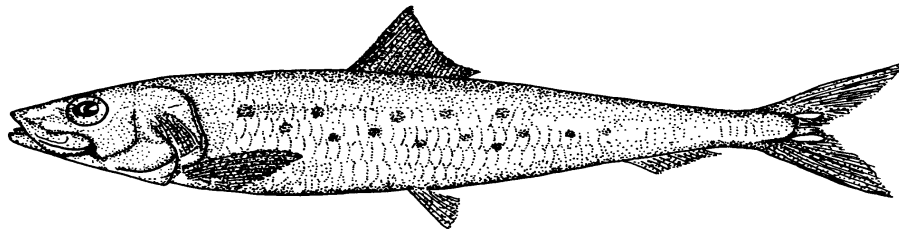


PACIFIC REGION
INTEGRATED FISHERIES
MANAGEMENT PLAN
PACIFIC SARDINE

JUNE 1, 2015 TO
FEBRUARY 9, 2018



Sardine (Sardinops Sagax)



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Canada

This Integrated Fisheries Management Plan is intended for general purposes only. Where there is a discrepancy between the Plan and the regulations, the regulations are the final authority. A description of Areas and Subareas referenced in this Plan can be found in the Pacific Fishery Management Area Regulations.

FOREWORD

The purpose of this Integrated Fisheries Management Plan (IFMP) is to identify the main objectives and requirements for the sardine fishery in the Pacific Region as well as the management measures that will be used to achieve these objectives. This document also serves to communicate the basic information on the fishery and its management to DFO staff, legislated co-management boards and other stakeholders. This IFMP provides a common understanding of the basic “rules” for the sustainable management of the fisheries resource.

This IFMP is not a legally binding instrument which can form the basis of a legal challenge. The IFMP can be modified at any time and does 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 IFMP in accordance with the powers granted pursuant to the Fisheries Act.

Where DFO is responsible for implementing obligations under land claims agreements, the IFMP will be implemented in a manner consistent with these obligations. In the event that an IFMP is inconsistent with obligations under land claims agreements, the provisions of the land claims agreements will prevail to the extent of the inconsistency.

RECORD OF AMENDMENTS

Amendment Date:	Sections Amended:
June 1, 2015	Original version published
June 26	Amendments to Appendix 5

TABLE OF CONTENTS

1.	OVERVIEW.....	7
1.1.	INTRODUCTION.....	7
1.2.	HISTORY.....	7
1.3.	TYPE OF FISHERY AND PARTICIPANTS.....	7
1.3.1.	COMMERCIAL.....	7
1.3.2.	FIRST NATIONS.....	8
1.3.3.	RECREATIONAL.....	8
1.4.	LOCATION AND TIMING OF FISHERIES.....	8
1.4.1.	COMMERCIAL.....	8
1.4.2.	FIRST NATIONS.....	8
1.4.3.	RECREATIONAL.....	9
1.5.	FISHERY CHARACTERISTICS.....	9
1.5.1.	COMMERCIAL LICENCE ELIGIBILITY.....	9
1.5.2.	MULTIPLE DESIGNATIONS OF LICENCES.....	9
1.5.3.	SHARING OF HARVEST.....	10
1.6.	GOVERNANCE.....	10
1.6.1.	NATIONAL.....	10
1.7.	CONSULTATION.....	11
1.8.	APPROVAL PROCESS.....	12
2.	STOCK ASSESSMENT, SCIENCE AND TRADITIONAL KNOWLEDGE.....	12
2.1.	BIOLOGICAL SYNOPSIS.....	12
2.2.	ECOSYSTEM INTERACTIONS.....	13
2.3.	ABORIGINAL TRADITIONAL KNOWLEDGE/TRADITIONAL ECOLOGICAL KNOWLEDGE.....	13
2.4.	STOCK ASSESSMENT AND DATA SOURCES.....	13
2.5.	PRECAUTIONARY APPROACH.....	14
2.6.	RESEARCH.....	15
3.	SOCIAL, CULTURAL AND ECONOMIC IMPORTANCE.....	16
3.1.	FIRST NATIONS.....	16
3.2.	RECREATIONAL.....	16
3.3.	COMMERCIAL.....	16
4.	MANAGEMENT ISSUES.....	17
4.1.	LONG TERM MANAGEMENT OF SARDINE FISHERY.....	18
4.2.	CATCH MONITORING.....	18
4.2.1.	BYCATCH.....	18
4.2.2.	MANAGEMENT OF DISCARDS.....	19
4.3.	GEAR IMPACTS.....	19
4.4.	COMMUNAL COMMERCIAL LICENCE DISTRIBUTION.....	19
4.5.	DEPLETED SPECIES CONCERNS.....	20
4.5.1.	COMMITTEE ON THE STATUS OF ENDANGERED WILDLIFE SPECIES ASSESSMENTS (COSEWIC).....	20
4.5.2.	SPECIES AT RISK ACT (SARA).....	20

4.6.	OCEANS AND HABITAT CONSIDERATIONS.....	23
4.6.1.	OCEANS ACT	23
4.6.2.	PACIFIC NORTH COAST INTEGRATED MANAGEMENT AREA	23
4.6.3.	MARINE PROTECTED AREA NETWORKS	24
4.6.4.	MARINE PROTECTED AREAS	24
4.6.5.	NATIONAL MARINE CONSERVATION AREAS	25
4.6.6.	MARINE NATIONAL WILDLIFE AREAS	26
4.7.	INTERNATIONAL CONSIDERATIONS	26
5.	OBJECTIVES	27
5.1.	NATIONAL	27
5.2.	PACIFIC REGION.....	27
5.3.	PACIFIC SARDINE RESOURCE MANAGEMENT	28
5.3.1.	STOCK CONSERVATION	28
5.3.2.	ECOSYSTEM PROCESSES.....	28
5.3.3.	CONSULTATION	28
5.3.4.	SOCIAL, CULTURAL, AND ECONOMIC CONSIDERATIONS	28
5.3.5.	COMPLIANCE OBJECTIVES.....	28
6.	ACCESS AND ALLOCATION.....	28
6.1.	QUOTAS AND ALLOCATIONS	29
6.1.1.	FIRST NATIONS.....	29
6.1.2.	RECREATIONAL.....	29
6.1.3.	COMMERCIAL	29
7.	MANAGEMENT MEASURES FOR THE DURATION OF THE PLAN	30
8.	SHARED STEWARDSHIP ARRANGEMENTS	30
9.	COMPLIANCE PLAN.....	31
9.1.	REGIONAL COMPLIANCE PROGRAM DELIVERY	32
9.2.	AERIAL SURVEILLANCE	32
9.3.	COMPLIANCE PERFORMANCE.....	32
10.	PERFORMANCE / EVALUATION CRITERIA	32
10.1.	NATIONAL	32
10.2.	PACIFIC REGION.....	32
10.3.	PACIFIC SARDINE RESOURCE MANAGEMENT	33
10.3.1.	STOCK CONSERVATION AND ECOSYSTEM PROCESSES.....	33
10.3.2.	CONSULTATION	33
10.3.3.	SOCIAL, CULTURAL AND ECONOMIC CONSIDERATIONS	33
10.3.4.	COMPLIANCE	34
11.	REFERENCES.....	34
12.	GLOSSARY	35

APPENDIX 1. POST-SEASON REVIEW

APPENDIX 2. STOCK ASSESSMENT RESULTS

APPENDIX 3. ABORIGINAL FISHING PLAN

APPENDIX 4. RECREATIONAL FISHING PLAN

APPENDIX 5. COMMERCIAL FISHING PLAN

APPENDIX 6. CONTACTS

APPENDIX 7. FISHING VESSEL SAFETY

APPENDIX 8. SAMPLE LOGBOOK PAGE

APPENDIX 9. SARDINE INTEGRATED ADVISORY BOARD REPRESENTATIVES

APPENDIX 10. SARDINE FISHERY CLOSURES FOR AREAS 23 – 27

APPENDIX 11. SALMON BYCATCH AND DISCARD MANAGEMENT FRAMEWORK

1. OVERVIEW

1.1. Introduction

The 2015-2018 Pacific Sardine Integrated Fisheries Management Plan (IFMP) is valid for the period of June 1, 2015 to February 9, 2018 for the Pacific Sardine fishery in tidal waters of the Pacific Ocean on the west coast of Vancouver Island (WCVI), the central coast and the north coast. This multi-year IFMP provides for longer term planning and increases stability for the fishery participants.

1.2. History

The Pacific Sardine fishery is an opportunistic fishery dependent on the migration of sardines into Canadian waters. Sardine migration and population levels are heavily influenced by oceanic conditions that determine the survival and recruitment of juveniles into the adult stock. A sardine fishery in B.C. is dependent on favourable ocean conditions which support the growth and production of the Pacific Sardine stock.

From 1996 to 2001, there was a limited experimental harvest of Pacific Sardine by a small number of harvesters. Given the results of the experimental fishing, and the de-listing of Pacific Sardine by the Federal-Provincial Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as a species of “special concern” in May 2002, the seine component of the fishery moved to a commercial phase in 2002 consistent with the Department’s New Emerging Fisheries policy (NEFP). A one-year interim plan was developed in 2002 using a precautionary approach while providing opportunity for continued assessment of the viability of the fishery and the potential for future expansion. An experimental/exploratory phase was initiated to investigate the feasibility of alternative gear types and areas. From 2003 to 2006, the Department developed a three year fishing plan that allowed for an incremental approach towards development of the fishery while continuing to follow the principles of the NEFP. From 2007 to 2011, the Department developed an annual Integrated Fisheries Management Plan to support growth of the fishery. A three-year management plan was developed for the period of 2012 to 2015, and this plan will be for another three-year period, covering 2015 to 2018.

1.3. Type of Fishery and Participants

1.3.1. Commercial

There are a total of 50 licences for the Pacific Sardine fishery (25 commercial and 25 communal commercial licences). All commercial harvest of Pacific Sardine is currently made using purse seine gear. In recent years only 13 to 20 vessels have been active in any one year. Vessels are generally 60 – 70 feet in length with 4 - 5 crew members. The fishery is open from June 1 to February 9 each year and is managed by individual licence quotas. The majority of the harvest occurs from August to October.

1.3.2. First Nations

In the 1990 *Sparrow decision*, the Supreme Court of Canada found that where an Aboriginal group has an Aboriginal right to fish for food, social and ceremonial (FSC) purposes, it takes priority, after conservation, over other uses of the resource. Fisheries are authorized via a Communal Licence issued by the Department under the *Aboriginal Communal Fishing Licences Regulations*. There is no known FSC fishing for Pacific Sardine in the Pacific Region at this time. Communal licences should be differentiated from First Nations communal commercial licences, which are allocated 50% of the commercial TAC.

In addition to fishing opportunities for FSC purposes (or domestic purposes for treaty bands), DFO acknowledges that in *Ahousaht Indian Band et al. v. Canada and British Columbia*, the courts have found that five Nuu-chah-nulth First Nations located on the west coast of Vancouver Island – Ahousaht, Ehattesaht, Hesquiaht, Mowachaht/Muchalaht, and Tla-o-qui-aht – have what the courts have characterized as “aboriginal rights to fish for any species of fish within their Fishing Territories and to sell that fish, with the exception of geoduck”.

The Department is working with the First Nations pursuant to the rights found by the courts, to find “the manner in which the plaintiffs’ rights can be accommodated and exercised without jeopardizing Canada’s legislative objectives and societal interests in regulating the fishery.” The outcome of these discussions could lead to in-season management changes. DFO will make every effort to advise stakeholders of any such changes in advance of them being implemented.

1.3.3. Recreational

A recreational fishery is permitted to occur annually coastwide. A B.C. Tidal Waters Sport Fishing Licence is required for the recreational harvest of all species of fish in tidal waters. Tidal Waters Sport Fishing Licences are primarily available only online at:

<http://www.pac.dfo-mpo.gc.ca/fm-gp/licence-permis/index-eng.htm>.

Many anglers harvest sardine both for food and bait in the Pacific Region, although catch and effort levels are unknown for the recreational sardine fishery. For more information about recreational fishing for Pacific Sardine, please visit:

<http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/points/finfish-peche-eng.html>

1.4. Location and Timing of Fisheries

1.4.1. Commercial

With the exception of permanent and seasonal closures (outlined in Appendix 5), the Pacific Sardine fishery will be open from June 1 to February 9 each year, in Pacific Fishery Management Areas (PFMAs) 3 – 13, 20, 23 to 27, 101 to 110, 121, 123 to 127, 130 and 142.

1.4.2. First Nations

Aboriginal harvest may occur annually coastwide, where appropriately licensed. There have been no food, social or ceremonial (FSC) sardine licences issued to First Nations to date.

1.4.3. Recreational

Recreational harvest of sardine may occur coast wide with a BC Tidal Waters Sport Fishing licence.

1.5. Fishery Characteristics

1.5.1. Commercial Licence Eligibility

Due to the commercial participants' desire for stability and certainty, Fisheries Management moved forward in 2007 with a consultative process to develop an on-going licence eligibility list for 25 commercial sardine licences.

Extensive consultations were undertaken through meetings with the Department's Sardine Integrated Advisory Board (SIAB) and a public workshop was also held to develop criteria for screening and ranking applicants for an on-going licence eligibility list. The Department invited all parties that had expressed an interest in the sardine fishery since its inception in 1997, as well as coastal First Nations to the public workshop.

Based on these consultations, the Department utilized a point system to determine the on-going licence eligibilities and ranking, using control dates of 1997 to 2006, based on the following criteria:

- (50%) Number of years licenced
- (25%) Landings (points per year for minimum landings of 5 metric tonnes shared between the licence holder and vessel owner)
- (25%) Effort (points per year for effort determined by hail records to the service provider shared between the licence holder and the vessel owner)

DFO then underwent a review, verification and independent appeals process. In 2009, the 25 commercial participants on the final eligibility list were confirmed.

1.5.2. Multiple Designations of Licences

In 2007, a two year pilot program to allow multiple designations of commercial and communal commercial Pacific Sardine licences was initiated. This permitted a maximum of five unfished sardine licences to be designated to one vessel at the same time.

During the 2008 and 2009 post-season reviews, the pilot was evaluated based on the following criteria:

- Fish harvesters' ability to make allocation changes to their licence within 1 business day;
- Ability of the service provider to accurately match catch to licences;
- No related enforcement issues; and
- No increased cost to the Department.

Based on the successful review through the post-season advisory process, designations of multiple licences to a vessel (“stacking”) was adopted by the Department as an ongoing component of the sardine fishery.

1.5.3. Sharing of Harvest

To minimize discards and reduce mortality of Pacific Sardine, licensed vessels have been permitted to share individual sets of harvest since 2007. A vessel that has commenced fishing may remove fish from the seine gear of another vessel engaged in fishing. All vessels that receive portions of a set must record this fishing activity in the sardine harvest logbook, including location and vessel the fish came from, with the receiving vessel responsible for transporting the fish to land for validation.

1.6. Governance

1.6.1. National

- The *Fisheries Act* and the regulations made thereunder;
 - Areas and Subareas, as described in the *Pacific Fishery Management Area Regulations*, are referenced in describing sardine Management Areas.
 - *Fishery (General) Regulations* (i.e. Conditions of Licence) and the *Pacific Fishery Regulations, 1993* (i.e. open times).
 - The *British Columbia Sport Fishing Regulations* (1996).
 - The *Aboriginal Communal Fishing Licences Regulations* (1993).
- The *Oceans Act*;
- The *Species at Risk Act*.

These documents are available at:

<http://www.dfo-mpo.gc.ca/acts-loi-eng.htm>

DFO regularly works with fishery participants, Aboriginal groups and Provinces and Territories in reviewing and renewing its policy frameworks in support of a sustainable and economically viable fishery. These initiatives are designed to support DFO’s vision of a credible, science-based, affordable and effective fisheries program, which contributes to the sustainable wealth of Canadians.

Current Fisheries Renewal projects include:

- the expansion of efforts to manage fisheries using multi-year science advice and multi-year management plans incorporating harvest levels and other primary management measures;
- the requirement for all fishers to cover business costs related to tags and logbooks where they are deemed an ongoing requirement (in line with the policy that those who benefit from the use of the resource be required to assist in paying for the management of the resource);
- the implementation of a suite of services to the fishing industry including online purchasing and renewal of commercial fishing licensing services, issuance of licence conditions, approval of designations and quota transfers; and,

- legislative and policy changes with regard to use of fish or fishing gear to fund joint project agreements (described further below).

On June 29, 2012, the *Jobs, Growth and Long-term Prosperity Act* (Bill C-38) received Royal Assent and became law. This Act contained provisions that amended the *Fisheries Act*. These provisions grant the Minister of Fisheries and Oceans the authority to allocate fish or fishing gear for the purpose of financing scientific and fisheries management activities that are described in a joint project agreement entered into with any person or body, or any federal or provincial minister, department, or agency. Allocations of fish for financing scientific and management activities are identified in the appropriate harvest plans appended to this plan.

In addition to the initiatives and legislation changes summarized above, the Department's Sustainable Fisheries Framework comprises the following policy instruments for adopting an ecosystem based approach to fisheries management:

- Policy on Managing Bycatch (April 2013);
- Guidance on the Policy on Managing Bycatch
- Fishery Decision-Making Framework Incorporating the Precautionary Approach (April 2009);
- Guidance for the Development of Rebuilding Plans under the Precautionary Approach Framework
- Policy for Managing Impacts of Fishing on Benthic Habitat, Communities, and Species (April 2009);
- Ecological Risk Assessment Framework (ERAF) for Coldwater Corals and Sponge Dominated Communities (April 2013); and,
- Policy on New Fisheries for Forage Species (April 2009).

Along with existing economic and shared stewardship policies, these will help the Department meet objectives for long-term sustainability, economic prosperity, and improved governance. Further information can be found at the DFO website:

<http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/index-eng.htm>

1.7. Consultation

Fisheries and Oceans Canada (DFO) has a broad mandate, with the authority to regulate and enforce activities, develop policy, provide services and manage programs. To help ensure that the Department's policies and programs are aligned with its vision and effectively address the interests and preferences of Canadians, DFO supports consultations that are transparent, accessible and accountable.

Fisheries and Oceans Canada, Pacific Region, undertakes consultations in order to improve departmental decision-making processes, promote understanding of fisheries, oceans and marine transport issues, and strengthen relationships. Policy guidance and strategic direction for public consultation activity is provided by the Consultation Secretariat in the Policy Branch.

The Sardine Integrated Advisory Board (SIAB) is the Department's primary consultative body which provides recommendations on operational and policy decisions related to the Pacific Sardine fishery. The SIAB is comprised of representatives from communal commercial and commercial licence holders, processing sector, environmental groups and the recreational sector. In addition there is active participation from a representative of the Province of BC. Government of Canada representation is coordinated by the sardine Resource Manager based on meeting agenda items. Stakeholders and other user groups are encouraged to participate in the advisory process by expressing their interests and views through their elected advisors or attending meetings as observers. Please refer to the list of SIAB representatives in Appendix 9. Please also refer to the DFO consultation website for information on SIAB meetings including meeting minutes, presentations and the SIAB Terms of Reference at:

<http://www.pac.dfo-mpo.gc.ca/consultation/pelag/siab-ccs/index-eng.html>

1.8. Approval Process

The Regional Director General, Pacific Region approves this plan. This is the second multi-year IFMP for Pacific Sardine (3 years). The plan appendices may be amended as required for the proper management and control of the Pacific Sardine fishery.

2. STOCK ASSESSMENT, SCIENCE AND TRADITIONAL KNOWLEDGE

2.1. Biological Synopsis

Sardines are schooling pelagic fish found in relatively warm waters of every ocean with a global distribution restricted from 60°N to 50°S. Scale-deposition studies have revealed hundreds and thousands of years of “boom and bust” cycles of Pacific Sardine populations off California (Baumgartner et al. 1992) and Chile (Valdes et al. 2008). The population of Pacific Sardine (*Sardinops sagax*) in the Northeast Pacific are linked to the California Current ecosystem and the population has undergone long-term fluctuations in abundance for at least 2000 years. In the last century, large abundances occurred throughout the population's range from the early 1900s to the late 1940s. This population was fished extensively from the early 1900s through the late 1940s. Following that period, their abundance declined and their distribution contracted to small pockets off southern California and Ensenada Mexico. The population gradually rebuilt in the 1980s and as the population size increased so did the northern extent of its distribution. A resurgence of sardine distribution into British Columbia (B.C.) waters was observed in the 1990s. Sardine population levels are heavily influenced by oceanic conditions that determine the survival and recruitment of juveniles into the adult stock and stock migration patterns into Canadian waters.

The main spawning grounds for the California Current sardine population are off southern California and northwest Baja, Mexico but during warm periods, such as during strong El Niño events, environmental conditions may be conducive to sardine spawning in more northern waters, such as off the Oregon, Washington and B.C. coasts. Adult sardines can spawn annually between 2 and 10 years of age and year class and recruitment success can vary greatly. A strong year class can have a large impact on the abundance

of the coastwide population for several years. Sardines aged two to four generally range from 17 to 22 cm (fork length); whereas sardines aged four to ten years generally range from 20 to 25 cm.

Sardine movements and population structure are quite dynamic and several aspects of stock structure are poorly understood. Seasonal trends in geographic distribution and biological observations (length, age, parasite and historic tagging data) show that regional connectivity in the population is complex. In general, the majority of sardines seasonally observed off B.C., Washington and Oregon are relatively large and represent older components of the population compared to sardines observed off California and Baja Mexico. Seasonal migrations are also complex, with timing and extent of movements affected by population size and structure and oceanographic factors (Ware and Thompson 1991; McFarlane et al 2002). The northward migration appears to be constrained by the 12°C isotherm (Ware 2001). Sardines filter feed on phytoplankton and zooplankton and summer migrations into B.C. waters enable them to benefit from the marine productivity resulting from extended daylight and nutrient rich waters from oceanic upwelling and coastal run-off.

2.2. Ecosystem Interactions

Pacific Sardine are a transboundary species spawning off southern California and migrating to the Pacific Northwest including B.C. during the summer to feed on abundant plankton resources. The extent of the northward migration is, in part, related to oceanographic conditions, particularly sea surface temperature, such that stocks move further north during warmer years. Sea surface temperature has also been related to juvenile survival for recruitment to the adult spawning population with stronger recruitment occurring during warmer years.

Similar to other forage fish species in B.C. waters, sardine are eaten by a variety of predators, particularly salmonids, sharks, sea lions, and humpback whales and seabirds. Their seasonal distribution in B.C. waters corresponds with salmon and humpback whale foraging and migrating seasons. Research continues to develop a better understanding of ecosystem processes, including environmental effects on sardine recruitment, and the role that sardines play in ecosystem structure and function.

2.3. Aboriginal Traditional Knowledge/Traditional Ecological Knowledge

Aboriginal Traditional Knowledge and Traditional Ecological Knowledge in the form of observations and comments collected from commercial and aboriginal harvests over many years contributed to decisions on scientific survey locations and are considered in management decisions.

2.4. Stock Assessment and Data Sources

United States scientists annually produce a stock assessment of the California Current sardine population that incorporates fishery catch data (landings and biological data) and research survey data (from acoustic-trawl, aerial, and ichthyoplankton-trawl surveys) into an age structured Stock Synthesis model which collectively represents sardine abundance from northern Baja Mexico to B.C. (Hill et al. 2012). The methods and results associated with the population assessment are formally reviewed every two to four years. Data from

Canadian sardine samples, representing length and age composition and total catch have been included in the Stock Synthesis assessment.

From 1997 to 2014, data from a summer pelagic trawl survey off the west coast of Vancouver Island were used to characterize the regional distribution, relative abundance, and biological information of sardine in B.C. waters. In 2006, the trawl survey began sampling during night hours to reduce variability in catch data and improve characterization of fish diets. Using data from trawl surveys, methods to estimate seasonal biomass and migration of sardine were developed (Schweigert and McFarland 2001; Schweigert et al 2010; Flostrand et al 2011).

B.C. catch data have been collected for all years of the commercial fishery. These data include geographic positions of fishing activities and biological data (length, weight and sex, fat content etc) from samples. Some ageing has also been done on catch samples from some years.

In general, size and age distributions of sardine caught in B.C. waters show a higher proportion of larger and older sardines compared to sardine observed from other regions of the population's range. For example, many seasons have shown that the majority of sardine samples from B.C. waters have fork lengths ranging from 21- 27 cm with ages ranging from 3 -8 years or older.

Results representing regional biomass and migration (and to some degree age and length compositions) are additional information available to fisheries management for consideration in association with Stock Synthesis population assessment biomass estimates and B.C. commercial sardine fishery catch data (fishing locations and landings) for setting annual total allowable catch levels of sardine in B.C.

2.5. Precautionary Approach

The Department implemented the Sustainable Fisheries Framework (SFF), which is a toolbox of existing and new policies for Fisheries and Oceans Canada (DFO) and other interests to sustainably manage Canadian fisheries in order to conserve fish stocks and support prosperous fisheries.

Fisheries worldwide are under increasing pressure, creating challenges for policy makers, resource managers and industry leaders to make informed decisions regarding the conservation, recovery and wise management of these precious resources. DFO held consultations throughout Canada in 2007 and 2008 to develop strategies to ease ecosystem pressures and enhance the capacity of the resource to sustain growing industry needs. New conservation policies were developed to implement a precautionary and ecosystem-based approach to fisheries management. These policies, incorporated into development of new Integrated Fisheries Management Plan (IFMP) templates, have joined existing policies in a new framework to promote sustainable fisheries.

The new fishery decision-making framework incorporating the precautionary approach policy (<http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/precaution-eng.htm>) applies to key harvested fish stocks managed by DFO, including commercial, recreational, or subsistence fisheries.

The framework requires that a harvest strategy be incorporated into respective fisheries management plans to keep the removal rate moderate when the stock status is healthy, to promote rebuilding when stock status is low, and to ensure a low risk of serious or irreversible harm to the stock. It also requires a rebuilding plan when a stock reaches low levels.

In general, the precautionary approach in fisheries management is about being cautious when scientific knowledge is uncertain, and not using the absence of adequate scientific information as a reason to postpone or fail to take action to avoid serious harm to fish stocks or their ecosystem. This approach is widely accepted as an essential part of a sustainable fisheries management.

Applying the precautionary approach to fisheries management decisions entails establishing a harvest strategy that:

- identifies three stock status zones – healthy, cautious, and critical – according to upper stock reference points and limit reference points;
- sets the removal rate at which fish may be harvested within each stock status zone; and
- adjusts the removal rate according to fish stock status variations (i.e., spawning stock biomass or another index/metric relevant to population productivity), based on pre-agreed decision rules.

2.6. Research

There is continued collaboration by DFO with the United States government's National Oceanic and Atmospheric Administration, National Marine Fisheries Service, on providing information for sardine stock assessment purposes, exchanging knowledge of ecosystem interactions, sharing fishery catch information, and discussion on approaches used for management of the Pacific Sardine fishery and industry trends.

For over a decade, extensive research programs have been underway to better understand the dynamics of the California Current sardine population. Listed below are examples of research initiatives led by U.S. and Canadian science teams. Most examples are of ongoing research and include collaborations between nations on topics such as population dynamics and habitat modeling.

Additional research is conducted by Mexican teams, although not explicitly listed in below examples.

The United States:

- Abundance indices, seasonal distribution and biological samples
 - Ichthyoplankton-trawl (and fecundity) spring surveys off California
 - Summer coastwide aerial surveys
 - Spring and summer acoustic-trawl surveys
 - Columbia River Plume pelagic trawl surveys
- Population assessment or modelling components
 - Ageing research and developing age and length relationships
 - Recruitment and year class modeling
 - Characterizing fishery selectivities

- Management strategy evaluation
- Harvest control rule parameter estimates (e.g F_{MSY} and Distribution)
- Sardine habitat modeling
 - Use of survey, fishery and oceanographic data to predict and test habitat models

Canada:

- Summer research survey (core west coast Vancouver Island region and additional coverage)
 - Trawl densities and regional distribution (relative abundance index)
 - Species associations (sardine diet, sardine predator diet, putative sardine competitors)
 - Plankton and oceanographic (water) sampling
 - Scientific acoustic records (EK60) by species groups (abundance and distribution)
 - Marine mammal daytime observations
- Ageing research and fat testing (survey and commercial sampling)
- Aerial survey feasibility trials (2009-2011)
- Regional ecosystem/trophic modeling

3. SOCIAL, CULTURAL AND ECONOMIC IMPORTANCE

3.1. First Nations

DFO continues to provide opportunities for First Nations to harvest fish for food, social, and ceremonial (FSC) purposes, in a manner consistent with the *Sparrow Decision* (SCC 1990), and other court decisions. Although there are no limits placed on aboriginal harvest of sardine for food, social and ceremonial purposes, no FSC fishery for sardine are known to exist.

3.2. Recreational

Recreational harvest of sardine may occur coast wide with a BC Tidal Waters Sport Fishing licence. The Department's resource management policies must consider access for recreational purposes however there is no known recreational harvest of sardine and the entire TAC is currently allocated for commercial harvest.

3.3. Commercial

In 2012, thirteen vessels harvested 19,172 tonnes of sardines valued at \$3.3m. However, since 2013, the commercial harvest of sardine has been zero. Since becoming a commercial fishery, there have been increases in available TAC and management changes to licence structure which have led to improved financial returns. Specifically, starting in 2008, direct economic efficiencies were created as licence holders were permitted to stack multiple licences and associated quota to the same vessel. The table below shows that the ability to increase harvest per boat led to an increase in both days fished and in the percentage of the TAC actually caught.

Table 1: Sardine fleet catch and effort 2003-2014

	TAC (MT)	Harvest (MT)	Est. Days Fished	Active Vessels
2003	9,000	1,006	74	9
2004	15,000	4,259	170	23
2005	15,200	3,266	167	16
2006	13,500	1,558	60	15
2007	19,800	1,507	52	10
2008	12,491	10,435	283	20
2009	18,196	15,334	319	17
2010	23,166	22,223	384	13
2011	21,917	20,719	343	13
2012	27,279	19,172	334	13
2013	25,477	0	0	0
2014	17,174	0	0	0

Source: DFO Sardine Catch and Effort Database

The majority of all active sardine vessels stack licences and their associated quota. Based on a 2009 Fleet financial profile of the fishery, the average boat harvested just under 3 licences with an estimated boat return of approximately \$30,000¹. Five vessels accounted for just over half of all sardine licences (communal commercial and commercial). While vessels that have been active in the sardine seine fishery are also often active in the salmon & herring fisheries, majority of their gross revenue (more than 50%) was from the harvest of sardines in 2009.

Between 2010 and 2012, the average landed value and wholesale value of B.C. sardine was \$3.66m and \$21.35, respectively². Based on this revenue, it is estimated that the 60 or so captain and crew involved in the 2012 season would have earned approximately \$1.1M. Additional income earned by processing sector workers (employed mainly in Ucluelet, Delta, and Port Hardy) would have been in the range of \$2.5-\$3M³.

A notable future challenge in the sardine fishery, should harvest resume, will be finding appropriate buyers for this product. The B.C. sardine harvest, like the much larger U.S. sardine harvest, is mostly destined as low value bait in the tuna high seas longline fishery. Past efforts to gain access to the higher value food product market had mixed results. Due to the recent political environment (i.e. Russia/Ukraine conflict and Russian embargo on Canadian products), it is expected that market concerns will continue for the B.C. sardine fishery. On average, between 2010 and 2012, 6.5% of total B.C. sardine exports went to the Russian Federation and the Ukraine; a key export market for B.C. sardines after the U.S.

4. MANAGEMENT ISSUES

¹ Pacific Commercial Fishing Fleet Financial Profile Series 2011-3

² Reported in 2013 dollars

³ DFO estimate based on industry financial model and special BC Input Output model multipliers created by BC Stats for DFO.

4.1. Long Term Management of Sardine Fishery

It is a widely known fact that sardine abundance along the west coast of North America (from northern Mexico to B.C.) is highly dependent on oceanic conditions and fluctuations in populations (aka “boom and bust cycles”) may last for several decades at a time.

When the current sardine stock enters the next decline phase of the cycle, the sardine industry has advised the Department that the existing sardine management framework (this IFMP) should be maintained throughout the length of the “down cycle”, so that a fishery may begin according to the current management measures once the sardine abundance has increased enough that harvest is permitted. Industry is concerned that development of the fishery would begin from the initial development stages again, and that the extensive amounts of time and money invested into the fishery since the start of the last sardine cycle will have been wasted.

At this time, all management measures in place for the sardine fishery (i.e. licensing, monitoring requirements, etc.) will remain in place until further notice. The Department will continue to consult with the sardine industry regarding the best way to ensure that the management structure for sardine remains in place when the stock enters the decline phase.

4.2. Catch Monitoring

4.2.1. Bycatch

There is minimal incidental catch in the sardine fishery. However, because the sardine fishery generally takes place in the same areas and during the same times as migrating salmon populations in the WCVI, there is a concern that salmon are vulnerable to interception by the sardine fleet.

From 2008 to 2011, 100% at-sea observer coverage (from July 15 – October 1) was utilized in the sardine fishery to monitor impacts of the sardine fleet on WCVI salmon stocks. In 2010 and 2011, the sardine industry requested that the level of at-sea observer coverage be reduced from 100% in order to be more practical and affordable for the fleet. In response to the request, DFO agreed to undertake an audit of logbook, dockside validation and at-sea observer report data in order to inform decisions for the future of the sardine monitoring program, and in particular to determine the appropriate level of at-sea observer coverage in Areas 23-27 (WCVI) based on DFO resource management, science and salmon stock assessment objectives.

An audit of the sardine monitoring program was conducted during the summer of 2011 and presented to SIAB later that fall. The audit results were accepted by SIAB and it was recommended that a sardine monitoring program Working Group be formed in order for DFO resource managers, DFO salmon stock assessment biologists, and SIAB representatives to cooperatively plan and adjust the monitoring program in order to create an effective, practical and adaptable program that met the objectives of both DFO and industry stakeholders.

The sardine monitoring program Working Group was formed and met for the first time in February, 2012. The working group developed the “Salmon Bycatch and Discard Management Framework” which outlines management measures to implement in the sardine fishery in order to mitigate possible impacts on migrating WCVI salmon populations. The working group meets as required to discuss and evaluate the sardine monitoring program.

The sardine monitoring program operates at an “enhanced” level of monitoring as per DFO’s “Strategic Framework for Fishery Monitoring and Catch Reporting in the Pacific Fisheries”.

100% dockside validation is required for all catch within the sardine fishery. Further details of the sardine monitoring program can be found in Appendix 5. Incidental catch statistics can be found in Appendix 1.

A copy of the “Salmon Bycatch and Discard Management Framework” can be found in Appendix 11.

4.2.2. Management of Discards

There are minimal discards occurring in the sardine fishery. DFO aims to accurately account for all releases and discards as per the policies contained in the Sustainable Fisheries Framework.

Currently, releases of sardine are estimated in logbooks and also recorded in at-sea observer reports. The sardine fleet utilizes best practices in order to reduce the amount of sardine releases to the extent possible, for example: setting on appropriate sized schools of sardine, releasing before pumping/drying up, and sharing of harvest with other sardine vessels to minimize wastage.

4.3. Gear Impacts

The sardine fishery is conducted using seine gear and under normal operating circumstances, there is minimal to no environmental impacts (i.e. sea bottom contact) from gear used. To date, there is very little by-catch observed and little to no impact to marine mammals or sea birds. However, all interactions are required to be recorded within logbooks so that management can continue to monitor bycatch within the fishery and develop management measures as required.

4.4. Communal Commercial Licence Distribution

Beginning in 2006, the process used in the distribution of communal commercial licences has included an initial application process for participants in the previous year and a lottery process for any remaining licences after a deadline. Due to an increased interest in the sardine fishery, 2008 was the first year in which all 25 available licences were issued. Since 2009, all 25 licences were issued to those who participated in the previous year and no lottery process has taken place.

Concerns with the lack of opportunity to apply for additional access under the current licensing process have been raised by some participants at First Nation sardine workshops with several different solutions suggested.

However, it remains unclear at this time which of the alternatives suggested has support from First Nations. The Department will continue to work collaboratively with interested parties to develop a consensus proposal.

Until a change in licensing distribution occurs, the established licensing process for communal commercial licences will remain in place, as it provides a method for issuing licences annually to twenty-five participants through a priority application process (which provides stability for past participants issued licences in previous years) and a lottery process opportunity (which is fair and available broadly) for any remaining licences after the priority application deadline date has passed.

The Department is interested in developing a long-term process to allocate the twenty-five communal commercial licences with the objective of increasing stability and certainty for communal commercial participants. Developing a long-term licensing process will require extensive consultations with First Nation groups, SIAB, and other interested parties. The communal commercial licence application process is detailed in Appendix 5.

To provide feedback or recommendations on a long term process to distribute communal commercial licences, please contact a SIAB representative (in Appendix 9) or the Sardine Resource Manager.

4.5. Depleted Species Concerns

4.5.1. Committee on the Status of Endangered Wildlife Species Assessments (COSEWIC)

COSEWIC was formed in 1977 to provide Canadians with a single, scientifically sound classification of wildlife species at risk of extinction. COSEWIC began its assessments in 1978 and has met each year since then to assess wildlife species.

With the implementation of the *Species at Risk Act* (SARA), COSEWIC was established as an independent body of experts responsible for identifying and assessing wildlife species considered to be at risk. This is the first step towards protecting wildlife species at risk. Subsequent steps include COSEWIC reporting its results to the Canadian government and the public, and the Minister of Environment's official response to the assessment results. Wildlife species that have been designated by COSEWIC may then qualify for legal protection and recovery under SARA.

For a full list of species identified and assessed by COSEWIC, please visit:

http://www.cosewic.gc.ca/rpts/Detailed_Species_Assessments_e.html

4.5.2. Species at Risk Act (SARA)

The *Species at Risk Act* (SARA) came into force in 2003. The purposes of the *Act* are “to prevent wildlife species from being extirpated or becoming extinct, and to provide for the recovery of a 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.” More information on SARA can be found at

<http://www.sararegistry.gc.ca>

In addition to the existing prohibitions under the Fisheries Act, under SARA it is illegal to kill, harm, harass, capture, take, possess, collect, buy, sell or trade any listed endangered or threatened animal or any part or derivative of an individual. These prohibitions apply unless a person is authorized, by a permit, licence or other similar document issued in accordance with SARA, to engage in an activity affecting the listed species or the residences of its individuals. Species listed as special concern are not included in these prohibitions.

Endangered, threatened, and special concern species in Pacific region currently listed under SARA can be found at:

<http://www.dfo-mpo.gc.ca/species-especes/listing-eng.htm>

Some marine species in Pacific region currently listed under SARA that you may encounter include:

1. Basking Shark - Endangered
2. Blue Whale – Endangered
3. Killer Whale Southern Resident Population – Endangered
4. Killer Whale Northern Resident Population – Threatened
5. Killer Whale Transient Population – Threatened
6. Leatherback Turtle – Endangered
7. North Pacific Right Whale – Endangered
8. Sei Whale – Endangered
9. Fin Whale – Threatened
10. Humpback Whale – Special Concern
11. Grey Whale – Special Concern
12. Harbour Porpoise – Special Concern
13. Killer Whale Offshore Population – Threatened
14. Steller Sea Lion – Special Concern
15. Longspine Thornyhead – Special Concern
16. Roughey Rockfishes Types I & II – Special Concern
17. Bluntnose Sixgill Shark – Special Concern
18. Tope (Soupfin) Shark – Special Concern

Some marine or anadromous species of fish designated at risk by COSEWIC that are currently under consideration for listing under SARA include:

- Bocaccio Rockfish – Endangered
- Canary Rockfish – Threatened
- Darkblotched Rockfish – Special Concern
- Quillback Rockfish – Threatened
- Yellowmouth Rockfish – Threatened
- North Pacific Spiny Dogfish – Special Concern
- Eulachon, Fraser River Population – Endangered

- Eulachon, Central Pacific Coast Population – Endangered
- Eulachon, Nass/Skeena Population – Special Concern
- Northern Fur Seal - Threatened

Whale, Leatherback Turtle and Basking Shark Sightings

DFO welcomes assistance in the reporting of any whale, basking shark, leatherback turtle sightings or entanglements. Sightings for basking shark, leatherback turtles and many whale species are infrequent in Pacific Canadian waters, and the collection of sightings data is very useful to scientists in determining population size and distribution. Establishing this information can in turn help in the recovery planning under SARA.

To report a whale sighting, contact the BC Cetacean Sighting Network:

Toll free: 1-866-I-SAW-ONE (1-866-472-9663)

Fax: (604) 659-3599

Email: sightings@vanaqua.org

Whales: <http://wildwhales.org/sightings/>

Turtles: <http://www.bcreptiles.ca/reportsightings.htm#1>

To report sick, injured, distressed or dead marine mammals and sea turtles contact the Marine Mammal Incident Reporting Hotline:

Toll free: 1-800-465-4336

To report a basking shark, contact the Basking Shark Sightings Network:

Toll free: 1-877-50-SHARK

Email: BaskingShark@dfo-mpo.gc.ca

<http://www.pac.dfo-mpo.gc.ca/SharkSightings>

Please reference your Conditions of Licence for specific requirements related to incidental catch.

Shark Codes of Conduct

Out of the fourteen shark species in Canadian waters, three species are listed under SARA. The Basking Shark (*Cetorhinus maximus*) is listed as Endangered, and the Bluntnose Sixgill Shark (*Hexanchus griseus*) and Tope Shark (*Galeorhinus galeus*) are listed as species of Special Concern. The primary threats to shark species have been identified as bycatch and entanglement. In order to address the conservation concerns with shark species, it is important that measures are taken to reduce the mortality of sharks resulting from bycatch and entanglement. As such, commercial fishing licences have been amended to include a Condition of Licence for Basking Sharks that specifies mitigation measures in accordance with SARA permit requirements.

Additionally, two 'Code of Conduct for Shark Encounters' documents have been developed to reduce the mortality of Basking Shark, as well as other Canadian Pacific shark species such as Bluntnose Sixgill and Tope Shark resulting from entanglement and bycatch in commercial,

aquaculture, and recreational fisheries. These guidelines include boat handling procedures during visual encounters with Basking Sharks, as well as best practices for handling Canadian Pacific shark species during entanglement encounters. These documents have been posted online and can be found at the following links:

Code of Conduct for Sharks:

http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especes/shark-requin/conduct_shark-conduite_requin-eng.html

Code of Conduct for Basking Sharks:

http://www.pac.dfo-mpo.gc.ca/fm-gp/species-especes/shark-requin/conduct_basking-conduite_pelerin-eng.html

4.6. Oceans and Habitat Considerations

4.6.1. Oceans Act

In 1997, the Government of Canada enacted the *Oceans Act*. This legislation provides a foundation for an integrated and balanced national oceans policy framework supported by regional management and implementation strategies. In 2002, Canada's Oceans Strategy was released to provide the policy framework and strategic approach for modern oceans management in estuarine, coastal, and marine ecosystems. As set out in the *Oceans Act*, the strategy is based on three principles: sustainable development, integrated management, and the precautionary approach. As goals, objectives and management plans are finalized for these initiatives; the Department's management of fisheries will be adapted as appropriate, in consultation with interest parties through Integrated Fisheries Management Processes.

For more information on the *Oceans Act*, please visit:

<http://www.pac.dfo-mpo.gc.ca/oceans/index-eng.htm>

4.6.2. Pacific North Coast Integrated Management Area

An integrated management plan for the Pacific North Coast Integrated Management Area (PNCIMA) has been developed to help coordinate various ocean management processes and to complement and link existing processes and tools, including IFMPs. The PNCIMA is one of five national Large Ocean Management Areas identified in Canada's 2005 Oceans Action Plan, and the plan is the product of a collaborative process led through an oceans governance agreement between the Government of Canada, B.C. and First Nations, and contributed to by a diverse group of organizations, stakeholders and interested parties. High level and strategic, the plan provides direction on and commitment to integrated, ecosystem-based and adaptive management of marine activities and resources in the planning area as opposed to detailed operational direction for management.

The plan outlines a framework for ecosystem-based management (EBM) for PNCIMA that includes assumptions, principles, goals, objectives and strategies. This EBM framework has been developed to be broadly applicable to managers, decision-makers, regulators, community

members and resource users alike, as federal, provincial and First Nations governments, along with stakeholders, move together towards a more holistic and integrated approach to ocean use in the planning area.

Implementation of the plan is the shared responsibility of all signatories to the planning process and will be undertaken within existing programs and resources.

An electronic copy of the plan will be available online at:

<http://pncima.org/>

4.6.3. Marine Protected Area Networks

The *Oceans Act* mandates the Minister of Fisheries and Oceans with leading and coordinating the development and implementation of a national system (or network) of marine protected areas. The *National Framework for Canada's Network of Marine Protected Areas (National Framework)* provides strategic direction for the design of a national network of marine protected areas (MPAs) that will be composed of a number of bioregional networks. This is an important step towards meeting Canada's domestic and international commitments to establish a national network of MPAs. Regionally, the Canada – British Columbia Marine Protected Area Network Strategy has been developed jointly by federal and provincial agencies and reflects the need for governments to work together to achieve common marine protection and conservation goals. Bioregional MPA network planning will identify new areas of interest for protection by DFO, Parks Canada, Environment Canada, the Province of BC, and any other agencies with a mandate for protecting marine spaces. Future networks of MPAs may overlap and/or include tuna fishing areas, depending on the type and nature of the MPA. More information on integrated management planning and Pacific MPAs under Canada's *Oceans Act* can be found at:

<http://www.pac.dfo-mpo.gc.ca/oceans/index-eng.htm>

4.6.4. Marine Protected Areas

DFO is responsible for designating MPAs under Canada's *Oceans Act*. Under this authority, DFO has designated two MPAs in the Pacific Region. The Endeavour Hydrothermal Vents, designated in 2003, lie in waters 2,250 m deep 250 km southeast of Vancouver Island. The SGaan Kinghlas-Bowie Seamount Marine Protected Area (SK-B MPA), designated in 2008, is 180 km west of Haida Gwaii, rising from a depth of over 3,000 m to within 25 m of the sea surface. MPA regulations and management plans articulate any restrictions on activities taking place within the MPA, where applicable.

With respect to fishing activities, the SK-B MPA regulations state:

1. No person shall a) disturb, damage or destroy, or remove from the Area, any living marine organism or any part of its habitat; or b) carry out any activity – including depositing, discharging or dumping any substance – that is likely to result in the disturbance, damage, destruction or removal of a living marine organism or any part of its habitat.
2. Despite section 3, the following activities may be carried out in the Area:

- a. commercial fishing that is carried out in accordance with the *Fisheries Act* and its regulations;
- b. recreational fishing that is carried out in accordance with the *Fisheries Act* and its regulations;
- c. fishing that is carried out in accordance with the *Aboriginal Communal Fishing Licences Regulations*

At this time, all fisheries are restricted within the Endeavour and SK-B MPAs, except for a Sablefish trap fishery permitted only in Zone 2 of the SK-B MPA through a condition of licence.

Work is ongoing to obtain MPA designations for other areas along the Pacific Coast, including the Race Rocks area off Rocky Point south of Victoria (currently designated as a Provincial Ecological Reserve) and the Hecate Strait / Queen Charlotte Sound Glass Sponge Reefs. Changes to existing IFMPs with respect to fishing activities may be required upon designation of these MPAs. In addition, alignment of IFMPs and MPA Management Plans will be necessary.

4.6.5. National Marine Conservation Areas

Gwaii Haanas:

Gwaii Haanas National Park Reserve, National Marine Conservation Area Reserve, and Haida Heritage Site (hereafter Gwaii Haanas) is a 5,000 km² land-and-sea protected area in the southern portion of Haida Gwaii (formerly the Queen Charlotte Islands), approximately 100 kilometres off the north coast of B.C.. The Haida Nation declared the area a Haida Heritage Site in 1985. The terrestrial part of Gwaii Haanas was designated a National Park Reserve by the Government of Canada soon after, and the two parties have been managing the area cooperatively since 1993. In 2010, following an extensive public consultation process, the marine area of Gwaii Haanas was given the designation of National Marine Conservation Area Reserve.

Gwaii Haanas is managed by the Archipelago Management Board (AMB), a cooperative body made up of equal representation from the Government of Canada (represented by Fisheries and Oceans Canada and Parks Canada) and the Council of the Haida Nation. The Gwaii Haanas marine area is currently managed under the Interim Management Plan and Zoning Plan, which includes “balancing protection and ecologically sustainable use” in its guiding principles. The Zoning Plan identifies six areas, described below, that are closed to commercial and recreational fishing.

Development of a long-term management plan for the Gwaii Haanas marine area is underway and is scheduled to be completed in 2015. This process will take place in consultation with the commercial and recreational fishing sectors through Fisheries and Ocean’s established integrated fisheries planning and advisory processes. Annual fishing plans will be developed in consultation with stakeholders.

Users of the Gwaii Haanas marine area should be aware that adjacent land is managed under the authority of the Canada National Parks Act and its regulations and, as specified in the Gwaii Haanas Agreement (1993), there is "no extraction or harvesting by anyone of the resources of the lands and non-tidal waters of the Archipelago for or in support of commercial enterprise" (s3.3). There are specific requirements for visiting the terrestrial portion of Gwaii Haanas, and advanced planning is necessary. Please contact the Gwaii Haanas administration office at 1-877-559-8818 for further information.

Detailed information on Gwaii Haanas closures can be found in Appendix 5.

Southern Strait of Georgia:

Parks Canada, in partnership with the Government of B.C., launched a feasibility assessment for an NMCA reserve in the southern Strait of Georgia in 2004. Since then, consultations with First Nations, key stakeholders, communities and the public have occurred. Informed by those discussions, a proposed boundary for consultation was announced by the provincial and federal Ministers of Environment in 2011. Since 2011, the two governments have been consulting with First Nations, local governments and industry. A preliminary concept is currently being developed to help advance consultations on the feasibility assessment. If the results of the feasibility assessment indicate that establishment of an NMCAR is practical and feasible, an establishment agreement between the Governments of Canada and B.C. will be negotiated and an interim management plan developed. If the NMCAR is determined to be feasible, further consultations related to establishment agreements and Aboriginal rights will also take place with First Nations. Commercial and recreational fishing sectors, communities, landowners, recreation and environmental organizations and other stakeholders will also have opportunities to provide input to the development of the interim management plan. More information on the proposed National Marine Conservation Area Reserve in the Southern Strait of Georgia is available on the internet at:

www.pc.gc.ca/eng/progs/amnc-nmca/dgs-ssg/index.aspx

4.6.6. Marine National Wildlife Areas

Under the *Canada Wildlife Act*, Environment Canada may establish marine National Wildlife Areas (NWAs). The Scott Islands marine National Wildlife Area, located on off the northern tip of Vancouver Island, has been proposed for designation through amendment to the *Wildlife Area Regulations*. Fisheries and Oceans Canada would continue to regulate and administer fisheries within the proposed area. Environment Canada and Fisheries and Oceans will develop a collaborative approach and agreement regarding management of fisheries in the area.

More information on NWAs can be found at:

<http://www.ec.gc.ca/ap-pa/default.asp?lang=En&n=2BD71B33-1>

4.7. International Considerations

No formal fishery management agreement exists between Canadian, U.S. and Mexican governing agencies on coordinated approaches to assessment or management frameworks. However, understanding the biology and productivity of Pacific Sardine has been facilitated by the annual Trilateral Sardine Forum between Mexico, the U.S., and Canada. The forum was initiated in 2000 and brings together scientists, academics, and industry to discuss issues surrounding the sardine resource, including planning joint surveys and collaborative research studies and tackling questions of importance to the sardine industries in all three countries.

Widespread and growing concern over the state of the world's industrial fisheries, many of which suffer from resource over-exploitation and fleet over-capacity, have led to international agreements on the conduct of fisheries. These agreements include the *UN Straddling Fish Stocks and Highly Migratory Fish Stocks Agreement* (otherwise known in Canada as the UN Fisheries Agreement or UNFA), the *Food and Agriculture Organization Code of Conduct for Responsible Fisheries*, the *International Plan of Action (IPOA) for the Management of Fishing Capacity*, and the *UN Compliance Agreement*. These all require a precautionary approach to fisheries management and Flag State control over fishing vessels, wherever they fish.

5. OBJECTIVES

5.1. National

Fisheries and Oceans Canada aims to:

- Meet conservation objectives and ensure healthy and productive fisheries and ecosystems;
- Base management decisions on the best available scientific information;
- Manage fisheries to provide opportunities for economic prosperity;
- Provide stability, transparency, and predictability in fisheries management and improved governance; and,
- Foster shared stewardship.

5.2. Pacific Region

The overall goal of Fisheries Management in the Pacific Region is the conservation of Canada's fisheries resources to ensure sustainable resource utilization and generate economic prosperity, accomplished through close collaboration with resource users and stakeholders based on shared stewardship consistent with treaty and Aboriginal rights. Fisheries Management is responsible for management of the Aboriginal, commercial, and recreational fishing in the Pacific Ocean and creating the conditions for a vibrant and innovative aquaculture industry.

Fisheries Management will continue to develop and implement the Sustainable Fisheries Framework by integrating the precautionary and ecosystem approach frameworks into IFMPs with the goal of protecting vulnerable marine and freshwater ecosystems and vulnerable stocks from significant adverse impacts, and to help ensure long term sustainability and support economic prosperity.

5.3. Pacific Sardine Resource Management

5.3.1. Stock Conservation

The biological objective is to harvest the available biomass in a sustainable manner in consideration of the fluctuating population and migration rate of sardine into Canadian waters and impacts to the surrounding ecosystem.

5.3.2. Ecosystem Processes

To ensure conservation and protection of Pacific Sardine stocks, their habitat, and manage for ecosystem impacts of fish harvest activities, scientific management principles will be applied in a risk adverse and precautionary manner based on the best scientific advice available, and through comprehensive monitoring of fish harvest activities.

5.3.3. Consultation

An open and transparent consultation process will be developed and maintained for discussions of harvest management issues for the Pacific Sardine fishery, including the annual development of an IFMP, long-term direction of the fishery, and to increase information posted on the DFO consultation website to allow for a wide review of all relevant material.

5.3.4. Social, Cultural, and Economic Considerations

First Nations: the Department will continue to provide opportunities for First Nations to harvest for food, social and ceremonial purposes, in a manner consistent with the *Sparrow Decision* (SCC 1990), and other court decisions.

For more information, see Appendix 3 or visit:

<http://www.pac.dfo-mpo.gc.ca/abor-autoc/index-eng.htm>

Recreational: the Department will continue to provide opportunities for a recreational fishery for sardine. See Appendix 4 for more detail.

Commercial and Communal Commercial: The Department will continue to work collaboratively with harvesters to maximize the long term profitability and stability of the Pacific Sardine fishery in a manner that ensures long-term sustainability of the resource. Please see Appendix 5 for more detail.

5.3.5. Compliance Objectives

Fisheries and Oceans Canada aims to continue implementing a comprehensive monitoring program and annually assessing compliance with the program which includes a hail and logbook program, at-sea observer coverage and 100% dockside validation.

Details on performance measures to meet the above objectives are described section 10.

6. ACCESS AND ALLOCATION

The Minister can, for reasons of conservation or for any other valid reasons, modify access, allocations, and sharing arrangements as outlined in this IFMP in accordance with the powers granted pursuant to the *Fisheries Act*.

6.1. Quotas and Allocations

6.1.1. First Nations

Aboriginal harvest of Pacific Sardine for FSC purposes may occur coast wide where authorized by a communal licence. To date, no limits have been placed on aboriginal harvest for food, social and ceremonial purposes. There is no known FSC fishery for sardine.

6.1.2. Recreational

Recreational harvest of Pacific Sardine may occur coast wide if authorized by a B.C. Tidal Waters Sport Fishing Licence. The daily limit for Pacific Sardine is 100 pieces and the possession limit is 200 pieces.

6.1.3. Commercial

Total Allowable Catch (TAC)

For setting annual TACs for the 2002 to 2012 sardine fisheries, the Department applied a Fishery Management Framework that set the maximum annual TAC for sardine based on annually updated biomass estimates of age 1 year and older (1+) fish in the population, an estimated average seasonal migration rate of sardine into Canadian waters, and a regional harvest rate. Harvest control rule parameters applied to those fishing seasons included average migration rate estimates that ranged from 10-27% and a regional harvest rate of 15% (DFO 2002; DFO 2009; DFO 2011; DFO 2012).

Estimates of sardine migration into BC waters were based on ratios of historical catch estimates and observations from annual BC summer trawl surveys and resulting estimates of regional sardine biomass in BC waters. Given the uncertainty associated with estimating BC sardine migration (and resulting forecasts of BC sardine biomass) and in anticipation of reductions in funding available for BC sardine research and management, DFO Fisheries Management worked with DFO Science and industry to consider four alternative harvest control rule approaches prior to the 2013 season (DFO 2013). Based on the results from a science review, and after consultation with the SIAB, Fisheries Management decided to use the harvest control rule which sets the TAC at a harvest rate of between 3 to 5% of the difference between age 1+ population biomass minus a cut-off of 150,000t, beginning in the 2013 season.

This decision to use an alternative sardine harvest control rule was based on the Fisheries Management objectives to: implement multi-year science advice; enable annual harvest levels that are opportunistic given the variable nature of sardine abundance in BC waters; move towards a more stable estimate of migration or a more stable combined migration and harvest rate term in the harvest control rule; and, maintain a relatively low risk to the status of the stock, to habitat and other ecosystems. Please see Appendix 5 for updated TAC levels for the current year.

50% of the TAC is allocated to communal commercial licences for First Nations use and 50% of the TAC is allocated to commercial licences. Every licence within each category (25 communal commercial and 25 commercial licences) is subsequently allocated an equal share of the TAC.

Incidental Catch

Vessels are permitted to harvest a maximum of 10 metric tonnes of Chub and Jack Mackerel. Retention of mackerel is intended to reduce wastage of mackerel normally encountered when fishing for Pacific Sardine and not to create a directed mackerel fishery. All mackerel retained must be recorded in the sardine harvest logbook and validated at dockside.

All other incidental catch shall be released to the place in which it was taken and in a manner that causes the least harm.

7. MANAGEMENT MEASURES FOR THE DURATION OF THE PLAN

Please see the Aboriginal, Recreational and Commercial Harvest Plans, Appendices 3 to 5 for details on the management of the Pacific Sardine fishery including:

- Total Allowable Catch (TAC);
- Fishing Seasons/Areas;
- Control and Monitoring of Removals;
- Decision Rules;
- Licensing;
- Habitat Protection Measures.

8. SHARED STEWARDSHIP ARRANGEMENTS

Stewardship refers to the care, supervision or management of something, especially the careful and responsible management of something entrusted to one's care. In the context of fisheries management, stewardship is often referenced in regards to "shared stewardship", whereby participants will be effectively involved in fisheries management decision-making processes at appropriate levels, will contribute specialized knowledge and experience, and share in accountability for outcomes.

The Department and the sardine industry have a long and productive history of working together in a co-managed fashion to improve the sustainability and economic prosperity of Pacific fisheries. Given the co-management arrangements since the inception of this fishery, the Department's goal is to continue engaging all Pacific Sardine fish harvesters in the co-management process.

As in previous years and consistent with the development of the sardine fishery under the New Emerging Fisheries Policy (NEFP), a tripartite Joint Project Agreement (JPA) with The First Nation Sardine Association (FNSEA) and the Canadian Pacific Sardine Association (CPSA) continues to be in place for the cost sharing of science and management activities related to the fishery.

Table 2: Financial contributions in recent years by industry associations to the JPA

<u>Year</u>	<u>CPSA Contribution</u>	<u>FNSEA Contribution</u>	<u>Total Industry Funding</u>
2009	\$40,500	\$40,500	\$81,000
2010	\$38,500	\$38,500	\$77,000

2011	\$31,500	\$31,500	\$63,000
2012	\$35,000	\$35,000	\$70,000
2013	\$5,000	\$5,000	\$10,000
2014	\$1,250	\$1,250	\$2,500

Each year, the Department works with industry associations to develop the JPA based on science and management priorities for the coming season and in consideration of the cost to harvesters.

In-kind costs borne by the Department have and will continue to include infrastructure, management, science, enforcement, travel, licensing, and administration.

The Department (after sardine industry consultations) and a DFO certified third party monitoring company have cooperatively planned and administered the sardine logbook program. This monitoring program, including coordination, distribution and submission of data, is fully funded by industry.

9. COMPLIANCE PLAN

The Conservation and Protection (C&P) program promotes and maintains compliance with legislation, regulations and management measures implemented to achieve the conservation and sustainable use of Canada’s aquatic resources, and the protection of species at risk, fish habitat and oceans.

The program is delivered through a balanced regulatory management and enforcement approach including:

- Promotion of compliance through education and shared stewardship;
- Monitoring, control and surveillance activities; and,
- Management of major cases/special investigations in relation to complex compliance issues

These activities are further outlined in the C&P National Compliance Framework.

There are approximately 173 Fishery Officers stationed in the Pacific region, which encompasses B.C. and Yukon Territory. They are designated as “Fishery Officers” under Section 5 of the *Fisheries Act*. The *Fisheries Act* and the *Criminal Code of Canada* are the primary pieces of legislation outlining the powers and responsibilities of Fishery Officers. Officers are designated under other Acts as well, such as the *Coastal Fisheries Protection Act* and *Species at Risk Act*.

Users of the resource have a responsibility to report violations. Any suspected or actual fisheries, wildlife or pollution violations can be quickly and discretely reported to the appropriate enforcement officer by using the toll free Observe, Record and Report hotline. This toll free number is available 24 hours a day.

OBSERVE, RECORD and REPORT: 1-800-465-4DFO (1-800-465-4336)

Enforcement enquiries can also be directed to the local field offices during regular office hours.

9.1. Regional Compliance Program Delivery

Enforcement of the sardine fishery will be tempered by commitments to higher priority issues, such as species at risk, CSSP and fisheries that have conservation concerns. C&P staff will pursue opportunities to monitor and enforce problems related to the sardine fishery in conjunction with the monitoring and enforcement activities dedicated to the identified priority fisheries in the Pacific region.

Fishery Officers conduct a range of activities to promote compliance during the sardine fishery. These activities include attending industry and working group meetings, defining key enforcement concerns with Fisheries Management prior to the commercial fishery, in-season monitoring of compliance with Conditions of Licence, aerial surveillance, and detailed post-season reporting.

9.2. Aerial Surveillance

Air surveillance is done under two different programs. For shore-oriented, localized enforcement and monitoring needs, local air charters are contracted on an as-needed basis. In addition, there is a more comprehensive offshore air surveillance program. The purpose of this program is to monitor vessels and track activities off the west coast as well as obtain vessel counts from recreational, commercial and in some cases, First Nations fisheries and to detect suspicious vessels (e.g., those suspected of fishing in closed areas). Aircraft are tasked on a daily basis for specific surveillance duties. On occasion Canadian Coast Guard fixed wing and helicopter craft are also employed depending on availability. Air surveillance is an excellent platform for monitoring the activities of vessels at sea.

9.3. Compliance Performance

Information regarding the compliance performance objectives from the previous season is available in Section 10 and Appendix 1.

10. PERFORMANCE / EVALUATION CRITERIA

10.1. National

- Meet conservation objectives that ensure healthy and productive fisheries and surrounding ecosystems.
- Make reasonable effort to provide opportunities for economic prosperity while maintaining conservation objectives.
- Conduct stable, transparent and predictable consultation and management processes.

10.2. Pacific Region

- Execution of the sardine fishery in accordance with the requirements outlined in the IFMP.

- Ensure monitoring program provides accurate information on catch and effort and is designed to provide the information necessary for management of the sardine resource.
- Proper controls in place for management and control of the fishery and the conservation and protection of fish.
- Stakeholder engagement for informed management decisions and cooperatively developed solutions to issues related to management of the sardine fishery

10.3. Pacific Sardine Resource Management

10.3.1. Stock Conservation and Ecosystem Processes

- Conduct surveys of sardine off the west coast of Vancouver Island to monitor regional and seasonal sardine abundance and distribution and to obtain biological samples related to sardine ecology.
- Coordinate with U.S. fishery scientists to provide data, when available, from annual surveys and commercial catches in Canadian waters into the U.S. Stock Synthesis assessment of the California Current sardine population.
- In association with alternative harvest control rule approved in 2013, a range of 3-5% of the estimated age 1+ population biomass in excess of a 150,000 t cut-off will be considered for setting annual BC sardine fishery allowances in following with goals of sustainability.
- Continue a comprehensive monitoring program to gather catch and biological information for the sardine fishery with 100% validation of all harvest.
- Review harvest activities so they occur in a manner that will minimize impacts to sensitive fish habitats and populations.
- Support ongoing collaborative research activities that support the precautionary approach to management for Pacific Sardine in BC.

10.3.2. Consultation

- Hold pre-season planning meetings and seek stakeholder advice (through SIAB and bi-lateral discussions with First Nations) on development of the IFMP allowing 30 days for review and feedback on IFMP draft content.
- Facilitate consensus building among stakeholders on issues related to the management of the fishery.
- Hold post-season meetings to review issues encountered during the season and to develop options for addressing and resolving them.

10.3.3. Social, Cultural and Economic Considerations

First Nations:

DFO will consult with First Nations in order to determine their FSC requirements. In accordance with the *Sparrow Decision* (SCC 1990), and other court decisions, First Nations will be authorized to fish for FSC purposes through use of a communal licence.

Commercial:

Through post-season reviews and data analysis, assess catch monitoring and reporting, and other management measures.

10.3.4. Compliance

- Monitor compliance with Conditions of Licence including the monitoring and validation program.

11. REFERENCES

- Baumgartner, T.R., A. Soutar, and V. Ferreira-Bartrina. 1992. Reconstruction of the history of Pacific Sardine and northern anchovy populations over the past two millennia from sediments of the Santa Barbara Basin, California. *CalCOFI Rep.*, 33, 40 pp.
- DFO 2002. Pacific Region Integrated Fisheries Management Plan for Pacific Sardine 2002/2003. Government of Canada.
- DFO 2009. Pacific Region Integrated Fisheries Management Plan for Pacific Sardine (June 1, 2009 to February 9, 2010). <http://www.dfo-mpo.gc.ca/Library/337019.pdf>
- DFO 2011. Pacific Region Integrated Fisheries Management Plan for Pacific Sardine (June 1, 2011 to February 9, 2012). <http://www.dfo-mpo.gc.ca/Library/343552.pdf>
- DFO 2012. Pacific Region Integrated Fisheries Management Plan for Pacific Sardine (June 1, 2012 to February 9, 2015). <http://www.dfo-mpo.gc.ca/Library/346938.pdf>
- DFO 2013 in press. Review of harvest control rules for Pacific Sardine and seasonal biomass and migration in British Columbia for 2013. *DFO Can. Sci. Advis. Sec. Sci. Advis. Rep.* 2013/037
- Flostrand, L., Schweigert, J., Detering, J., Boldt, J., and MacConnachie, S. 2011. Evaluation of Pacific Sardine stock assessment and harvest guidelines in British Columbia. *DFO Can. Sci. Advis. Sec. Res. Doc.* 2011/096.
- Hill, K.T., Crone, P., Lo, N.C.H., Demer, D.A., Zwolinski, J.P., and Macewicz, B.J. 2012. Assessment of the Pacific Sardine resource in 2012 for U.S. management in 2013. *Pacific Fishery Management Council, Nov 2012 Briefing Book, Agenda Item I.2.b.* 193 p.
- McFarlane, G.A., Smith, P.E., Baumgartner, T.R., and Hunter, J.R. 2002. Climate variability and Pacific Sardine populations and fisheries, p.195-214, *in* N.A. McGinn [ed], *Fisheries in a changing climate.* American Fisheries Society, Symposium 32, Bethesda, Maryland.
- Schweigert, J. and McFarlane, G.A. 2001. Stock assessment and recommended harvest for Pacific Sardine in 2002. *DFO Can. Sci. Advis. Sec. Res. Doc.* 2001/126. 12p.
- Schweigert, J., McFarlane, G.A., and Hodes, V. 2010. Pacific Sardine (*Sardinops sagax*) biomass and migration rates in British Columbia. *DFO Can. Sci. Advis. Sec. Res. Doc.* 2009/088. 14p.

- Valdes, J., L. Ortlieb, D. Gutierrez, L. Marinovic, G. Vargas, and A. Sifeddine. 2008. 250 years of sardine and anchovy scale deposition record in Mejillones Bay, northern Chile. *Progr. Oceanogr.* 79: 198-207.
- Ware, D.M. 2001. Forecasting the time of arrival and availability of Pacific Sardine in British Columbia. Unpublished manuscript prepared for DFO and B.C. Sardine Association. 22p.
- Ware, D. M., and. Thompson, R. E. 1991. Link between long-term variability in upwelling and fish production in the northeast Pacific Ocean. *Can. J. Fish. Aquat. Sci.* 48:2296-2306.

12. GLOSSARY

Aboriginal Traditional Knowledge (ATK)	Knowledge that is held by, and unique to Aboriginal peoples. It is a living body of knowledge that is cumulative and dynamic and adapted over time to reflect changes in the social, economic, environmental, spiritual, and political spheres of the Aboriginal knowledge holders. It often includes knowledge about the land and its resources, spiritual beliefs, language, mythology, culture, laws, customs and medicines.
Abundance	Number of individuals in a stock or a population.
Age Composition	Proportion of individuals of different ages in a stock or in the catches.
Area and Subarea	Defined in Section 2 of the Pacific Fishery Management Area Regulations. A map of Pacific Fishery Management Areas is available on the Department's Internet site at: www.pac.dfo-mpo.gc.ca/ops/fm/Areas/areamap_e.htm
Biomass	Total weight of all individuals in a stock or a population.
Committee on the Status of Endangered Wildlife in Canada (COSEWIC)	Committee of experts that assess and designate which wild species are in some danger of disappearing from Canada.
Communal Commercial Licence	Issued to First Nation organizations pursuant to the Aboriginal Communal Fishing Licences Regulations for participation in the general commercial fishery. Licences issued are equivalent to the capacity of licences that have been retired under the Treaty and Aboriginal Policy Directorate Licence Retirement/Allocation Transfer Program.
Communal Licence	A licence issued to First Nations organizations under Section 4 of the Aboriginal Communal Fishing Licences Regulations, pursuant to the Fisheries Act, to carry on fishing and related activities.
CSAS	Canadian Scientific Advice Secretariat, chaired by DFO and including other federal and provincial government agency representatives and external participants.
Dockside Monitoring	A monitoring program that is conducted by a company that has been designated

Program (DMP)	by the Department, which verifies the species composition and landed weight of all fish landed from a commercial fishing vessel.
EBSA (Ecologically and Biologically Significant Area)	An EBSA is an area that has particularly high Ecological or Biological Significance, and should receive a greater-than-usual degree of risk aversion in management of activities in order to protect overall ecosystem structure and function within the LOMA.
Ecosystem-Based Management	Taking into account of species interactions and the interdependencies between species and their habitats when making resource management decisions.
Enhancement	The culture and release of wild stocks for stock rehabilitation and/or to increase stock sizes above natural levels of abundance. An enhanced stock is a common property resource and is subject to the public right to fish.
Fishing Effort	Quantity of effort using a given fishing gear over a given period of time.
Fishing Mortality	Death caused by fishing, often symbolized by the mathematical symbol F .
Food, Social and Ceremonial (FSC)	A fishery conducted by Aboriginal groups for food, social and ceremonial purposes.
Harvest Quotas	A fixed amount of catch provided as an opportunity for harvest to a licensed fisher or vessel.
High Grading	Sorting through the catch and discarding less desirable animals (small, dark, other characteristics) underwater at the time of harvest, or on board the vessel.
Incidental Catch	The unintentional catch of one species when the target is another
Individual Vessel Quota (IVQ)	Individual Vessel Quota: a portion of the total allowable catch (TAC) allocated annually to an individual vessel licence.
Landed Value	Value of the product when landed by the licensed vessel.
Landing	Quantity of a species caught and landed. Harvested animals transferred from a vessel to land.
LOMA (Large Ocean Management Area)	Integrated management planning in Canada is focused in five high priority LOMAs, these are: Placentia Bay and the Grand Banks, the Gulf of St. Lawrence, the Scotian Shelf, the Beaufort Sea and the Pacific North Coast.
Maximum Sustainable Yield (MSY)	Largest average catch that can continuously be taken from a stock.
Natural Mortality	Mortality due to natural causes, symbolized by the mathematical symbol M .
Observer	An individual who has been designated as an Observer by the Regional Director General for the Pacific Region of Fisheries and Oceans Canada pursuant to section 39 of the Fishery (General) Regulations and in the employ of a service provider company that has been certified by the Canadian General Standards Board (CGSB) for Dockside Monitoring.

Observer Coverage	When a licence holder is required to carry an officially recognized observer onboard their vessel for a specific period of time to verify the amount of fish caught, the area in which it was caught and the method by which it was caught.
Population	Group of individuals of the same species, forming a breeding unit, and sharing a habitat.
Precautionary Approach	Set of agreed cost-effective measures and actions, including future courses of action, which ensures prudent foresight, reduces or avoids risk to the resource, the environment, and the people, to the extent possible, taking explicitly into account existing uncertainties and the potential consequences of being wrong.
Quota	Portion of the total allowable catch that a unit such as vessel class, country, etc. is permitted to take from a stock in a given period of time.
Recruitment	Amount of individuals becoming part of the exploitable stock e.g. that can be caught in a fishery. The process whereby young animals are added to a fishable stock or population.
Research Survey	Survey at sea, on a research vessel, allowing scientists to obtain information on the abundance and distribution of various species and/or collect oceanographic data. E.g.: bottom trawl survey, plankton survey, hydroacoustic survey, etc.
Sampling Program	A program in which representative samples of animals are collected for the calculation of parameter estimates that describe such things as weight, length or age within the general population.
Spawner	Sexually mature individual.
Spawning Stock	Sexually mature individuals in a stock.
Species at Risk Act (SARA)	The Act is a federal government commitment to prevent wildlife species from becoming extinct and secure the necessary actions for their recovery. It provides the legal protection of wildlife species and the conservation of their biological diversity.
Stakeholders	Individuals or groups with an interest in a particular fishery or activity.
Stock	Describes a population of individuals of one species found in a particular area, and is used as a unit for fisheries management.
Stock Assessments	Scientific evaluation of the status of a species belonging to a same stock within a particular area in a given time period. Results of analyses of fisheries and research data used to evaluate the effects of fishing on a stock or population and to predict the reactions of populations to alternative management choices.
Substrate	The ground (often the ocean bottom) and its composition, in or on which animals live.
Tonne	Metric tonne, which is 1000kg or 2204.6 lb.
Total Allowable Catch	Total allowable catch: the amount of catch that may be taken from a stock,

(TAC)	determined by analytical procedures, to achieve management objectives.
Traditional Ecological Knowledge (TEK)	A cumulative body of knowledge and beliefs handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.
Validation	The verification, by an observer, of the weight of fish landed.
Vessel Size	Length overall.
Year-class	Individuals of a same stock born in a particular year. Also called "cohort".

APPENDIX 1. POST-SEASON REVIEW

1. ASSESSMENT OF FISHERY OBJECTIVES FOR 2014

1.1. Stock Conservation and Ecosystem Processes

To ensure the harvest of Pacific Sardine occurs in a sustainable manner in consideration of population dynamics and ecosystem impacts, the Department will:

Performance Measure	DFO Activity
Conduct annual surveys of sardine off the west coast of Vancouver Island to determine regional and seasonal abundance levels and distribution.	<p>In 2014, the trawl survey was conducted from August 5-15, with sample coverage of 59 stations surveyed. No sardines were observed in any of the 59 locations thus estimates of sardine density and biomass were 0. The 2014 season was the second year that no sardines were observed in the trawl survey when spring and summer oceanographic conditions appeared appropriate for their migration and use of habitat.</p> <p>In addition to trawl sampling, other successful sampling included: pelagic fish diet characterization, zooplankton relative abundance and species composition, oceanographic sampling, collection of daytime acoustic data along transects, and marine mammal observations.</p>
Coordinate with U.S. fishery scientists to provide data from annual surveys and commercial catches in Canadian waters into the U.S. assessment of the sardine population.	Canada communicated summer trawl survey and BC sardine fishery observations of no sardine catches in 2013 and 2014 to scientists involved in Stock Synthesis sardine population assessments (i.e. Hill 2013 and Hill et al. 2014 and 2015).
In association with alternative harvest control rule options proposed for the 2013 fishery, a range of 3-5% of the estimated age 1+ population biomass will be considered for setting annual BC sardine fishery allowances in following with goals of sustainability	The 2014 TAC of sardine in BC (of 17,174 tonnes) was based on a harvest control rule that incorporated an estimate of the population's July 2013 age 1+ biomass (493,479 tonnes), an escapement buffer or cutoff value of 150,000 tonnes, and a 5% harvest rate on the difference between the age 1+ biomass and the cutoff. Since no sardine were observed or caught by the 2014 sardine fishery, the 2014 BC regional and population harvest rates were both 0%.

Continue a comprehensive monitoring program to gather catch and biological information for the sardine fishery with 100% validation of all harvest.	Had a fishery occurred in 2014, a monitoring program was in place to include logbooks, third party at sea observers and a dockside monitoring program.
Review harvest activities so they occur in a manner that will minimize impacts to sensitive fish habitats and populations.	No harvest activities occurred therefore no review was warranted, and there was no bycatch.
Support ongoing collaborative research activities that support the precautionary approach to management for Pacific Sardine in BC.	DFO participated at the Trinational Sardine Forum in December 2014 in La Paz, Mexico with colleagues from the U.S. and Mexico. Joint collaborative research opportunities and long term planning was a focus of the forum.

1.2. Consultation

Performance Measure	DFO Activity
Hold a minimum of two advisory board meetings for the purpose of post-season review and pre-season planning discussions.	<p>The Sardine Integrated Advisory Board (SIAB), established in 2005, continued to function as the Department's advisory body in 2014 with two meetings held for review and planning purposes. A pre-season planning meeting was held on April 4, 2014, and a post-season review meeting was held on December 5, 2014.</p> <p>Meeting minutes from 2014 SIAB meetings are publicly available on the DFO sardine consultation website.</p> <p>Additional meetings were held by SIAB subcommittees (Sardine Monitoring Working Group and Sardine Science Steering Committee) were not held in 2014 but continue to be available if required.</p>
Develop annual management plans in consideration of advice and recommendations developed through the Sardine Integrated Advisory Board (SIAB).	SIAB provided formal advice and recommendations to the Department on operational and policy issues taking into account the views of those they represent and departmental policies. These advice and recommendations were taken into the consideration by the Department while developing the 2012-2015 sardine IFMP. Consultation with First Nations was

also conducted by the Department.

1.3. Social, Cultural and Economic Considerations

Performance Measure	DFO Activity
First Nations: DFO will consult with First Nations in order to determine their FSC requirements. In accordance with the <i>Sparrow Decision</i> (SCC 1990), and other court decisions, First Nations will be authorized to fish for FSC purposes through use of a communal licence.	DFO consults with First Nations as required. Currently, there are no FSC fisheries taking place for Pacific Sardine.
Commercial: Through post-season reviews and data analysis, assess catch monitoring and reporting, and other management measures.	DFO conducts post-season reviews and data analysis (including catch monitoring and reporting, and other management measures) via the Sardine Integrated Advisory Board which meets at least twice annually. The Sardine Monitoring Working Group also meets annually to review bycatch and discard statistics, and evaluates the monitoring program according to the objectives set out in the “Salmon Bycatch and Discard Monitoring Framework” (Appendix 11). In 2014, since there was no catch by the sardine fleet, there was no bycatch as well.

1.4. Compliance

Performance Measure	DFO Activity
Monitor compliance with Conditions of Licence including the monitoring and validation program.	In 2014, sardine licence conditions required a DFO certified third-party service provider to implement a comprehensive monitoring program that included a hail and logbook program, an at-sea observer program and 100% dockside validation. All harvest activity was to be monitored in-season to ensure that impacts to sensitive fish habitats and populations were minimized. No harvest activity occurred in 2014 to warrant monitoring.

Appendix 1

2. 2014 CATCH AND EFFORT

The entire sardine TAC (17,174 mt) was allocated for commercial harvest. Consistent with the allocation framework implemented since the start of the fishery, 50% was allocated to First Nations through communal commercial licences and 50% was allocated to commercial licence holders. The TAC was subsequently divided among all available licences resulting in an individual licence quota of 343.5 metric tonnes per licence. A summary of historical harvest levels is outlined in Table 4.

Table 3: Catch and effort summaries from 2002 – 2014

Year	Licences Available	Licences Issued	TAC (mt)	IQ (mt)	Catch (mt)	% TAC Caught
2002	28	14	9,000	180	822	9.10%
2003	50	25	9,000	180	1,006	11.2%
2004	50	27	15,000	300	4,259	28.40%
2005	50	33	15,200	304	3,266	21.50%
2006	50	43	13,500	270	1,558	11.50%
2007	50	45	19,800	396	1,507	7.60%
2008	50	50	12,491	250	10,435	83.50%
2009	50	50	18,196	364	15,334	84.30%
2010	50	50	23,166	463	22,223	95.90%
2011	50	50	21,917	438	20,719	94.50%
2012	50	50	27,279	546	19,172	70.28%
2013	50	33	25,477	510	0	0.00%
2014	50	16	17,174	344	0	0.00%

Usually, a breakdown of landings by month and landings by statistical area would be provided, but there was no sardine catch in 2014.

3. MONITORING PROGRAM

The Pacific Sardine fishery has a third party, DFO certified, industry funded monitoring program and includes a hail and logbook program, at-sea observer coverage and 100% dockside validation.

The program's objective is to accurately monitor catch (target and non-target), effort and fishing activity information to support harvest and management decisions. Levels of incidental catch are extremely low for the Pacific Sardine fishery. However, due to the possibility of incidental catch of wild Chinook populations of concern originating from the west coast of Vancouver Island (WCVI), management measures were implemented in 2013 according to the "Salmon Bycatch and Discard Monitoring Framework" (Appendix 11).

The primary management measures utilized were time and area closures, mandatory excluder systems for all vessels, and a minimum of 25% at-sea observer coverage.

Usually, a summary of salmon incidental catch by piece count and weight of all salmon species (including those released at-sea) would be provided, but there was no sardine catch in 2014 (and therefore no bycatch).

APPENDIX 2. STOCK ASSESSMENT RESULTS

Population Assessment:

The annual stock assessment for the California Current Pacific Sardine population (also referred to as the northern subpopulation that ranges from Mexico to Canada) is conducted by U.S. analysts. Modeling methods and assumptions were reviewed for application to U.S. management of sardine fisheries through the Pacific Fishery Management Council. The annual U.S. assessment of this sardine stock incorporates fishery catch data and research survey data into an age structured Stock Synthesis model which collectively represents sardine abundance from northern Baja Mexico to B.C. (e.g. Hill et al. 2014 and 2015). The model incorporated catch and biological data for fisheries off Ensenada and southern and central California, which were modeled as one fleet (MexCal) and catch and biological data from fisheries off Oregon, Washington and B.C., which were modeled as another fleet (PacNW). Satellite oceanographic data (Demer and Zwolinski 2014) were used to exclude landings and biological compositions attributed to the southern sardine subpopulation from Ensenada and southern California catches (Hill et al. 2014, 2015). This change to the assessment methodology resulted from a general consensus that landings in Ensenada and southern California likely represent a mixture of sardine from the southern and northern subpopulations, where the southern subpopulation was present during warm summer months and the northern subpopulation during cold months (Felix-Uraga et al. 2004, 2005; Zwolinski et al. 2011; Garcia-Morales 2012; Demer and Zwolinski 2014). Indices of abundance informing the 2015 spring assessment (Hill et al. 2015) were based on: daily and total egg production estimates of spawning stock biomass off California (1994-2014), spring and summer acoustic-trawl survey estimates of biomass along the west coast (2006-2014), and aerial survey estimates of biomass off Oregon and Washington (2009-2012). Over the past 10 years, the sum of commercial sardine landings from all regions of the northern subpopulation ranges from ~26,000 to ~180,000 tonnes, with peaks in 2007 and 2012 and a minimum in 2014 (Figure 1).

Results of the 2014 and 2015 population assessments indicated that age 1 year and older (1+) biomass increased after 1993 and peaked in 1999, 2006 and 2007 (Hill et al. 2014, 2015 Figure 2). The Stock Synthesis model estimated strong recruitment for the 2003 and 2005 year classes, which were believed to have contributed large proportions of biomass to the population for several years and to the peak in biomass in 2006 and 2007. Assessment results indicated that stock biomass declined since 2007 and the age 1+ biomass was 113,560 tonnes as of January, 2015 (Hill et al, 2015, Figure 2). Due to poor representation of the 2014 year class in commercial catches and survey observations, there was considerable uncertainty associated with the strength of this year class, but to date there are no indications that it is above average. For forecasting July 2015 age 1+ biomass, the 2015 assessment used two methods of estimating recruitment of the 2014 year class: 1) from a Beverton-Holt modeled relationship, and the other, 2) from an average of recruitment during 2011-2013. Both methods resulted in July 2015 age 1+ biomass forecasts that were below the cut-off of 150,000 tonnes (132,884 and 96,688 tonnes, Figure 3; Hill et al. 2015). Additional information related to the 2014 and 2015 Pacific Sardine stock assessment process is available through Pacific Fishery Management Council internet links via:

<http://www.pcouncil.org/resources/archives/briefing-books/april-2014-briefing-book/#cpsApr2014>

<http://www.pcouncil.org/resources/archives/briefing-books/april-2015-briefing-book/#cpsApr2015>

British Columbia Observations:

During 2002-2012, B.C. sardine fishery TACs ranged from 5,040 to 27,279 tonnes, landings ranged from ~1,000 tonnes to 22,279 tonnes, and estimates of landings-based realized age 1+ biomass exploitation rates showed increases over time ranging from <1% to ~4% (Figure 3). However in 2013 and 2014, there was an apparent absence of Pacific Sardine in B.C. waters and no fishery landings were made.

Data on sardine size, age, biomass, and migration into B.C. waters has been collected during a summer trawl survey off the west coast of Vancouver Island (WCVI). The WCVI trawl survey has been conducted at night since 2006 and has a core survey region with a surface area of 16,740 km² (Flostrand et al 2011). Estimates of sardine trawl survey catch densities have declined since 2006 (Figure 4), similar to trends in the U.S. stock assessment estimates of age 1+ population biomass (Figure 2).

The abundance of sardine and the timing of their annual northward migration are influenced, in part, by stock size, age and size composition, recruitment relationships that are not well understood, and environmental factors (Lo et al. 2010, Hill et al. 2015, Nieto et al. 2015). Although cooler spring and summer ocean temperatures along migration corridors may contract northern migration in some years, low population sizes are believed to be an important contributing factor to the lack of sardine observed in the 2013 and 2014 WCVI surveys and with the B.C. fishery. Low levels of recruitment to the population in recent years appear to explain decreases in the population biomass and WCVI night trawl survey catch densities. One explanation for recent low juvenile recruitment is an increase in mesoscale ocean eddies near the California coast spawning grounds associated with (Nieto et al. 2015). Nieto et al. (2015) suggest that these eddies may transport Pacific Sardine eggs and larvae too far from shore for the young progeny to access nearshore foraging and rearing habitat for their continued survival.

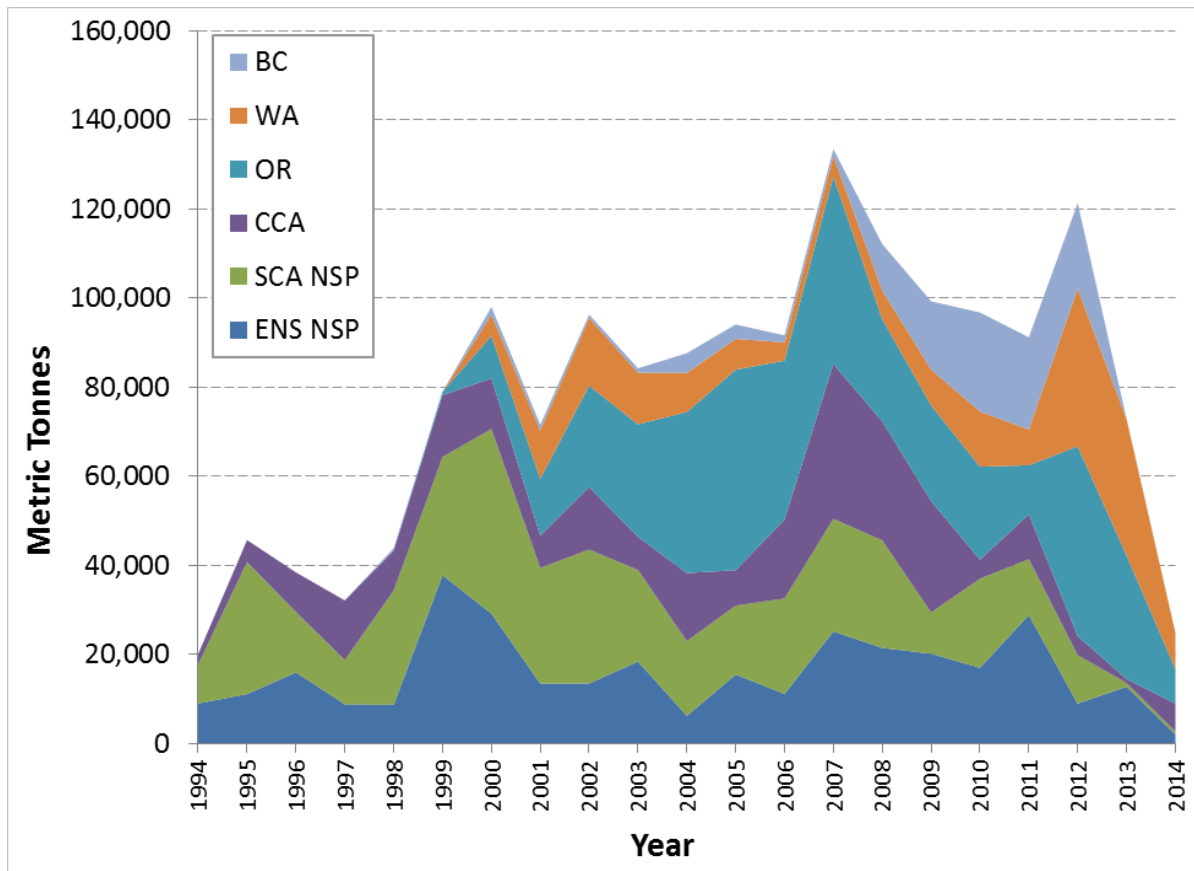


Figure 1: Sardine landings by fishing region and calendar year during 1994-2014 (from Hill et al. 2015). Legend: BC= British Columbia; WA= Washington state; OR= Oregon state; CCA = central California; SCA NSP = southern California northern subpopulation; ENS NSP = Ensenada northern subpopulation (Baja Mexico).

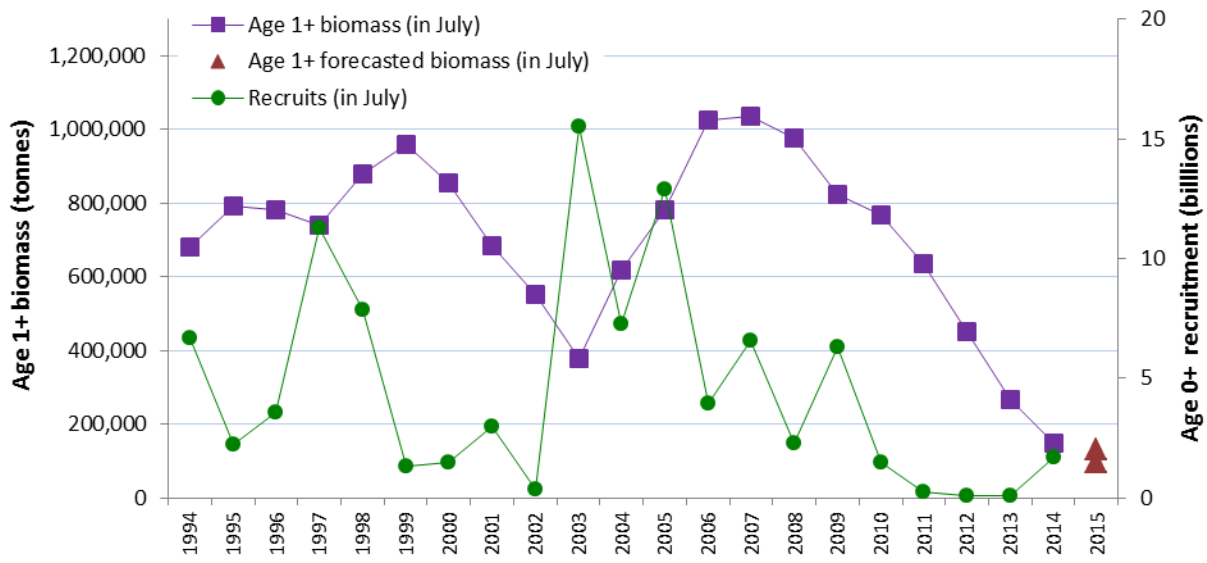


Figure 2: Estimates of sardine age 1 year and older (1+) biomass (tonnes) and year class strength of age 0 recruits (billions of fish) from a Stock Synthesis assessment of the Pacific Sardine northern subpopulation (Hill et al. 2015). Forecasts of age 1+ biomass for 2015 are shown from freely estimating recruitment (using a Beverton-Holt model, the higher of the two red triangles) and from using the average recruitment over 2011-2013 (the lower of the two red triangles).

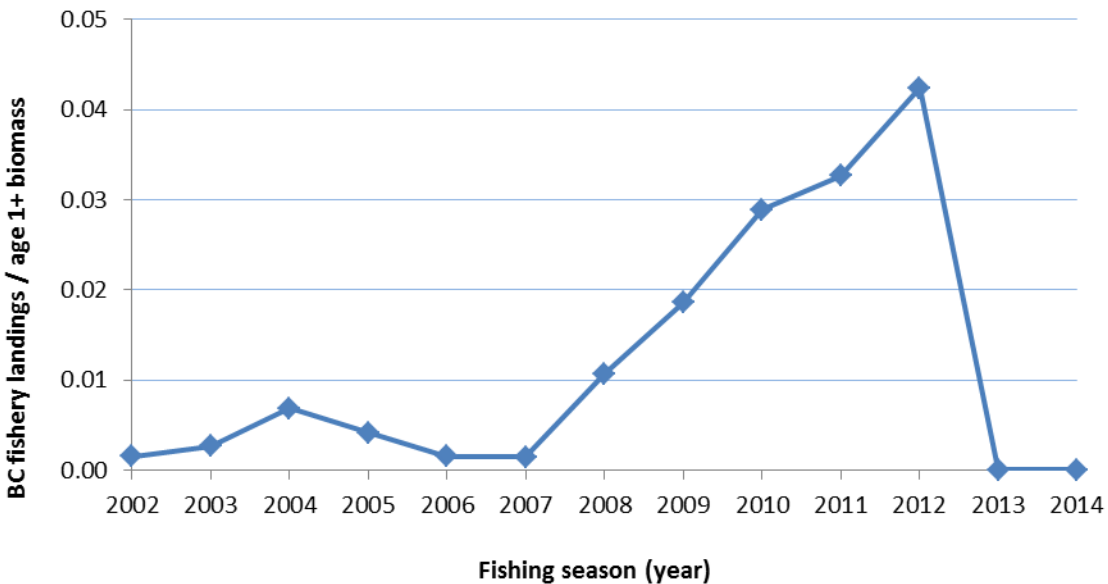


Figure 3: Estimates of the British Columbia landings-based sardine fishery age 1+ northern subpopulation exploitation rates (2002-2014).

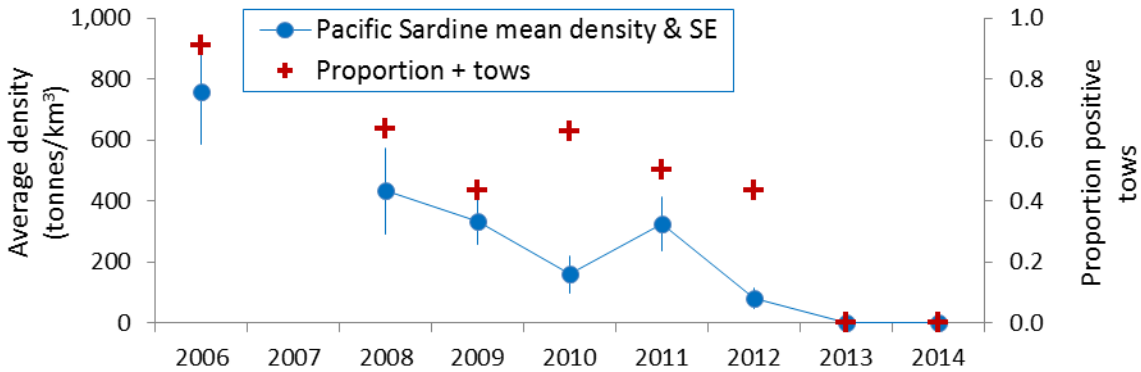


Figure 4. West coast of Vancouver Island summer night trawl survey average sardine density (tonnes/km³) and standard error (SE) and proportion of positive tows with sardine, 2006, 2008-2014.

References:

- Demer, D.A., Zwolinski, J.P. 2014. Corroboration and refinement of a method for differentiating landings from two stocks of Pacific sardine (*Sardinops sagax*) in the California Current. ICES Journal of Marine Science 71(2): 328-335.
- Flostrand, L., Schweigert, J., Detering, J., Boldt, J., and MacConnachie, S. 2011. Evaluation of Pacific Sardine stock assessment and harvest guidelines in British Columbia. DFO Can. Sci. Advis. Sec. Res. Doc. 2011/096. http://www.dfo-mpo.gc.ca/Csas-sccs/publications/resdocs-docrech/2011/2011_096-eng.pdf
- Hill, K.T., Crone, P., Lo, N.C.H., Demer, D.A., Zwolinski, J.P., and Macewicz, B.J. 2012. Assessment of the Pacific Sardine resource in 2012 for U.S. management in 2013. Pacific Fishery Management Council, Nov 2012 Briefing Book, Agenda Item 1.2.b.193p. http://www.pccouncil.org/wp-content/uploads/MAIN_DOC_G3b_ASSMNT_RPT2_WEB_ONLY_NOV2012BB.pdf
- Hill, K.T., Crone, P., Lo, N.C.H., Demer, D.A., Zwolinski, J.P., Dorval, E. and Macewicz, B.J. 2014. Assessment of the Pacific sardine resource in 2014 for U.S.A management in 2014-15. Pacific Fishery Management Council, April 2014 Briefing Book, Agenda Item H.1.b.
- Hill, K.T., Crone, P., Dorval, E. and Macewicz, B.J. 2015. Assessment of the Pacific sardine resource in 2015 for U.S.A management in 2015-16. Pacific Fishery Management Council, April 2015 Briefing Book, Agenda Item G.1.a.
- Félix-Uraga, R., V. M. Gómez-Muñoz, C. Quiñónez-Velázquez, F. Neri Melo-Barrera, and W. García-Franco. 2004. On the existence of Pacific sardine groups off the west coast of BajaCalifornia and Southern California. CalCOFI Rep. 45: 146-151.

- Felix-Uraga, R., V. M. Gómez-Muñoz, C. Quiñónez-Velázquez, F. Neri Melo-Barrera, K. T. Hilland W. García-Franco. 2005. Pacific sardine stock discrimination off the west coast of BajaCalifornia and southern California using otolith morphometry. *CalCOFI Rep.* 46: 113-121.
- García-Morales, R. Shirasago-German, B. Felix-Uraga, R. and Perez-Lezama, E.L. 2012. Conceptual models of Pacific sardine distribution in the California Current system. *Current Develop. Oceanogr.* 5(1): 23-47.
- Lo, N.C.H., Macewicz, B.J., and Griffiths, D. 2010. Biomass and reproduction of Pacific sardine (*Sardinops sagax*) off the Pacific northwestern United States 2003-2005. *Fishery Bulletin* 108: 174-192.
- Nieto, K., S. McClatchie, E. D. Weber, and C. E. Lennert-Cody (2014), Effect of mesoscale eddies and streamers on sardine spawning habitat and recruitment success off Southern and central California, *J. Geophys. Res. Oceans*, 119, 6330–6339, doi:10.1002/2014JC010251.
- Zwolinski, J. P., Emmett, R. L., and Demer, D. A. 2011. Predicting habitat to optimize sampling of Pacific sardine (*Sardinops sagax*). *ICES Journal of Marine Science*, 68: 867-879.

APPENDIX 3. ABORIGINAL FISHING PLAN

The Department is committed to a strong working relationship with Aboriginal people. Aboriginal fisheries play an important role in this relationship and, therefore, are an integral part of fisheries resource management in the Pacific Region. Through consultation, cooperative management and stewardship activities, DFO and Aboriginal groups are working together to build strong, healthy relationships and a sustainable fishery.

Through the Aboriginal Fisheries Strategy, the Department seeks to negotiate with Aboriginal organizations access for Food, Social, and Ceremonial (FSC) purposes. Subject to conservation, this access has priority over access for commercial and recreational harvest. FSC fisheries are managed through communal licences that are issued to First Nations organizations. The Department will consult with First Nations organizations to determine appropriate levels of access. In some cases, a portion of a PFMA may be closed to fishing except for fishing by a First Nation organization. These closures may be for the season or for specified times. Whenever possible, the appropriate annual fishing plan will identify such closures. It is possible that situations may arise in the implementation of the plan where in-season closure adjustments will be required to ensure access to the fishery by First Nations organizations for FSC purposes. There is no known FSC fishing for Pacific Sardine in the Pacific Region at this time.

In addition to fishing opportunities for FSC purposes (or domestic purposes for treaty bands), DFO acknowledges that in *Ahousaht Indian Band et al. v. Canada and British Columbia*, the courts have found that five Nuu-chah-nulth First Nations located on the west coast of Vancouver Island – Ahousaht, Ehattesaht, Hesquiaht, Mowachaht/Muchalaht, and Tla-o-qui-aht – have what the courts have characterized as “aboriginal rights to fish for any species of fish within their Fishing Territories and to sell that fish, with the exception of geoduck”.

The Department is working with the First Nations pursuant to the rights found by the courts, to find “the manner in which the plaintiffs’ rights can be accommodated and exercised without jeopardizing Canada’s legislative objectives and societal interests in regulating the fishery.” The outcome of these discussions could lead to in-season management changes. DFO will make every effort to advise stakeholders of any such changes in advance of them being implemented.

For additional information on DFO’s Treaty and Aboriginal Fisheries programs, please visit: <http://www.pac.dfo-mpo.gc.ca/abor-autoc/index-eng.htm>

APPENDIX 4. RECREATIONAL FISHING PLAN

The recreational harvest of various fish and invertebrate species in BC is regulated via the *British Columbia Sport Fishing Regulations, 1996* made under the *Fisheries Act*. A Fisheries and Oceans Canada Tidal Waters Sport Fishing licence is required for the recreational harvest of all species of fish.

The regulations for recreational fishing of finfish are summarized in the B.C. Tidal Waters Sport Fishing Guide which lists closed times, bag limits, size limits (where applicable) and closed areas. Recreational harvest for Pacific Sardine is permitted coast wide. The daily limit is 100 pieces and the possession limit is 200 pieces.

When required, Fishery Notices are issued to advise fishers of changes to this guide. For more information on the recreational fishery refer to the following web link:

<http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/>

The primary consultative body for the recreational fishing community is the Sport Fishing Advisory Board (SFAB). The SFAB has representatives from all parts of the community including the B.C. Wildlife Federation and the Sport Fishing Institute of B.C.. If you have any questions or need further information, please contact a recreational fisheries co-coordinator or a local Fisheries and Oceans Canada office (see Appendix 6).

APPENDIX 5. COMMERCIAL FISHING PLAN

Table of Contents

1.	COMMERCIAL FISHING PLAN	53
1.1.	TOTAL ALLOWABLE CATCH.....	53
2.	LICENSING	53
2.1.	ONLINE LICENSING	53
2.2.	LICENCE CATEGORY.....	54
2.3.	LICENCE APPLICATION FEES	54
2.4.	ACCESS AND LICENCE APPLICATION PROCESS FOR THE 2015 FISHERY	54
2.4.1.	COMMUNAL COMMERCIAL LICENCES (ZSF)	54
2.4.2.	COMMERCIAL LICENCES (ZS).....	54
3.	FISHING ACTIVITY.....	55
3.1.	SPECIES.....	55

1. COMMERCIAL FISHING PLAN

1.1. Total Allowable Catch

The July 2015 forecasted biomass estimate of age 1+ sardines from the U.S. stock assessment is 96,688 mt. The framework for setting allowable catch of sardine in Canada takes the U.S. age 1+ estimate from the previous year, subtracts a cut-off amount of 150,000 mt (which is consistent with the U.S. management practice), and applies a harvest rate of between 3 and 5%. Therefore, for the 2015 fishing season, the TAC is set at 0 mt because the estimated biomass is below the cut-off value.

The 2015 U.S. stock assessment is available at:

http://www.pcouncil.org/wp-content/uploads/2015/03/G1a_FullSardine_Assessment_E-ONLY_APR2015BB.pdf

2. LICENSING

2.1. Online Licensing

Commercial licence holders may process fee payments and access their 2015 sardine licence documents through their National Online Licensing System (NOLS) account. Commercial sardine licence holders will not be sent paper application forms for 2015 licence renewal. Instead licences are renewed by completing the applicable licence fee payment process in NOLS; however for 2015, as the sardine fishery is closed the fee is not applicable, and is set to \$0.00 (zero dollars), and there is no requirement to designate a vessel. Please note that the \$0.00 fee payment must still be processed in NOLS, which thereby maintains eligibility for the licence. Once licence fee payments are processed, an e-mail notification is sent to licence holders, who may then print licence documents from their NOLS account. Pacific Fishery Licence Unit (PFLU) contact details are shown below for any licensing inquiry.

Telephone: 1-877-535-7307 (ask for “Pacific Region”)
Fax: 604-666-5855
Email: fishing-peche@dfo-mpo.gc.ca (specify “Pacific Region” in subject line)
NOLS: Use the ‘Submit Request’ feature
Address: 200-401 Burrard St, Vancouver BC V6C 3S4 (by appointment only)

Beginning in 2013, the Department’s commercial licensing services moved from the counter to the internet to enable fishermen to go online to obtain and renew their commercial fishing licences – and to access other in-season services. Fishermen are now able to pay most licensing fees online using their bank card (Interac) or credit card. They will also use the online licensing system to request and receive their licence documents, and to access approval of representatives and issuance of licence conditions. Fishermen who prefer to pay licence fees using cash or cheque may still do so at any national bank; however, these fishermen will still require an email address and registration within the

Appendix 5

new system, so the Department can notify them when payments have been processed. Alternatively, fishermen may appoint a representative to handle their transactions via the online licensing system.

The NOLS is supported by a client support service, which has replaced the Department's traditional at the counter licensing services. Check our web page for updates: <http://www.dfo-mpo.gc.ca/fm-gp/sdc-cps/index-eng.htm> or call 1-877-535-7307.

2.2. Licence Category

A communal commercial Pacific Sardine licence, category ZSF, or a commercial Pacific Sardine, category ZS licence is required to commercially harvest Pacific Sardine. Pacific Sardine licences are party based licences.

2.3. Licence Application Fees

There is no fee for a communal commercial licence, category ZSF. Commercial licences, category ZS, fees are \$30. The \$30 ZS fee is waived for 2015 as the fishery is closed for conservation reasons. ZS licence holders will instead see a \$0.00 fee in their NOLS account.

2.4. Access and Licence Application Process for the 2015 Fishery

2.4.1. Communal Commercial Licences (ZSF)

Although there will be no sardine fishery in 2015, priority applicants must complete the online "payment" process for the \$0.00 fee, in order to maintain their priority status for communal commercial sardine licences. All priority applicants that met all the criteria in 2014, and for 2015 as described above, will continue to be eligible to apply on a priority basis in 2016, should a fishery take place.

The priority application process for the 25 communal commercial sardine licences was developed in consultation with DFO's Sardine Integrated Advisory Board (SIAB) which includes representatives from commercial and communal commercial participants as well as other stakeholders. Please see Section 4.4 of the main body of the IFMP for more information on past communal commercial licence application processes.

2.4.2. Commercial Licences (ZS)

There are 25 commercial Pacific Sardine licences. All commercial sardine licence holders must renew their licence prior to February 9, 2016, by completing the NOLS payment process for the \$0.00 fee, in order to maintain their ongoing eligibility.

Please see section 1.5.1 of the main body of the IFMP for more information on the history of the licence limitation process for commercial licences.

3. FISHING ACTIVITY

3.1. Species

There is no authorized catch of Pacific Sardine (*Sardinops sagax*), Chub mackerel (*Scomber japonicus*), or Jack mackerel (*Trachurus symmetricus*) permitted in 2015.

APPENDIX 6. CONTACTS

Fisheries and Oceans Canada (Pacific Region)

Website: <http://www.pac.dfo-mpo.gc.ca/index-eng.htm>

Commercial Information	604-666-2828
Commercial Information (toll free)	1-866-431-3474
Observe, Record and Report (Enforcement Line)	1-800-465-4336

Fisheries Management Branch

Website: <http://www.pac.dfo-mpo.gc.ca/fm-gp/commercial/pelagic-pelagique/tuna-thon/index-eng.htm>

A/Regional Pelagics Coordinator Suite 200 - 401 Burrard Street Vancouver, B.C. V6C 3S4	Corey Jackson	(604) 666-3637
--	---------------	----------------

Sardine Resource Manager Suite 200 - 401 Burrard Street Vancouver, B.C. V6C 3S4	Courtney Druce Fax	(604) 666-2188 (604) 666-9136
---	-----------------------	----------------------------------

North Coast Resource Management Areas 1 to 10 417 2nd Avenue West Prince Rupert, BC V8J 1G8	Sandra Davies	(250) 627-3007
--	---------------	----------------

South Coast Resource Management Areas 11 to 26 3225 Stephenson Point Road Nanaimo, BC V9T 1K3	Vacant	(250) 756-7103
--	--------	----------------

Science Branch

Website: <http://www.dfo-mpo.gc.ca/science/index-eng.htm>

Sardine Research Biologist Pacific Biological Station Hammond Bay Road Nanaimo, B.C. V9T 6N7	Linnea Flostrand	(250) 756-7187
---	------------------	----------------

Recreational Fisheries

Website: <http://www.pac.dfo-mpo.gc.ca/fm-gp/rec/index-eng.htm>

Recreational Fisheries Coordinator	Devona Adams	(604) 666-3271
------------------------------------	--------------	----------------

Treaty and Aboriginal Policy Directorate

Website: <http://www.pac.dfo-mpo.gc.ca/abor-autoc/index-eng.html>

Regional Director Sarah Murdoch (604) 666-7478

Oceans and Habitat

Senior MPA Program Manager Kate Ladell (604) 666-1089

Enforcement Officers Conservation and Protection

Conservation and Protection Supervisor Jim Robson (250) 720-4450

Pacific Fisheries Licensing Units

Website: <http://www.pac.dfo-mpo.gc.ca/fm-gp/licence-permis/index-eng.htm>

Phone 1-877-535-7307

Email fishing-peche@dfo-mpo.gc.ca

Fisheries and Oceans Canada – Pacific Sardine Consultations:

<http://www.pac.dfo-mpo.gc.ca/consultation/fisheries-peche/pelag/sardine/index-eng.htm>

APPENDIX 7. SAFETY AT SEA

TABLE OF CONTENTS

1. OVERVIEW – FISHING VESSEL SAFETY	56
2. IMPORTANT PRIORITIES FOR VESSEL SAFETY	57
2.1 Fishing Vessel Stability	57
2.2 Emergency Drill Requirements	58
2.3 Cold Water Immersion.....	58
2.4 Other Issues	59
2.4.1 Weather	59
2.4.2 Emergency Radio Procedures	59
2.4.3 Collision Regulations.....	59
2.4.4 Buddy System	60
3. WORKSAFEBBC.....	60
4. FISH SAFE BC.....	61
5. TRANSPORTATION SAFETY BOARD.....	62

1. OVERVIEW – FISHING VESSEL SAFETY

Vessel owners and masters have a duty to ensure the safety of their crew and vessel. Adherence to safety regulations and good practices by owners, masters and crew of fishing vessels will help save lives, prevent vessel damage and protect the environment. All fishing vessels must be in a seaworthy condition and maintained as required by Transport Canada (TC), WorkSafeBC, and other applicable agencies. Vessels subject to inspection should ensure that the certificate of inspection is valid for the area of intended operation.

In the federal government, responsibility for shipping, navigation, and vessel safety regulations and inspections lies with Transport Canada (TC); emergency response with the Canadian Coast Guard (CCG) and DFO has responsibility for management of the fisheries resources. In B.C., WorkSafeBC also regulates health and safety issues in commercial fishing. This includes requirements to ensure the health and safety of the crew and safe operation of the vessel. DFO (Fisheries and Aquaculture Management (FAM) and CCG) and TC through an MOU have formalized cooperation to establish, maintain and promote a safety culture within the fishing industry.

Before departing on a voyage the owner, master or operator must ensure that the fishing vessel is capable of and safe for the intended voyage and fishing operations. Critical factors for a safe voyage include the seaworthiness of the vessel, vessel stability, having the required personal protective and life-saving equipment in good working order, crew training, and knowledge of current and forecasted weather conditions. As safety requirements and guidelines may change, the vessel owner, crew, and other workers must be aware of the latest legislation, policies and guidelines prior to each trip.

There are many useful tools available for ensuring a safe voyage. These include:

Education and Training Programs

Marine Emergency Duties

Fish Safe – Stability Education Course

Fish Safe – Safe on the Wheel Course

Fish Safe – Safest Catch Program

First Aid

Radio Operators Course

Fishing Masters Certificates

Small Vessel Operators Certificate

Publications:

- Transport Canada Publication TP 10038 *Small Fishing Vessel Safety Manual* (can be obtained at Transport Canada Offices from their website at: <http://www.tc.gc.ca/eng/marinesafety/tp-tp10038-menu-548.htm>)
- Gearing Up for Safety – WorkSafeBC
- Safe At Sea DVD Series – Fish Safe
- Stability Handbook – Safe at Sea and Safest Catch – DVD Series
- Safest Catch Log Book
- Safety Quik

For further information see: www.tc.gc.ca/eng/marinesafety/menu.htm
www.fishsafebc.com

2. IMPORTANT PRIORITIES FOR VESSEL SAFETY

There are three areas of fishing vessel safety that should be considered a priority. These are: vessel stability, emergency drills, and cold water immersion.

2.1 Fishing Vessel Stability

Vessel stability is paramount for safety. Care must be given to the stowage and securing of all cargo, skiffs, equipment, fuel containers and supplies, and also to correct ballasting. Fish harvesters must be familiar with their vessel's centre of gravity, the effect of liquid free surfaces on stability, loose water or fish on deck, loading and unloading operations and the vessel's freeboard. Know the limitations of your vessel; if you are unsure contact a reputable naval architect, marine surveyor or the local Transport Canada Marine Safety Office.

Fishing vessel owners are required to develop detailed instructions addressing the limits of stability for each of their vessels. The instructions need to be based on a formal assessment of the vessel by a qualified naval architect and include detailed safe operation documentation kept on board the vessel. Examples of detailed documentation include engine room procedures, maintenance schedules to ensure watertight integrity, and instructions for regular practice of emergency drills.

The *Small Fishing Vessel Inspection Regulations* currently require, with certain exceptions, a full stability assessment for vessels between 15 and 150 gross tons that do not exceed 24.4 metres in length and are used in the herring or capelin fisheries. Once the proposed new *Fishing Vessel Safety Regulations* take effect, more vessels will be required to have a stability booklet.

In 2006, Transport Canada Marine Safety (TC) issued [Ship Safety Bulletin \(SSB\) 04/2006](#) ("Safety of Small Fishing Vessels: Information to Owners/Masters About Stability Booklets"), which provides a standard interpretation of the discretionary power available under Section 48 and the interim requirements prior to the implementation of the proposed *Fishing Vessel Safety Regulations*. The bulletin calls for vessels more than 15 gross tons to have a stability booklet where risk factors that negatively affect stability are present. The bulletin also suggests vessels less than 15 gross tons assess their risk factors. Every fishing vessel above 15 GRT built or converted to herring or capelin after 06 July 1977 and engaged in fishing herring or capelin must have an approved stability book. Additionally Transport Canada has published a Stability Questionnaire (SSB 04/2006), and Fishing Vessel Modifications Form which enable operators to identify the criteria which will trigger a stability assessment. A stability assessment is achieved by means of an inclining experiment, which has to be conducted by a naval architect. Please contact the nearest Transport Canada office if you need to determine whether your vessel requires one.

In 2008, TC issued [SSB 01/2008](#), which sets out a voluntary record of modifications for the benefit of owners/masters of any fishing vessels. For vessels of more than 15 gross tons, the record of modifications was to be reviewed by TC inspectors during regular inspections and entered on the vessel's inspection record. However, information gathered during the Transportation Safety Board's (TSB) Safety Issues Investigation into the fishing industry showed minimal recording of vessel modifications prior to this date.

The TSB has investigated several fishing vessel accidents since 2002 and found that vessel modifications and loading of traps have been identified as contributing factors in vessel capsizings, such as: [M02W0102](#) - *Fritzi-Ann*, [M05W0110](#) - *Morning Sunrise*, [M07M0088](#) - *Big Sisters*, [M08W0189](#) - *Love and Anarchy*, [M09L0074](#) – *Le Marsouin I*, [M10M0014](#) - *Craig and Justin*, [M12W0054](#) – *Jessie G* and [M12W0062](#) - *Pacific Siren*.

Vessel masters are advised to carefully consider stability when transporting gear. Care must be given to the stowage and securing of all traps, cargo, skiffs, equipment, fuel containers, and supplies, and also to correct ballasting. Know the limitations of your vessel; if you are unsure contact a reputable marine surveyor, naval architect or the local Transport Canada Marine Safety office.

In 2013, Fish Safe developed a code of best practices for the food and bait herring fishery and the prawn fishery: ‘Food and Bait – Best Practice Reminders’; ‘Prawn Industry - Best Industry Recommended Practices.’ Please contact Gina McKay at Fish Safe for a copy of the program materials they developed to address safety and vessel stability in these fisheries. Gina McKay - Phone: 604-261-9700 - Email: fishsafe@fishsafebc.com

2.2 Emergency Drill Requirements

The Canada Shipping Act 2001 requires that the Authorized Representative of a Canadian Vessel shall develop procedures for the safe operation of the vessel and for dealing with emergencies. The Act also requires that crew and passengers receive safety training. The Marine Personnel Regulations require that all personnel on board required to meet the minimum safe manning levels have received MED (Marine Emergency Duties) training to an A1 or A3 level, depending on the vessel’s voyage limits, within 6 months of serving aboard. MED A3 training is 8 hours in duration and is applicable to seafarers on fishing vessels less than 150 GRT that are within 25 miles from shore (NC2). MED A1 training is 19.5 hours duration and is applicable to all other fishing vessels.

MED provides a basic understanding of the hazards associated with the marine environment; the prevention of shipboard incidents; raising and reacting to alarms; fire and abandonment situations; and the skills necessary for survival and rescue.

2.3 Cold Water Immersion

Drowning is the number one cause of death in B.C.’s fishing industry. Cold water is defined as water below 25 degrees Celsius, but the greatest effects occur below 15 degrees. BC waters are usually below 15 degrees. Normal body temperature is around 37 degrees Celsius; cold water rapidly draws heat away from the body. The effects of cold water on the body occur in four stages: cold shock, swimming failure, hypothermia and post-rescue collapse. Know what to do to prevent you or your crew from falling into the water and what to do if that occurs. More information is available in the WorkSafe Bulletin *Cold Water Immersion* (available from the WorkSafeBC website at www.worksafebc.com), where the need to don PFD’s while working in or near the water during fishing operations is clearly emphasized.

2.4 Other Issues

2.4.1 Weather

Vessel owners and masters are reminded of the importance of paying close attention to current weather trends and forecasts during the voyage. Marine weather information and forecasts can be obtained on VHF channels 21B, Wx1, Wx2, Wx3, or Wx4. Weather information is also available from Environment Canada website at:

http://www.weatheroffice.gc.ca/marine/index_e.html

2.4.2 Emergency Radio Procedures

Vessel owners and masters should ensure that all crew are able to activate the Search and Rescue (SAR) system early rather than later by contacting the Canadian Coast Guard (CCG). It is strongly recommended that all fish harvesters carry a registered 406 MHz Emergency Position Indicating Radio Beacon (EPIRB). These beacons should be registered with the National Search and Rescue secretariat. When activated, an EPIRB transmits a distress call that is picked up or relayed by satellites and transmitted via land earth stations to the Joint Rescue Co-ordination Centre (JRCC), which will task and co-ordinate rescue resources.

Fish harvesters should monitor VHF channel 16 or MF 2182 KHz and make themselves and their crews familiar with other radio frequencies. All crew should know how to make a distress call and should obtain their restricted operator certificate from Industry Canada. However, whenever possible, masters should contact the nearest Canadian Coast Guard (CCG) Marine Communications and Traffic Services (MCTS) station (on VHF channel 16 or MF 2182 kHz) prior to a distress situation developing. Correct radio procedures are important for communications in an emergency. Incorrect or misunderstood communications may hinder a rescue response.

Since August 1, 2003 all commercial vessels greater than 20 metres in length are required to carry a Class D VHF Digital Selective Calling (DSC) radio. A registered DSC VHF radio has the capability to alert other DSC equipped vessels in your immediate area and MCTS that your vessel is in distress. Masters should be aware that they should register their DSC radios with Industry Canada to obtain a Marine Mobile Services Identity (MMSI) number or the automatic distress calling feature of the radio may not work. For further information see the Coast Guard website at: www.ccg-gcc.gc.ca/e0003901 or go directly to the Industry Canada web page: www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01032.html.

A DSC radio that is connected to a GPS unit will also automatically include your vessel's current position in the distress message. More detailed information on MCTS and DSC can be obtained by contacting a local Coast Guard MCTS centre (located in Vancouver, Victoria, Prince Rupert, Comox and Tofino) or from the Coast Guard website: www.ccg-gcc.gc.ca/Pacific.

2.4.3 Collision Regulations

Fish harvesters must be knowledgeable of the *Collision Regulations* and the responsibilities between vessels where risk of collision exists. Navigation lights must be kept in good working order and must be displayed from sunset to sunrise and during all times of restricted visibility. To help reduce the potential for collision or close quarters situations which may also result in the loss of fishing gear, fish harvesters are encouraged to monitor the appropriate local Vessel Traffic Services (VTS) VHF channel, when travelling or fishing near shipping lanes or other areas frequented by large commercial vessels. Vessels required to participate in VTS include:

- a) every ship twenty metres or more in length,
- b) every ship engaged in towing or pushing any vessel or object, other than fishing gear,
- c) where the combined length of the ship and any vessel or object towed or pushed by the ship is forty five metres or more in length; or
- d) where the length of the vessel or object being towed or pushed by the ship is twenty metres or more in length.

Exceptions include:

- a) a ship towing or pushing inside a log booming ground,
- b) a pleasure yacht *less than* 30 metres in length, and
- c) a fishing vessel that is *less than* 24 metres in length and not *more than* 150 tons gross.

More detailed information on VTS can be obtained by calling (250) 363 8904 or from the Coast Guard website: <http://www.ccg-gcc.gc.ca/e0003901>.

2.4.4 Buddy System

Fish harvesters are encouraged to use the buddy system when transiting, and fishing as this allows for the ability to provide mutual aid. An important trip consideration is the use of a sail plan which includes the particulars of the vessel, crew and voyage. The sail plan should be left with a responsible person on shore or filed with the local MCTS. After leaving port the fish harvester should contact the holder of the sail plan daily or as per another schedule. The sail plan should ensure notification to JRCC when communication is not maintained which might indicate your vessel is in distress. Be sure to cancel the sail plan upon completion of the voyage.

3. WORKSAFEBBC

Commercial fishing is legislated by the requirements of the Workers Compensation Act (WCA) and for diving, fishing and other marine operations Part 24 of the Occupational Health and Safety Regulation (OHSR) applies. Many general hazard sections of the OHSR also apply to commercial fishing and other marine operations. For example, Part 8: Personal Protective Clothing and Equipment addresses issues related to safety headgear, safety foot wear and personal floatation devices. Part 15 addresses issues on rigging, Part 5 addresses issues of exposure to chemical and biological substances, and Part 3 addresses training of young and new workers, first aid, and accident investigations. Part 3 of the WCA also defines the roles and responsibilities of owners, employers, supervisors and workers. The OHSR and the WCA are

available from the Provincial Crown Printers or by visiting the WorkSafeBC website:
www.worksafebc.com

For further information, contact an Occupational Safety Officer:

Bruce Logan	Lower Mainland	(604) 244-6477
Wayne Tracey	Lower Mainland	(604) 232-1960
Pat Olsen	Courtenay	(250) 334-8777
Mark Lunny	Courtenay	(250) 334-8732
Jessie Kuncce	Victoria	(250) 881-3461

or the Manager of Interest for Marine and Fishing, Mike Ross (250) 881-3419.

For information on projects related to commercial fishing contact Ellen Hanson (604) 233-4008 or Toll Free 1-888-621-7233 ext. 4008 or by email: Ellen.Hanson@worksafebc.com.

4. FISH SAFE BC

Fish Safe encourages Vessel masters and crew to take ownership of fishing vessel safety. Through this industry driven and funded program Fish Safe provides fishing relevant tools and programs to assist fishermen in this goal. The Fish Safe Stability Education Course, is available to all fishermen who want to improve their understanding of stability and find practical application to their vessel's operation. The Safe on the Wheel Course is designed to equip crewmen with the skills they need to safely navigate during their wheel watch. The Safest Catch Program along with fishermen trained Safety Advisors is designed to give fishermen the tools they need to create a vessel specific safety management system.

Fish Safe is managed by Gina McKay, Project Coordinator John Krgovich, Program Assistant, Connor Radil, and fishermen Safety Advisors. All activities and program development is directed by the Fish Safe Advisory Committee (membership is open to all interested in improving safety on board). The advisory committee meets quarterly to discuss safety issues and give direction to Fish Safe in the development of education and tools for fish harvesters.

Fish Safe also works closely with WorkSafeBC to improve the fishing injury claims process. For further information, contact:

Gina McKay	Phone: 604-261-9700
Program Manager	Cell: 604-339-3969
Fish Safe	Fax: 604-275-7140
#100, 12051 Horseshoe Way	Email: fishsafe@fishsafebc.com
Richmond, BC V7A 4V4	www.fishsafebc.com

5. TRANSPORTATION SAFETY BOARD

The Transportation Safety Board (TSB) is not a regulatory board. The TSB is an independent agency that investigates marine, pipeline, railway and aviation transportation occurrences to determine the underlying risks and contributing factors. Its sole aim is the advancement of

transportation safety by reporting publicly through Accident Investigation Reports or Marine Safety Information Letters or Advisors. It is not the function of the Board to assign fault or determine civil or criminal liability. Under the TSB Act all information collected during an investigation is completely confidential.

In 2012, the TSB released the results of a three-year investigation into fishing safety in Canada. This report identifies 10 key factors and makes several suggestions to address the problems that persist throughout the industry. In 2013 the TSB released investigation reports on two prawn fishing vessels the Jessie G and the Pacific Siren. In 2014 the TSB released the investigation report on the collision between fishing vessel Viking Storm and U.S. fishing vessel Maverick.

For more information about the TSB, visit it's website at www.tsb.gc.ca. For information about the TSB's investigation into fishing safety, or to view a brief video, visit <http://www.tsb.gc.ca/eng/medias-media/videos/marine/m09z0001/index.asp>.

To view a brief video about some of the issues on the TSB's recent safety Watchlist, visit: <http://www.tsb.gc.ca/eng/medias-media/photos/index.asp>.

Reporting an Occurrence - www.tsb.gc.ca/eng/incidents-occurrence/marine/

After a reportable occurrence happens you can fill out the TSB 1808 Form or call the TSB at the contact information below.

Glenn Budden, Investigator, Marine - Fishing Vessels
Transportation Safety Board of Canada
4 - 3071 No. 5 Road
Richmond, BC, V6X 2T4
Telephone: 604-666-2712
Cell: 604-619-6090
Email: glenn.budden@tsb.gc.ca

APPENDIX 8. SAMPLE LOGBOOK PAGE

HAIL VERIFICATION # : Call: 1-800-775-5505 VESSEL INFORMATION (to be completed by Vessel Master) VESSEL NAME: _____ VRN: _____ TAB #: ZS / ZSF: _____ (circle one) DAYS FISHED: _____ SPLIT LOAD: YES / NO _____ VESSEL MASTER NAME: _____ VESSEL MASTER FIN: _____ BUYER NAME: _____ (Fisher Identification Number) SPLIT LOG #S 1) _____ 2) _____		<div style="border: 2px solid black; padding: 5px; display: inline-block;"> SARDINE HARVEST LOGBOOK </div>	LOGPAGE ID #: _____ SPLIT BY: BUYER / TAB / OFFLOAD FACILITY (circle all that apply)													
HARVEST INFORMATION (to be completed by Vessel Master) ADDITIONAL SETS CAN BE RECORDED ON THE NEXT HARVEST LOG PAGE																
Section 'B'	SET #	SET DATE <small>(July 23/07)</small>	SET TIME <small>(24 hr clock)</small>	STAT AREA	SUB AREA	HARVEST LOCATION <small>(name of nearest landmark)</small>	LATITUDE 00° 00.000' <small>(degree decimal minutes)</small>	LONGITUDE 000° 00.000' <small>(degree decimal minutes)</small>	EST. TOTAL CATCH <small>(MT)</small>	EST. RETAINED <small>(MT)</small>	EST. SHARED <small>(MT)</small> <small>circle "To" or "From"</small>	OTHER VESSEL LOG ID #	OTHER VESSEL SET #	EST. RELEASED <small>(Including Mortality) (MT)</small>	EST. MORTALITY <small>(MT)</small>	REASON FOR RELEASE
	1										To From					
	2										To From					
	3										To From					
	4										To From					
	5										To From					
BY-CATCH INFORMATION (to be completed by Vessel Master) ADDITIONAL BY-CATCH CAN BE RECORDED ON THE NEXT HARVEST LOG PAGE REASON FOR RELEASE CODES: 1 = weather; 2 = gear issues; 3 = marine mammals; 4 = catch size; 5 = other																
Section 'C'	SET #	SPECIES NAME	# of PIECES	Est. TOTAL Wt. <small>(Metric - kg)</small>	CONDITION <small>(circle one)</small>			FISHER COMMENTS:								
					GOOD	POOR	DEAD									
					GOOD	POOR	DEAD									
					GOOD	POOR	DEAD									
					GOOD	POOR	DEAD									
					GOOD	POOR	DEAD									
OBSERVER SECTION																
AT-SEA OBSERVER NAME: _____		EMBARC DATE: _____		TIME: _____	DIS-EMBARC DATE: _____		TIME: _____	LENGTH SAMPLE Y/N	SET # 1 2 3 4 5							
DOCKSIDE OBSERVER NAME: _____				VALIDATION DATE: _____		START TIME: _____ <small>0000 hr clock</small>		FINISH TIME: _____		SIT. REP. # _____						
LANDING PORT: _____			OFFLOAD FACILITY: _____			DOCKSIDE BY-CATCH YES / NO _____		BUCKET SAMPLE YES NO _____		LOCATION STORED _____						
MACKEREL LANDING INFORMATION SARDINE LANDING INFORMATION																
NET WEIGHT (lb.)		CONVERSION FACTOR	P.R.Q. (KG)	OVERAGE AMOUNT (KG)		NET WEIGHT (pounds)		CONVERSION FACTOR	PREVIOUS R.Q. (KG)							
		x 0.4536 =	NET DOCK Wt. (kg)	OVERAGE TRANSFER TO / FROM				x 0.4536 =	NET DOCK WT. (KG)							
# TOTES			N.R.Q. (KG)	OTHER LOG ID #					NEW R.Q. (kg)							
COMMENTS: _____														# TOTES		



Fisheries and Oceans
Canada

Pêches et Océans
Canada

WHITE COPY ~ Observer YELLOW COPY ~ Buyer PINK COPY ~ Remains in Logbook

Revision Date: May 2012

D&D Pacific Fisheries Limited



APPENDIX 9. SARDINE INTEGRATED ADVISORY BOARD REPRESENTATIVES

Advisor Name	Representation	Contact
Courtney Druce	DFO – Fisheries Management (Chair)	courtney.druce@dfo-mpo.gc.ca
Linnea Flostrand	DFO – Science	linnea.flostrand@dfo-mpo.gc.ca
Jim Robson	DFO – Conservation and Protection	jim.robson@dfo-mpo.gc.ca
Bob Charlie	Communal Commercial	bcharlie@island.net
Charlie Cootes Sr.	Communal Commercial	charlie.cootes@uchucklesaht.ca
Roy Alexander	Communal Commercial	bcseafood@hotmail.com
Marion Campbell	Communal Commercial	ahoufc@gmail.com
Noah Plonka	Communal Commercial	noahp@toquaht.ca
Bill Wilson	Commercial	bwilson@dcnet.com
Mitch Ponak	Commercial	kanopfish@shaw.ca
John Lenic	Commercial	jalenic@telus.net
Brent Melan	Commercial	melbro@shaw.ca
Bill Bird	Commercial	quadrabirds@gmail.com
Chris Wick	Processor/Buyer Representative	chris@ndseafoods.com
Terry Keuber	Processor/Buyer Representative	scarlet@cablerocket.com
Mickey Flanagan	Processor/Buyer Representative	mickey@kelticseafoods.com
Mike Kelly	Sport Fishing Advisory Board	info@tidesandtales.com
Scott Wallace	Marine Conservation Council	swallace@davidsuzuki.ca
Dennis Chalmers	Province of BC	dennis.chalmers@gov.bc.ca

APPENDIX 10. SARDINE FISHERY CLOSURES FOR AREAS 23 – 27

Because there will be no fishery for sardine in 2015, the Time/Area Closures (Seasonal), Salmon Migration Corridor, and River Mouth Closures (Year Round) are not included in this Appendix.

However, should a sardine fishery be permitted in the future, this Appendix will be amended to include all applicable closures for the sardine fishery.

APPENDIX 11. SALMON BYCATCH AND DISCARD MANAGEMENT FRAMEWORK

1. INTRODUCTION

An audit on the sardine monitoring program was conducted in the summer of 2011 by DFO Resource Management and Science. It was determined that reporting of the sardine fleet for target and non-target catch was considered to be accurate and compliant. Increasing encounters with WCVI Chinook salmon led to the creation of this precautionary salmon bycatch management framework, which was created by DFO with input and approval from the Sardine Integrated Advisory Board.

2. OVERVIEW OF WCVI SALMON POPULATIONS:

Salmon are vulnerable to interception in the WCVI sardine fishery as the peak sardine fishing period generally occurs in the same areas and during the same times as the migration of salmon in the WCVI.

Although WCVI wild chinook populations are of greatest concern, impacts on other WCVI salmon populations should also be minimized as interceptions of depleted populations may result in relatively high additional mortality. For example, interceptions of as low as 10 to 20 fish can result in 10 to 20% additional mortality if they result from a single, depleted stock.

Based on the migration and escapement timing of WCVI salmon stocks, the period from July 1 to November 30 is identified as the time when these populations are vulnerable to harvest in WCVI fisheries.

- Northern WCVI chinook populations (i.e. those originating from Area 25 to 27) return to terminal inlets starting early July. The more southerly WCVI chinook populations (i.e. those originating from Area 24 south) return starting early August. Peak escapement of chinook to WCVI rivers is early October.
- The timing of other WCVI salmon populations varies. Sockeye tend to return to terminal areas starting in late May with peak escapement in July through August. Coho and chum return starting about August with peak escapement in late October through early November.

The areas where WCVI salmon stocks are vulnerable to harvest include:

- Terminal areas defined as those WCVI areas inside the surf-line (i.e. Areas 23, 24, 25, 26 and 27). Within the terminal areas, fishing areas either adjacent to salmon bearing rivers or other staging areas where salmon may be vulnerable (e.g. narrow, restricted inlets on a migration route) are of particular concern.
- Off-shore areas 1-mile seaward off the surf-line from early July through September where WCVI chinook migrate.

3. MANAGEMENT OBJECTIVES

- The objective of this salmon bycatch management plan is to adopt measures to minimize the catch and discards of WCVI wild origin salmon, which includes to the extent practicable, the development and use of selective, environmentally safe and cost effective fishing gear and techniques.

4. MANAGEMENT MEASURES

a) Avoidance (time and area fishing closures):

The primary strategy to reduce bycatch and discards of WCVI origin salmon in sardine fisheries is through the use of time and area fishing closures. Key areas and time periods of concern are identified in Table 6.

These general principles are applied to identify permissible fishing areas and set tolerance limits for salmon bycatch/discard rates for those periods when local salmon are vulnerable:

- Eliminate harvest near salmon bearing streams;
- Eliminate harvest along the migration corridor (1-mile from the surfline seaward) from July to September.
- Eliminate harvest in those areas where seine gear may be particularly efficient (i.e. a narrow, restricted inlet on a migration route) and where local salmon are known to migrate and/or stage (i.e. within 1 mile seaward of the surf-line).
- Eliminate harvest opportunities for Areas 24 (from August 1 – October 31) and 26 (from July 15 to October 15) during the period of chinook migration. Zero tolerance for chinook bycatch/discards within these areas during these vulnerable periods.
- Design harvest opportunities for sardine within mixed-salmon stock areas where individual salmon populations are less vulnerable (e.g. the approach, not staging areas of inlets).
- Allow more tolerance for bycatch/discards in either the mixed stock fishing areas of Areas 23 or 25 where hatchery surpluses exist or in off-shore areas where mixed stocks are prevalent.

Table 6: Risk to wild salmon populations by PFMA and fishing period

LOCATION	STATISTICAL AREA	FISHING PERIOD									
		JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	
Inshore	23	Low	Med	Med	High	Med	Med	Low	Low	Low	
	24	Low	Med	High	High	High	Med	Low	Low	Low	
	25	Low	Med	Med	High	Med	Med	Low	Low	Low	
	26	Low	High	High	High	High	Med	Low	Low	Low	
	27	Low	Med	Med	High	Med	Med	Low	Low	Low	
1-mile seaward of surfine	123	Low	Low	Med	Med	Low	Low	Low	Low	Low	
	124	Low	Low	Med	Med	Low	Low	Low	Low	Low	
	125	Low	Med	Med	Med	Low	Low	Low	Low	Low	
Offshore	123	Low	Low	Low	Low	Low	Low	Low	Low	Low	
	124	Low	Low	Low	Low	Low	Low	Low	Low	Low	
	125	Low	Low	Low	Low	Low	Low	Low	Low	Low	

b) Reduce Mortality (improve selectivity of fishing gear)

While many sardine seine vessels already have excluder systems installed, starting in 2012 all vessels will be required to install and maintain an excluder device. The implementation of an excluder device aims to eliminate the retention of salmon bycatch and maximize the potential for post-release survival.

Since there are many different variations of pumping/de-watering systems among the sardine fleet, excluder designs may vary from vessel to vessel. The sardine Conditions of Licence will provide the detailed requirements for any excluder devices, but flexibility will be a consideration when determining any specifications.

The excluder must be “manned”, where a crew member must monitor the excluder device and remove bycatch from the excluder in a manner which maximizes the potential for post-release survival. The excluder device must be within the pumping/de-watering system (i.e. fish must be excluded at some point after pumping and before going into the hold).

Prior to the start of the season, each vessel will have to demonstrate their excluder device to the industry selected service provider. Each vessel's excluder device will be documented by the service provider as part of the sardine annual report for post-season analysis.

c) At-sea Observers

The sardine fishery utilizes at-sea observers to: monitor fishing activities in adherence with Conditions of Licence; collect timely information on catch and effort levels by estimating weights of species caught and recording bycatch and condition of releases; estimate mortality; collect samples for biological purposes (i.e. length frequency information); and, record set information on location, date, time etc. In particular, at-sea observers are used in the WCVI to ensure accurate recording of salmon encounters and to ensure compliance with time and area closures.

From 2008 to 2011, WCVI Areas 23-27 required 100% at-sea observer coverage from July 15-October 1 (the period of high concern for returning wild salmon). It was determined after the monitoring program audit that it would be appropriate to lower the level of coverage along the WCVI when sufficient bycatch mitigation management measures were implemented.

Starting in 2012, a minimum level of 25% at-sea observer coverage will be implemented from July 15 – October 1 in WCVI Areas 23-27. Observer coverage levels during this time will be increased to mitigate salmon bycatch risks under the following circumstances:

- Increased levels of salmon encounters in an Area/Subarea (daily reports of all WCVI salmon bycatch, with a focus on Chinook, will be sent to the Resource Manager during periods of concern).
- Vessels suspected to be in non-compliance with Conditions of Licence (i.e. fishing contrary to time/area closures) based on reports from the service provider, C&P, Fisheries Management, or elsewhere.

Vessels that employ a Vessel Monitoring System (VMS) will be monitored by the service provider for compliance with time/area closures. Time/area closures mitigate the risks of encountering returning wild salmon stocks while VMS monitors compliance with these closures. Vessels using VMS will not be subject to increased observer levels beyond the 25% level, regardless of time or area fished. This is subject to change if a vessel is suspected to be inaccurately reporting bycatch data.

For all other areas (i.e. outside areas and WCVI areas during periods of low concern), the at-sea observer coverage level will aim to meet the 25% level. This framework is subject to additional conditions of at-sea observer coverage, identified in the sardine IFMP.

5. MONITORING AND EVALUATION

These management measures will be reviewed periodically to assess and measure the effectiveness of the measures in achieving the management objectives.

During periods of high concern in the WCVI (July 15 – October 1), the sardine Resource Manager will review daily catch/bycatch reports provided by the service provider. Specific areas or subareas may be closed during the season should concerns be identified with compliance with Conditions of Licence or increased levels of bycatch from historical levels.

In particular, Areas 24 and 26 have robust time/area closures in place and any level of salmon bycatch encountered during the period of high concern will make the respective area or subarea subject to closure. Areas 23, 25 and 27 have more tolerance for salmon encounters because of stock enhancements by hatchery fish or the presence of fish from different systems (i.e. the USA).

Reports from the service provider for Areas 23-27 from July 15 – October 1 will be provided to the sardine Resource Manager on a daily basis for review.

Monitoring of bycatch will be conducted in addition to the existing fishery monitoring measures for sardine (i.e. 100% dockside validation, logbooks, hauls, and at-sea observers).

Catch/bycatch data will be reviewed post-season to determine if there are concerns or suspected changes in fishing behaviour by vessel masters with or without an on-board observer. The monitoring program will continue to reflect the particular risks of the sardine fishery and may change over time.