, over other uses of the resource. In order to facilitate harvest, DFO works with Indigenous groups to determine key interests.

Part of the scientific information includes Potential Biological Removal (PBR) calculations — a management metric for determining the allowable harm to a particular marine mammal stock. PBR is defined as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.

Key considerations:
- Understanding Indigenous interests/preferences.
- Indigenous Knowledge
- Current scientific information: abundance, geographic range, Potential Biological Removal (PBR) calculations
- Location of proposed harvest
- Timing of proposed harvest
- Catch monitoring provisions
- Humane harvesting practices
- Populations structure
- Safety Requirements (food safety and safety of harvest)
- Gear type

Under SARA, allowable harm is considered the amount of annual harm, usually expressed in terms of mortality, that a population can withstand without jeopardizing survival and recovery of the species. Allowable harm is considered when issuing permits for activities affecting a species listed as Threatened, Endangered, or Extirpated under SARA, or any part of it's critical habitat.

Areas of Focus

- Consider opportunities for harvest for FSC purposes, after conservation priorities have been met.
- Use scientific evidence and Indigenous Knowledge when making marine mammal harvest decisions.
- Consider total impact of the fishery; not only on the target species, but also on non-target species, seafloor habitats, and the ecosystems of which these species are a part.

Link for more information

Supreme Court of Canada ruling in Sparrow Decision re: Canadian Food, Social and Ceremonial (FSC) harvest in Pacific region

OBJECTIVE 5
Sustain

Balancing sustainable marine economic sectors for Canadians, Indigenous and coastal communities with conservation and protection of marine mammals

Context

A recurring management theme is that our oceans and marine resources must be healthy to support a prosperous blue economy, while continuing to support industries that have traditionally relied on the ocean and its resources.

DFO recognizes that oceans provide jobs and are integral to the culture and identity of many Canadians. We support the development of economic opportunities that encourage ocean stewardship to conserve and sustain marine mammal populations in our Pacific waters. Canada has made historic investments in marine innovations for sustainability and ocean protection which have resulted in cleaner, more resilient coastlines and coastal communities, stronger partnerships with Indigenous communities, and have created opportunities for jobs and economic growth.

This objective outlines some of Fisheries and Oceans Canada's programs that are actively supporting sustainable economic growth and the mitigation of threats and potential impacts to a range of maritime sectors in the Pacific region, including: marine mammal viewing, commercial whale watching, commercial wild capture, recreational fishing, aquaculture, and marine development projects.

Areas of Focus

- Support sustainable economies in coastal communities that balance maritime activities and the protection of marine mammals.
- Promote technology transfer and innovation.
- Align and support DFO plans to develop an 'Ocean Plastic and Ghost Gear Management Framework'.
- Protect marine mammals against future impacts from development projects in habitats in accordance with fish and fish habitat protection provisions of the *Fisheries Act* and SARA.

Supporting Canadian Export Fisheries Under the Marine Mammal Protection Act

The U.S. is Canada's primary market for fish and seafood, with exports to the U.S. totaling $4.3 billion in 2017. In 2016, the U.S. published new *Marine Mammal Protection Act (MMPA)* import provisions pertaining to the reduction of marine mammal bycatch in foreign commercial fishing operations.

Every four years, the U.S. publishes information on all fisheries that export to the US in the List of Foreign Fisheries. A harvesting nation intending to export fish and fish products to the US after January 1, 2022, must apply to the US National Oceanic and Atmospheric Administration (NOAA) for a comparability finding for each of its commercial fisheries listed in the List of Foreign Fisheries.

For a harvesting nation to receive a comparability finding for a fishery, the U.S. MMPA import provisions mandate that the harvesting nation demonstrate:

1) prohibition of intentional mortality or serious injury of marine mammals in the course of commercial fishing operations; and
2) implementation of a regulatory program comparable in effectiveness to the U.S., including bycatch estimates from at-sea observer programs and management/mitigation measures.

Fisheries are classified by the U.S., based on their frequency of marine mammal bycatch, as either "exempt" or "export" fisheries. Exempt fisheries are fisheries that have no known or a remote likelihood of marine mammal bycatch and are exempt from instituting a regulatory program. Export fisheries are those fisheries with more than a remote likelihood of marine mammal bycatch or insufficient information available on marine mammal interactions.

DFO is working closely with the commercial wild-capture fishing industry and other stakeholders to facilitate the process under these new regulatory requirements in the U.S. This includes development profiles for each fishery that export to the U.S., and information related to current marine mammal monitoring programs, reporting requirements, and measures to mitigate the risk of marine mammal bycatch.

OBJECTIVE 5
Sustain

Management Actions & Programs

Often fatal to fish, marine mammals and other marine life, ghost gear is a navigation hazard that also breaks down into micro-plastics — one of our oceans' biggest threats.

Ghost Gear

Ghost gear refers to any fishing equipment or fishing-related litter that has been abandoned, lost or otherwise discarded, and is some of the most harmful and deadly debris found in oceans.

Fish harvesters are showing sustained commitment to protecting our oceans and reducing fishing gear interactions with marine mammals. Harvesters and their respective organizations are key partners in mitigating and retrieving ghost gear, reporting interactions between marine mammals and fishing gear (required under section 39 of the *Marine Mammal Regulations – see page 39 for more information)*, and taking steps to protect whales through gear innovation.

In February 2020, DFO hosted an international Gear Innovation Summit to further explore innovation in gear, and opportunities to minimize entanglements. In 2021, DFO worked on industry-led pilot projects in eastern Canada to test the application of new gear technologies such as ropeless gear. Initiatives such as these could help further reduce the amount of rope in the water and subsequently lower the risk of entanglements to whales in the future.

Canada recognizes the threat that ghost gear poses in our waters and around the world, and we have identified the issue as one of national importance. We are committed to taking concrete actions to support ghost gear prevention, retrieval and responsible disposal by collaborating with many groups, including Indigenous groups, fishers, environmental non-governmental organizations and coastal communities. Nationally, since 2020, $26.7 million in funding was distributed to support 91 projects.

DFO has also established a $16.3 million Sustainable Fisheries Solutions and Retrieval Support Contribution Program Ghost Gear Fund. With the help of Indigenous groups, fish harvesters, the aquaculture industry, non-profit organizations and communities this Program is taking concrete actions to support ghost gear prevention, retrieval and responsible disposal. It will also support fish harvesters in acquiring new gear technologies to reduce gear loss.

In several jurisdictions, DFO is working with industry to undertake ghost gear removal initiatives. In 2020, it became a mandatory license condition for all commercial fisheries to report lost or retrieved fishing gear.

Link for more information

Online reporting forms for ghost gear

Working Together to Collect and Recycle Ghost Gear

In 2020, a new recycling depot specifically designed for ocean plastics, including end-of-life fishing gear was built in Ucluelet, B.C. Now operational, this depot is turning plastics from ghost gear into pellets that will be used in the manufacturing of secondary plastic products, including kayaks. Recycling opportunities for fishing gear are also being developed in Powell River, B.C, and in Nootka Sound, Fisheries and Oceans Canada has partnered with the Coastal Restoration Society and local First Nations to remove abandoned shellfish aquaculture sites across Vancouver Island.

Youtube link for more information: Nootka Sound Ghost Gear Cleanup Project

OBJECTIVE 5
Sustain | Management Actions & Programs

Through a Sustainable Whale Watching Agreement with the BC Minister of Transportation and Infrastructure, companies must not intentionally offer or promote excursions based on viewing of Southern Resident killer whales.

Marine Mammal Viewing and Whale Watching

Marine mammal viewing and whale watching are enjoyed recreationally and are important ecotourism pursuits in Pacific region, and can help educate members of the public on the importance of marine mammals. The viewing of all marine mammals is subject to the provisions of the *Marine Mammal Regulations* under the *Fisheries Act*.

Regulations require that any whale watching or marine mammal viewing activities avoid the disturbance of marine mammals and that marine vessels maintain the following minimum approach distances to protect these animals from human disturbances:

- A 100 metre (m) minimum approach distance from whales, porpoises and dolphins, or 200 m if they are in resting position or with a calf, in all Canadian waters.
- A minimum approach distance of 200 m for all killer whales in Canadian fisheries waters in the Pacific Ocean.
- A minimum approach distance of 400m for all killer whales when in Southern BC coastal waters as per the Interim Order enacted under the *Canada Shipping Act*. This approach distance applies to all vessels, and is reviewed annually under the Interim Order provision.

Within the Interim Order provisions, there is an exception for authorized commercial whale-watching and ecotourism companies.

The Minister may issue an authorization for a commercial whale-watching company to view a non-resident killer whale at a distance of between 200 m and 400 m, in the areas where the Interim Order applies. This authorization is through the *Sustainable Whale Watching Agreement* in which companies must enter an Agreement with the Minister of Transport that commits them to not intentionally offer or promote excursions based on viewing of Southern Resident killer whales.

If a company is in violation of any parameters set out in the Sustainable Whale Watching Agreement, they may be subject to an Administrative Monetary Penalty, and/or possible revocation or suspension of their authorization.

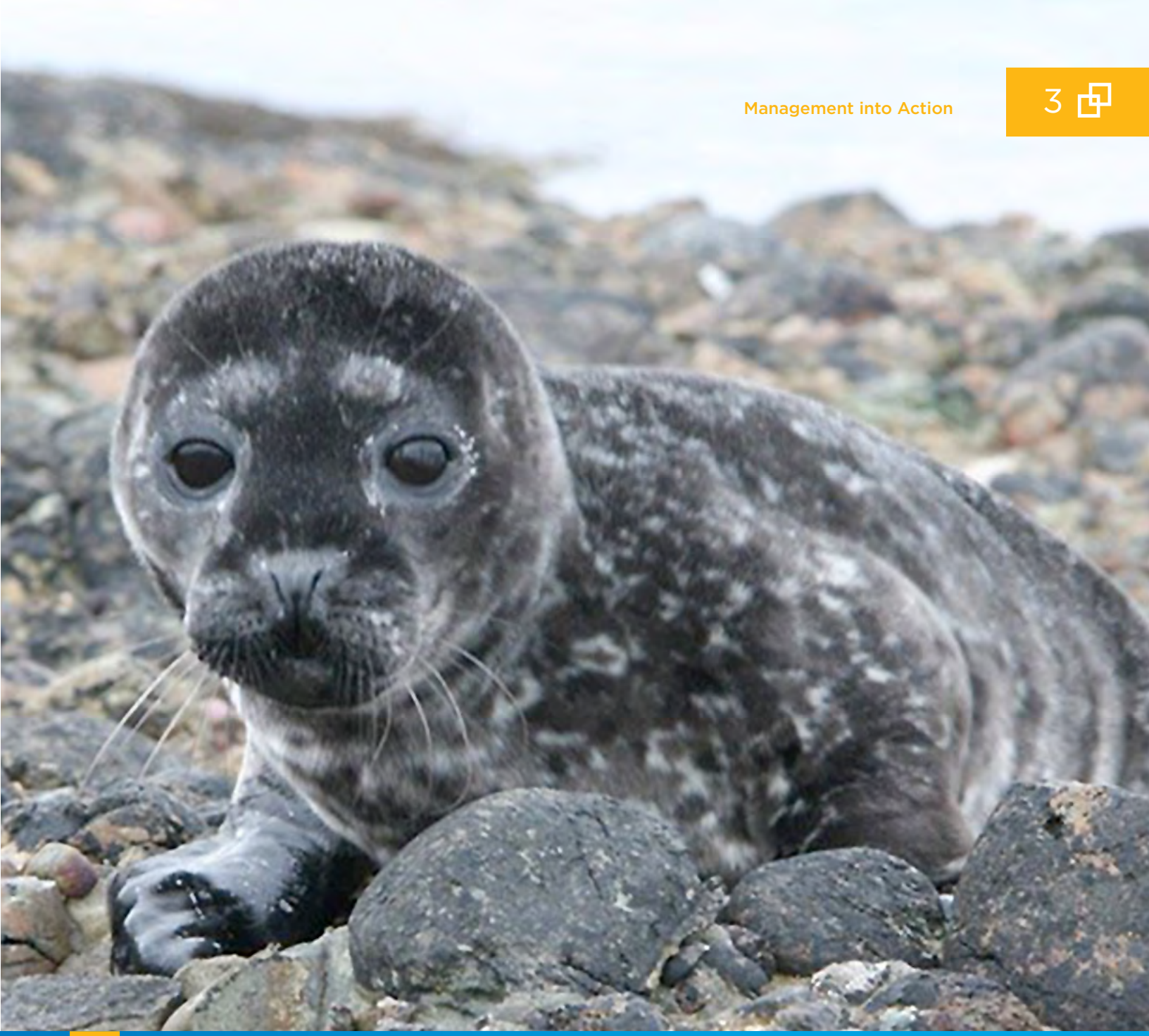
A number of voluntary actions can be taken by all marine vessel operators, paddlers and viewers to Be Whale Wise and reduce disturbance to all marine mammals including:

- Slowing down to 7 knots or less when within 1000 m of the nearest marine mammal.
- Turning off echo sounders and fish finders when not in use and in the presence of marine mammals
- Placing engine to neutral idle and allow animals to pass if your vessel is not in compliance with the approach distance regulations.
- Limiting viewing time to 30 minutes or less.
- Checking nautical charts for locations of various protected areas and no go zones.

Watching and Protecting Whales in Our Waters

Watching whales and other marine mammals in their natural surroundings gives Canadians an opportunity to better appreciate these beautiful animals, but when humans get too close to wildlife in their habitat, we risk disturbing and even harming marine wildlife. Canada's laws and regulations, as well as best practices, help to ensure our whales and marine mammals can still be enjoyed, but at a safe distance.

Link for more information: Watching and observing marine mammals



Concluding Message: Translating Objectives into Action Over Time

The conservation and protection of marine mammals and the support of sustainable marine activities is a shared responsibility by all in this region. Marine mammal management is an ongoing process to ensure the objectives of this framework are upheld conserving marine mammals for current and future generations.

4

APPENDICES

Additional Resources and Tools

The resources and tools provided throughout this integrative framework are intended to guide an adaptive management process within the context of the five action-focused management objectives outlined. While this is a DFO-led initiative for British Columbia, this work is, and will continue to be made possible through collaborative efforts with other government agencies, Indigenous groups, stakeholders and coastal communities.

Appendix I: Marine Mammal Species in British Columbia

ORDER: CETACEA

Cetaceans: Whales, Dolphins and Porpoises

Baleen Whales (Mysticetes) are some of the largest animals on earth. Characteristic baleen plates and paired blowholes help distinguish baleen whales from toothed whales. Baleen whales were named for the long plates of baleen which hang in a row (like the teeth of a comb) from their upper jaws. Baleen plates are strong and flexible; they are made of a protein similar to human fingernails. Baleen plates are broad at the base (gum line) and taper into a fringe which forms a curtain or mat inside the whale's mouth.

Baleen whales strain huge volumes of ocean water through their baleen plates to capture food and consume tonnes of krill, other zooplankton, crustaceans, and small fish.[5] Recovery planning documents (i.e. *Recovery Strategies, Action Plans, and Management Plans*) for Pacific region species listed under *Schedule 1 of the SARA* can be found at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html.

TABLE 1: Baleen Whales *Comprehensive List of Species Identified in Canadian Pacific Waters*

Species	Identification (Images Not to Scale)	Population / Designatable Unit (DU)	SARA Status as of Date Listed Under Schedule 1	COSEWIC Status as of Last Assessment
Blue Whale		**Pacific Population**	**Endangered Listed: 2005**	**Endangered Assessed: 2012**
North Pacific Right Whale		**North Pacific Population**	**Endangered Listed: 2006**	**Endangered Assessed: 2015**
Fin Whale		**Pacific Population**	**Threatened Listed: 2006**	**Special Concern Assessed: 2019**
Sei Whale		**Pacific Population**	**Endangered Listed: 2005**	**Endangered Assessed: 2013**
Grey Whale		**Eastern North Pacific Population** *Note: After it was split into two Designatable Units (DUs)[6], the structure of this population was re-assessed by COSEWIC in 2017, with the addition of a third DU for the Western Pacific population, previously unknown to occur in Canadian Pacific waters.*	**Special Concern Listed: 2005**	**Non-active Assessed: 2017**
		Northern Pacific Migratory Population	**Not Listed**	**Not at Risk Assessed: 2017**
		Pacific Coast Feeding Group Population	**Under Consideration for Listing**	**Endangered Assessed: 2017**
		Western Pacific Population	**Under Consideration for Listing**	**Endangered Assessed: 2017**
Humpback Whale		**North Pacific Population**	**Special Concern Listed: 2017**	**Special Concern Assessed: 2022**
Common Minke Whale (North Pacific Subspecies)		**Pacific Population**	**Not Listed**	**Not at Risk Assessed: 2006**

5 https://www.dfo-mpo.gc.ca/species-especes/mammals-mammiferes/cetacean-cetaces/info/index-eng.html
6 https://cosewic.ca/index.php/en/reports/preparing-status-reports/guidelines-recognizing-designatable-units

Appendix I: Marine Mammal Species in British Columbia

ORDER: CETACEA

Cetaceans: Whales, Dolphins and Porpoises

Toothed Whales (Odontocetes) Nearly 90% of cetacean species are toothed whales. Most toothed whales are small dolphins and porpoises; however, there are a few large toothed whales, including the sperm whale which grows to 18.3 meters (60 feet) in length. The presence of teeth and one external blowhole distinguishes toothed whales from baleen whales. Also, toothed whales use echolocation (i.e. biosonar) to locate food, navigate, and "see" their environment.

TABLE 2: Toothed Whales *Comprehensive List of Species Identified in Canadian Pacific Waters*

Species	Identification *(Images Not to Scale)*	Population / Designatable Unit (DU)	SARA Status as of Date Listed Under Schedule 1	COSEWIC Status as of Last Assessment
Sperm Whale		Pacific Population	Not Listed	Not at Risk Assessed: 1996
Short Finned Pilot Whale		Pacific Population	Not Listed	Not at Risk Assessed: 1993
Baird's Beaked Whale		Pacific Population	Not Listed	Not at Risk Assessed: 1992
Cuvier's Beaked Whale		Pacific Population	Not Listed	Not at Risk Assessed: 1990
Hubb's Beaked Whale		Pacific Population	Not Listed	Not at Risk Assessed: 1989
Stejneger's Beaked Whale		Pacific Population	Not Listed	Not at Risk Assessed: 1989
Pacific White Sided Dolphin		Pacific Population	Not Listed	Not at Risk Assessed: 1990
Risso's Dolphin		Pacific Population	Not Listed	Not at Risk Assessed: 1990

Appendix I: Marine Mammal Species in British Columbia

TABLE 2: Toothed Whales *Comprehensive List of Species Identified in Canadian Pacific Waters*

Species	Identification *(Images Not to Scale)*	Population /Designatable Unit (DU)	SARA Status as of Date Listed Under Schedule 1	COSEWIC Status as of Last Assessment
Killer Whale		Offshore Northeast Pacific Population	Threatened Listed: 2003	Threatened Assessed: 2008
		Northern Resident: Northeast Pacific Population	Threatened Listed: 2003	Threatened Assessed: 2008
		Southern Resident: Northeast Pacific Population	Endangered Listed: 2003	Endangered Assessed: 2008
		Transient: Northeast Pacific Population	Threatened Listed: 2003	Threatened Assessed: 2008
False Killer Whale		Pacific Population	Not Listed	Not at Risk Assessed: 1990
Harbour Porpoise		Pacific Population	Special Concern Listed: 2005	Special Concern Assessed: 2016
Northern Right Whale Dolphin		Pacific Population	Not Listed	Not at Risk Assessed: 1990
Dall's Porpoise		Pacific Population	Not Listed	Not at Risk Assessed: 1989
Pygmy Sperm Whale		Pacific Population	Not Listed	Not at Risk Assessed: 1994
Dwarf Sperm Whale		Pacific Population	Not Listed	Data Deficient Assessed: 1997
Long-beaked (Bottlenose) Common Dolphin		Pacific Population	Not Listed	Not at Risk Assessed: 1993
Short-beaked Common Dolphin		Pacific Population	Not Listed	Not at Risk Assessed: 1991
Striped Dolphin		Pacific Population	Not Listed	Not at Risk Assessed: 1993

Appendix I: Marine Mammal Species in British Columbia

ORDER: CARNIVORA

Pinnipeds (Seals and Sea Lions)

The word pinniped means fin or flipper-footed and refers to the seals, sea lions, and walruses. These animals live in the ocean but must come on land for some life processes (e.g. breeding). There are three families of pinnipeds: phocids (true seals, including elephant seals), otariids (eared seals and sea lions) and odobenids (walruses) (The Marine Mammal Center, n.d.).

TABLE 3: Pinnipeds *Comprehensive List of Species Identified in Canadian Pacific Waters*

Species	Identification *(Images Not to Scale)*	Population /Designatable Unit (DU)	SARA Status as of Date Listed Under Schedule 1	COSEWIC Status as of Last Assessment
Steller Sea Lion		Eastern Pacific Population	Special Concern Listed: 2005	Special Concern Assessed: 2013
California Sea Lion		Pacific Population	Not Listed	Not at Risk Assessed: 1987
Harbour Seal		Pacific Population	Not Listed	Not at Risk Assessed: 1999
Northern Elephant Seal		Pacific Population	Not Listed	Not at Risk Assessed: 1986
Northern Fur Seal		Pacific Population	Not Listed	Threatened Assessed: 2022

Appendix I: Marine Mammal Species in British Columbia

ORDER: CARNIVORA

Mustelids (Sea Otters)

The sea otter is the most aquatic member of the Mustelidae (weasel family), and seldom haul out, particularly in areas with human habitation. The sea otter's body is entirely covered with thick fur except for the eyes, nose, inside of the small earflaps and pads of the feet, and large groups will assemble in a formation known as a raft. Following extirpation from commercial hunting in the 19th and 20th centuries, sea otters were reintroduced to BC in the late nineteen sixties/early seventies. Eighty-nine animals were captured off Amchitka Island and in Prince William Sound, Alaska and trans-located to Checleset Bay on the west coast of Vancouver Island on three occasions: 29 otters in 1969, 14 in 1970, and 46 in 1972. Since then, there has been a remarkable growth in the population, which stood at about 8,000 otters in 2017.

TABLE 4: Mustelids *Identified in Canadian Pacific Waters*

Species	Identification *(Images Not to Scale)*	Population /Designatable Unit (DU)	SARA Status as of Date Listed Under Schedule 1	COSEWIC Status as of Last Assessment
Sea Otter		Pacific Population	Special Concern Listed: 2003	Special Concern Assessed: 2022

Appendix 2: References

Burnham RE, Vagle S, O'Neill C and Trounce K (2021). The Efficacy of Management Measures to Reduce Vessel Noise in Critical Habitat of Southern Resident Killer Whales in the Salish Sea. Front. Mar. Sci. 8:664691. doi: 10.3389/fmars.2021.664691

Fisheries and Oceans Canada. (2009, March 23). A fishery decision-making framework incorporating the precautionary approach. Retrieved from Government of Canada: https://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/precaution-eng.htm

Ford, J. K. (2014). Royal BC Museum Handbook: Marine Mammals of British Columbia (Vol. 6). Victoria: Royal BC Museum.

Gregr, E. J., Calambokidis, L., Convey, L., Ford, J. K., Perry, R. I., Spaven, L., & Zacharias, M. (2005). Proposed Recovery Strategy for Blue, Fin, and Sei Whales (Balaenoptera musculus, B. physalus, B. borealis) in Pacific Canadian waters. Nanaimo: Fisheries and Oceans Canada. NOAA. (n.d.). Whales. Retrieved from https://publications.gc.ca/site/eng/293869/publication.html

The Marine Mammal Center. (n.d.). Pinnipeds: Seals, Sea Lions and Walruses. Retrieved from The Marine Mammal Center: https://www.marinemammalcenter.org/animal-care/learn-about-marine-mammals/pinnipeds

Laist et al. (2001). Collisions between ships and whales. Marine Mammal Science 17(1):35-75

Jarvela Rosenberger, A.L., MacDuffee, M., Rosenberger, A.G.J. et al. Oil Spills and Marine Mammals in British Columbia, Canada: Development and Application of a Risk-Based Conceptual Framework. Arch Environ Contam Toxicol 73, 131–153 (2017). https://doi.org/10.1007/s00244-017-0408-7

Appendix 3: Glossary of Acronyms

ACRONYM	PHRASE
ACFLR	Aboriginal Communal Fishing License Regulations
AIS	Automatic Identification Systems
ARP	Area Response Plans
ATK	Aboriginal Traditional Knowledge
C&P	Conservation and Protection
CCAC	Canadian Council on Animal Care
CCG	Canadian Coast Guard
CESCC	Canadian Endangered Species Conservation Council
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMP	Chemicals Management Plan
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CRP	Cetacean Research Program
CSAS	Canadian Science Advisory Secretariat
CWS	Canadian Wildlife Service
DFO	Fisheries and Oceans Canada
DND	Department of National Defense
DTAG	Digital Acoustic Tag
DU	Designatable Units
ECCC	Environment and Climate Change Canada
ECHO	Enhancing Cetacean Habitat and Observation Program
EEZ	Exclusive Economic Zone
EIC	Environmental Incident Coordinators
ENGO	Environmental Non-Governmental Organization
EQG	Environmental Quality Guidelines
FFHPP	Fish and Fish Habitat Protection Program
FSC	Food Social and Ceremonial
HAB	Harmful Algal Blooms
IK	Indigenous Knowledge
IKS	Indigenous Knowledge Systems
IWC	International Whaling Commission
LOFF	List of Foreign Fisheries

Appendix 3: Glossary of Acronyms

ACRONYM	PHRASE
MEQ	Marine Environmental Quality
MMPA	Marine Mammal Protection Act
MPA	Marine Protected Area
MSC	Marine Stewardship Council
MSP	Marine Spatial Planning
NACOSAR	National Aboriginal Council on Species at Risk
NEEC	National Environmental Emergencies Centre
NOAA	National Oceanic and Atmospheric Administration
PAWPIT	Pollutants Affecting Whales and their Prey Inventory Tool
PBR	Potential Biological Removal
PCA	Parks Canada Agency
PIER	Planning for Integrated Environmental Response
POP	Persistent Organic Pollutants
PRISMM	Pacific Region International Survey of Megafauna
RIRSD	Recognition of Indigenous Rights and Self-Determination
SARA	Species at Risk Act
SRKW	Southern Resident killer whale
TEK	Traditional Ecological Knowledge
UNCBD	The UN Convention on Biological Diversity
UNCLOS	The 1982 United Nations Convention on the Law of the Sea
WRAS	Whale Report Alert System
WTN	Whale Tracking Network

THIS INTEGRATIVE MANAGEMENT FRAMEWORK WAS DESIGNED FOR DFO PACIFIC REGION BY VISUAL THINKERS COMMUNICATION DESIGN INC.

Fisheries and Oceans Canada

Pêches et Océans Canada

Canada