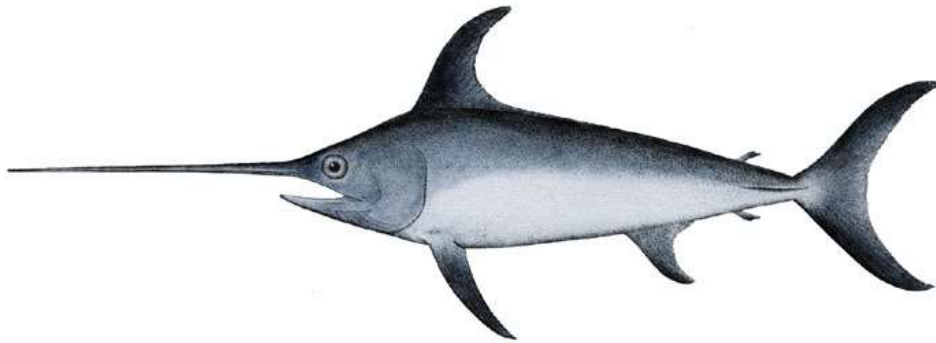


MSC SUSTAINABLE FISHERIES CERTIFICATION

North West Atlantic Canada Longline Swordfish



Public Comment Draft Report

September 2017

Prepared For: Nova Scotia Swordfishermen's Association (NSSA)
Prepared By: Acoura Marine Ltd
Authors: Paul Knapman, Kevin Stokes & Rob Blyth-Skyrme

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Glossary

C&P	Conservation and Protection Branch (DFO)
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPUE	Catch per unit effort
DFO	Fisheries and Oceans Canada
DMP	Dockside monitoring programme
EBSA	Ecologically and biologically significant area
EEZ	Exclusive economic zone
ENGO	Environmental non-governmental organisation
ETP	Endangered, threatened or protected (species)
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Sea
IFMP	Integrated fisheries management plan
IUCN	International Union for the Conservation of Nature
LRP	Limit reference point
LTRT	Leatherback Turtle Recovery Team
MCS	Monitoring, control and surveillance
MSC	Marine Stewardship Council
MSY	Maximum sustainable yield
NM	Nautical miles
RAP	Regional advisory process
SARA	Species At Risk Act
SSB	Spawning stock biomass
TAC	Total allowable catch
TRP	Target reference point
VME	Vulnerable marine ecosystem
VMS	Vessel monitoring system

1 Executive Summary

This report provides details of the MSC assessment process for the North West Atlantic Canada Longline Swordfish fishery for Nova Scotia Swordfishermen's Association. The assessment process began on 1st September 2016 and was concluded (to be determined at a later date).

This re-assessment was conducted using the MSC Certification Requirements (CR) version 1.3 (MSC 2013) default assessment tree with no changes made to the text of any default Performance Indicator (PI). The assessment followed CR version 2.0 process (MSC 2014). The report has been presented using the MSC Full Assessment Reporting Template version 2.0 (noting that the scoring section is from v1.3). The risk-based framework (RBF) was not used in this re-assessment.

A comprehensive programme of stakeholder consultations were carried out as part of this assessment, complemented by a full and thorough review of relevant literature and data sources. Furthermore, owing to a delay in publication of the Public Comment Draft Report, an additional period of time was provided to stakeholders to submit new information about the fishery.

A rigorous assessment of the wide ranging MSC Principles and Criteria was undertaken by the assessment team and a detailed and fully referenced scoring rationale is provided in Appendix 1 of this report.

The Target Eligibility Date for this assessment is 30th September.

The assessment team for this fishery assessment comprised of Paul Knapman (Team Leader and Principle 3); Kevin Stokes (Principle 1) and Rob Blyth-Skyrme (Principle 2). Paul MacIntyre was the traceability expert advisor.

Client fishery strengths

Principle 1: The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing, limit and target reference points are appropriate for the stock with the limit reference point being set at above a precautionary level at which there is an appreciable risk of impairing reproductive capacity; the harvest strategy is responsive to the state of the stock and designed to achieve stock management objectives reflected in the target and limit reference points; there are well defined and effective harvest control rules in place, and there is evidence that the tools used to implement the harvest control rules are effective at achieving the precautionary exploitation levels.

Principle 2: The fishery does not pose a risk of serious or irreversible harm to retained, bycatch or ETP species; habitat structure and function; and, key elements of the ecosystems structure and function.

Principle 3: The fishery management system operates within an effective and binding legal framework which ensures it is capable of delivering management outcomes consistent with MSC Principles 1 and 2; clear long and short term management objectives have been adopted; and, a comprehensive monitoring, control and surveillance system operates within the fishery.

Client fishery weaknesses

Principle 3: how the precautionary approach is used in decision-making processes for non-commercial species is not explicit within the management of the fishery; there is a lack of occasional external review of the fishery specific management system.

Determination

On completion of the assessment and scoring process, the assessment team concluded that: (to be determined at a later date).

Conditions & Recommendations

Performance Indicators 3.2.2 and 3.2.5 did not achieve an unconditional pass mark, and therefore binding conditions are placed on the fishery. A full explanation of these conditions is provided in Appendix 2 of this report, in summary, the areas covered by these conditions relate to how the precautionary approach is used in decision-making processes for non-commercial species; and, the requirement to have occasional external review of the fishery specific management system.

In addition, the assessment team made five recommendations. As these are not the result of a failure to meet the unconditional pass mark, they are non-binding; however in the opinion of the assessment team, they would make a positive contribution to ongoing efforts to ensure the long term sustainability of the fishery. Details of these recommendations are provided in Section 6.3 of this report.

For interested readers, the report also provides background to the target species and fishery covered by the assessment, the wider impacts of the fishery and the management regime, supported by full details of the assessment team, a full list of references used and details of the stakeholder consultation process.

2 Authorship and Peer Reviewers

2.1 Assessment Team

All team members listed below have completed all requisite training and signed all relevant forms for assessment team membership on this fishery.

Assessment team leader: Paul Knapman - Principle 3.

Paul is an independent consultant based in Halifax, Nova Scotia, Canada. Paul began his career in fisheries nearly 30 years ago as a fisheries officer in the UK, responsible for the enforcement of UK and EU fisheries regulations. He then worked with the UK government's nature conservation advisors (1993-2001), as their Fisheries Programme Manager, responsible for establishing and developing an extensive programme of work with fisheries managers, scientists, the fishing industry and ENGOs, researching the effects of fishing and integrating nature conservation requirements into national and European fisheries policy and legislation.

Between 2001-2004 he was Head of the largest inshore fisheries management organisation in England, with responsibility for managing an extensive area of inshore fisheries on the North Sea coast. The organisations responsibilities and roles included: stock assessments; setting and ensuring compliance with allowable catches; developing and applying regional fisheries regulations; the development and implementation of fisheries management plans; the lead authority for the largest marine protected area in England.

In 2004, Paul moved to Canada and established his own consultancy providing analysis, advisory and developmental work on fisheries management policy in Canada and Europe. He helped draft the management plan for one of Canada's first marine protected areas, undertook an extensive review on IUU fishing in the Baltic Sea and was appointed as rapporteur to the European Commission's Baltic Sea Regional Advisory Council.

In 2008, Paul joined Moody Marine as their Americas Regional Manager, with responsibility for managing and developing their regional MSC business. He became General Manager of the business in 2012. Paul has been involved as a lead assessor, team member and technical advisor/reviewer for more than 50 different fisheries in the MSC programme. He returned to fisheries consultancy in 2015.

Expert team member: Kevin Stokes - Principle 1.

Kevin is a fisheries science, management, and policy consultant with extensive international and Pacific experience. He has worked at senior management levels in both the public and private sectors as a fisheries scientist, manager, and advisor. Kevin worked for the Ministry, Agriculture, Fisheries and Food and the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) in the UK for 15 years. He was responsible for all finfish monitoring, assessment and advice and worked extensively in Europe, serving as chair of the EC Scientific, Technical and Economic Committee for Fisheries (STECF) and as UK representative on the International Council for the Exploration of the Sea (ICES) advisory Committee for Fisheries Management (ACFM), as well as chairing working groups and committees. He served on multiple UK research councils, led the UK scientific delegation to the International Whaling Commission (IWC) and served as UK Alternate IWC Commissioner for many years. He served for many years as an ad hominem member of the UK Special Committee on Seals. Kevin worked as Chief Scientist for the New Zealand Seafood Industry Council (SeaflC) for 9 years, responsible for science policy and process as well as leading a consulting group drawing on diverse international expertise. He has worked on a wide range of marine shellfish and finfish, and environmental issues and has provided advice nationally and internationally at senior governmental and ministerial levels, as well as

to fishing, processing and retail industries, and to NGOs. For nine years he chaired the New Zealand National Rock Lobster Management Group (NRLMG). Kevin was for many years a member of the New Zealand Institute of Directors and has worked on governance and strategy development projects, particularly in New Zealand. For the past 6 years, Kevin has worked as a private consultant in the general area of fisheries but extending to governance and wider advisory matters. He has worked extensively across the globe as well as in New Zealand, doing technical reviews; certification programme review and design work as well as certification assessment; governance review and design; and sustainability advice to retailers and processors. He has worked on Ecological Risk Assessment (ERA) design and implementation. In 2007 Kevin participated in the MSC Quality and Consistency work, reviewing advice on development of the new P1 CR, and as part of the group that led development of the new P2 and P3 CR. He has undertaken more than 60 MSC pre-assessments as well as acting as an assessor, auditor, and peer reviewer for multiple certification assessments, ranging from prawns to tunas. He has carried out work for a number of Conformity Assessment Bodies (CABs). From late 2013 for one year, Kevin worked exclusively to Conservation International, leading development work on the Global Tuna Initiative, with a focus on the Western Central Pacific. Among his current, contracted activities relevant to this assessment, he is involved in MSC certification and surveillance of tuna fisheries in the Indian Ocean. He previously undertook surveillance on the certified PNA non-associated purse seine fishery for skipjack in the WCPO.

Expert team member: Rob Blyth-Skyrme - Principle 2.

Rob started his career in commercial aquaculture, but subsequently shifted his focus to the sustainable management of wild fisheries. After his PhD he went to the Eastern Sea Fisheries Joint Committee, one of the largest inshore fisheries management bodies in England, where he became the Deputy Chief Fishery Officer. He then moved to Natural England, the statutory adviser to UK Government on nature conservation in English waters, to lead the team dealing with fisheries policy, science and nationally significant fisheries and environmental casework. Rob now runs Ichthys Marine Ecological Consulting Ltd., a marine fisheries and environmental consultancy. As well as carrying out general consultancy, he has undertaken all facets of MSC work as a lead assessor, expert team member and peer reviewer across a wide range of fisheries, including those targeting highly migratory species. Rob is a member of the MSC's Peer Review College, and has completed the MSC v1.3 and v2.0 training modules.

Expert advisor: Paul MacIntyre - Responsible for advice on MSC chain of custody (CoC).

Paul started working in the Aquaculture sector in 1975, managing salmon farms and processing factories for a large multi-national before transferring in 1990 to aquaculture audit and inspection. During the last 25 years Paul has carried out over 3,000 audits and inspections of aquaculture and fish processing operations across the UK salmon and trout industry and internationally in the cod, tilapia and shrimp aquaculture sectors. Paul's primary interest is salmonids however his role as Aquaculture Director with Acoura Marine has involved him in the development and trial audit of a number of new aquaculture and agricultural standards. Paul is a qualified Lead Assessor and approved to audit BRC, MSC / ASC Chain of Custody, GlobalGAP, Organic Aquaculture, Freedom Food, Label Rouge, Best Aquaculture Practices, ASC Salmon and Friend of the Sea. Paul also audits to UK and French retailer standards.

2.1.1 Peer Reviewers

Peer reviewers used for this report were Tim Huntington and Joe De Alteris. A summary CV for each is available in the **Assessment downloads** section of the fishery's entry on the MSC website.

Tim Huntington

Tim Huntington is a fisheries biologist with over 30 years' industry and consulting experience. His qualifications include a BSc (Hons) in Biological Sciences and MSc in Applied Fish Biology. He has worked in capture fisheries and aquaculture in over 60 countries worldwide, with a particular focus on Europe, the Middle East, Africa and Asia (including the Indian and Pacific Ocean countries). Following a number of industry and consulting posts, Tim has specialised in promoting sustainability in fisheries and aquaculture. This initially included working on a number of fisheries development projects for the Global Environment Facility, FAO and other agencies before focusing on the roles that eco-labelling can play in driving improved fishing practises and management. He has worked extensively with the MSC responsible fisheries programme, including leading pre-assessments, full assessments as well as chain of custody audits for a number of certification bodies including Acura, Intertek, MacAlister Elliott and SCS. He has participated as lead auditor or a team member on a number of UK, NE and NW Atlantic, Indian Ocean and Pacific Ocean fisheries and specialises in contributing to the Principle 2 elements. He also works with fisheries on fisheries improvement planning, using the MSC standard as a benchmark for baseline and incremental assessments. In addition to his work for the Certification Bodies, Tim has also worked direct for MSC, where his contributions have included a number of studies on chain of custody methodologies, looking at including aquaculture in the MSC fisheries standard and the 2011 review of environmental benefits of MSC certification. Tim is also the co-author of a number of reports published by the UN's Food and Agriculture Organisation (FAO) on the costs and benefits of fisheries certification for small-scale fisheries.

Tim has passed MSC training and has no Conflict of Interest in relation to this fishery.

Joseph DeAlteris

Dr. DeAlteris retired from the University of Rhode Island (URI) in May of 2012, and was awarded Professor Emeritus status. In 30 years of service to URI he is taught course work, conducted research, and developed outreach programs in fisheries conservation engineering, fish population dynamics and quantitative ecology, and shellfish aquaculture. He mentored more than 40 graduate students completing MS and PhD degrees. He served on numerous government committees including the National Research Council. He authored more than 35 publications in peer-reviewed journals, and also authored and co-authored numerous books, manuals, non-referred articles, and technical reports in the fields of fisheries biology, stock assessment and fishing gear technology.

Dr. DeAlteris has an international reputation as an expert in the field of stock assessment and fishing gear technology. He brings intimate knowledge of finfish and invertebrate fisheries and has considerable experience in MSC fishery evaluations. He has worked for several certifying bodies (CBs). Dr. DeAlteris has worked the full assessment of the Louisiana blue crab and Atlantic red crab fisheries, the Echebaster Indian Ocean tuna fishery, the re-assessment of British Columbia halibut fishery, and annual audits of Dungeness crab, red crab blue crab, Canadian haddock, Full Bay sea scallop and the shrimp fisheries. He has also conducted pre-assessments, and assessment peer reviews. He recently worked as a expert evaluator on the Global Seafood Sustainability Initiative (GSSI).

Joe has passed MSC training and has no Conflict of Interest in relation to this fishery.

2.1.2 RBF Training

RBF was not used for this fishery assessment.

3 Description of the Fishery

3.1 Unit(s) of Assessment (UoA) and Scope of Certification Sought

Acoura Marine Ltd confirm that the UoA is within scope of the MSC standard, i.e. it does not operate under a controversial unilateral exemption to an international agreement, use destructive fishing practices, target amphibians, birds, reptiles or mammals and is not overwhelmed by dispute.

3.2 UoA and Proposed Unit of Certification (UoC)

The UoA is defined as the specific aspect of the fishery the CAB and its assessment team evaluate during an MSC fishery assessment:

Species:	Atlantic Swordfish (<i>Xiphias gladius</i>)
Stock:	North Atlantic swordfish stock
Geographical area:	Atlantic Waters - Atlantic Canadian EEZ and international waters within the ICCAT Northern Swordfish Boundary Area (North of 5°N and west of 30°W).
Harvest method:	Pelagic Longline
Client Group:	Nova Scotia Swordfishermen's Association (NSSA)
Other Eligible Fishers:	Harvesters who have an associate harvester membership of the NSSA. Primary or secondary processors who have a cost sharing agreement with the NSSA.

This UoA was used as it is compliant with client wishes for assessment coverage and in full conformity with MSC criteria.

The Unit of Certification (UoC) is the part of the UoA that is covered by the MSC certificate, if the assessment is successful. The UoC may subsequently be expanded up to the limit defined by the UoA, through the addition of other eligible fishers, via the mechanism of certificate sharing. The proposed UoC for this fishery is:

Species:	Atlantic Swordfish (<i>Xiphias gladius</i>)
Stock:	North Atlantic swordfish stock
Geographical area:	Atlantic Waters - Atlantic Canadian EEZ and international waters within the ICCAT Northern Swordfish Boundary Area (North of 5°N and west of 30°W).
Harvest method:	Pelagic Longline
Client Group:	Nova Scotia Swordfishermen's Association (NSSA)
Other Eligible Fishers:	Harvesters who have an associate harvester membership of the NSSA. Primary or secondary processors who have a cost sharing agreement with the NSSA.

3.3 Final UoC(s)

(PCR ONLY)

The final Unit of Certification for this fishery is as defined below. This has not changed throughout the process. Alternatively provide rationale for why this has changed.

Species:	
Stock:	
Geographical area:	
Harvest method:	
Client Group:	
Other Eligible Fishers:	

3.3.1 Total Allowable Catch (TAC) and Catch Data

Table 1. TAC and catch of swordfish for the swordfish longline fishery

TAC (tonnes)	Year	2015	Amount	13,700 tonnes
UoA share of TAC	Year	2015	Amount	13,700 tonnes
UoC share of TAC	Year	2015	Amount	2,187.97 tonnes
Total green weight catch by UoC	Year (most recent)	2015	Amount	1,409.17 tonnes
	Year (second most recent)	2014	Amount	1,397.59 tonnes

3.4 Overview of the fishery

The following text has been adapted from the Public Certification Report (PCR), available from: <https://fisheries.msc.org/en/fisheries/north-west-atlantic-canada-longline-swordfish/@@assessments>

Swordfish in Atlantic Canada are harvested using both pelagic longline and harpoon. Both fisheries have MSC certification and are in the process of re-assessment. The gear type used in this Unit of Certification (UoC) and considered in this report is the pelagic longline.

Large pelagic longline fishing, primarily for swordfish, began in Canadian waters in the early 1960s, as Canadian vessels adopted methods developed by the Japanese and Americans in fishing for tuna and swordfish. During the early years of the fishery, vessels targeted mainly swordfish, however, since 1999, there has been a noted shift toward targeting tuna - bigeye, yellowfin and albacore. This shift in target species not only influences where and how the fishery is conducted but also the composition of the by-catch. The change in fishing is attributed to good market prices for tuna species and the decline in swordfish quotas that occurred in the late 1990s (DFO, 2004a).

Entry to the swordfish fishery has been limited to 77 longline licenses for both swordfish and other tunas since 1992. Licenses have been fixed at this number, but may be re-issued, within certain policy restrictions, from one fisher to another (DFO, 2013). Pelagic longline vessels are also licensed to fish with harpoon gear, but since 2000, any landings by harpoon gear are attributed to the longline quota. 40-50 vessels are active in the fishery in any given year. Of these, between 15 and 20 vessels may also fish with harpoon (T. Atkinson pers. comm., 2016). All longline license holders in the fleet are represented by the Nova Scotia Swordfishermen's Association (NSSA).

In addition to the license holders that are members of NSSA, there is an offshore tuna licence based in the Maritimes Region, also authorized to operate a longline fishing operation Atlantic-wide. The offshore tuna longline license is not represented by NSSA, but by its owner/managers directly. Since it is not a member of the client group, the operation is not considered a part of the UoC, and therefore product from that vessel is not eligible to use the MSC logo.

The swordfish Total Allowable Catch (TAC) is set by International Commission for the Conservation of Atlantic Tunas (ICCAT) (see below) and Canada receives an annual quota. The offshore tuna license receives a 5 t by-catch allocation for swordfish. The remaining Canadian quota is then allocated between the longline and harpoon sectors based on the sectors historic catch of swordfish. This results in the longline fleet receiving 90% and harpoon 10% of the Canadian quota. The longline quota is then allocated to active harvesters in the fleet based on an Individual Transferable Quota (ITQ) sharing formula. The maximum permanent transfer of quota that can be held by any individual licence holder in the fleet is limited to 5% of the fleet's quota. The NSSA manages the fleet quota and DFO manages the total Canadian quota to ensure landings remain within the national allocation.

The vessels are multi-species so they can direct effort to other species, e.g. lobster, groundfish. Swordfish fishing is not their primary fishery. Vessels range in length from 45-99 feet, with only seven licenses for vessels greater than 65 feet in length, however licences are transferable and so these licenses may be used on smaller vessels. Only two large size class vessels have operated in recent years (T. Atkinson, pers. comm., 2016).

Principle ports of landing in the Atlantic Region include Shelburne, Sambro, Wood's Harbour and Clark's Harbour in Nova Scotia, and St. John's and Fermeuse in Newfoundland & Labrador.

The fishery follows the seasonal migration of swordfish and tuna through Canadian waters during summer and fall as they move into the productive waters of the continental shelf slope and shelf basins, areas where water temperatures form a distinct thermocline. As a result, the fishery usually starts in April and may run through to December. The longline fishing effort generally progresses from west to east and back again and from offshore to inshore along the edge of the continental shelf (see Figure 1). Between the late 1990s and mid 2000s fishing east of the Grand Banks, outside of the Canadian exclusive economic zone (EEZ), was not uncommon. However, fewer of these long distance trips are now taking place due to a lack of persistent warm core rings and sharp horizontal temperature gradients indicative of productive fishing, the high cost of fuel and an abundance of swordfish closer to shore (ICATT 2015, T. Atkinson pers. comm., 2016).

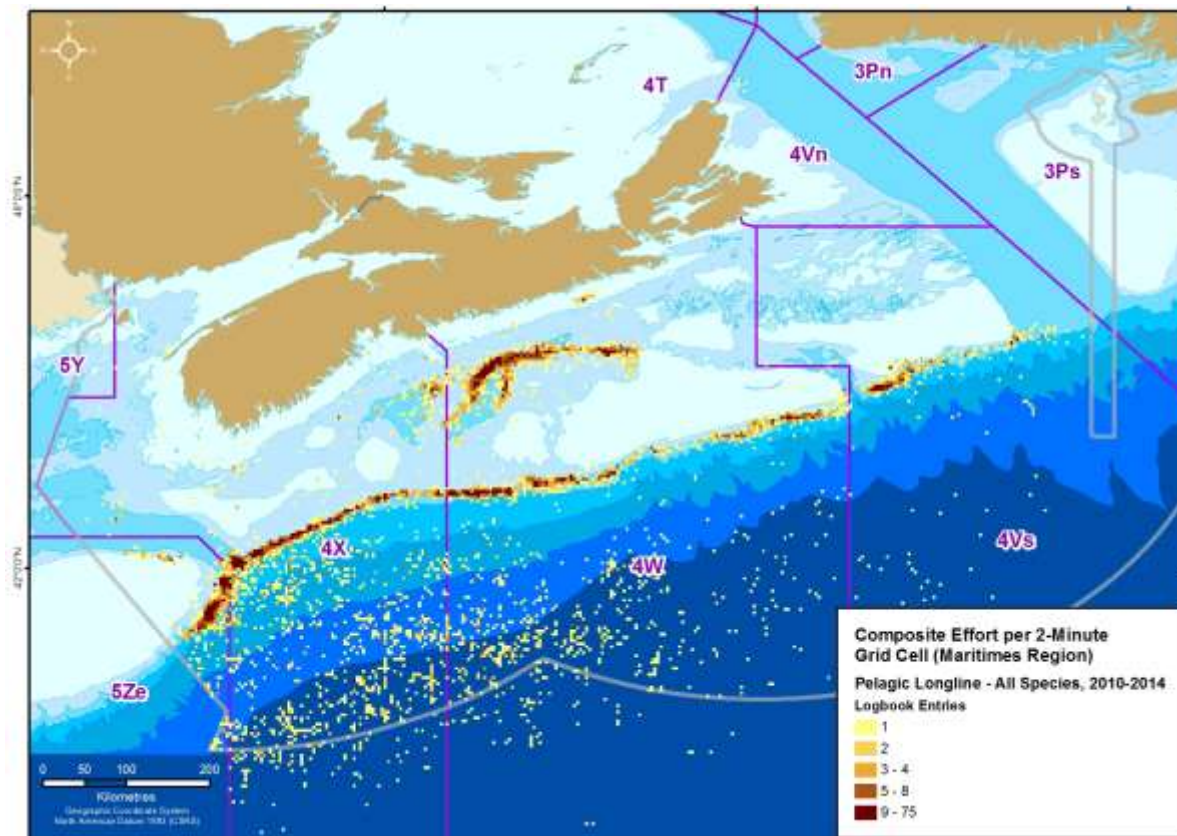


Figure 1. Fishing effort distribution for the Canadian pelagic longline fleet between 2010-14 (DFO 2016)

Pelagic longline fishing involves the use of a main monofilament fishing line with a series of shorter monofilament lines (“snoods” or “gangions”) with baited size 16/0 corrodible circle hooks attached at intervals. The number of hooks per set varies with line configuration and target catch. Buoy lines are attached to both ends of the longline to a ‘high flyer’ buoy and fastened along its length to brightly colored floats and flags that mark the location of the gear at the surface. The lines are set near the surface – 7 metres or shallower, depending on weather and fish location - and suspended over water depths greater than 150 meters. The lines are not anchored. Automatic Identification System (AIS) beacons are placed at intervals along the length of the mainline enabling tracking of the gear.

When targeting swordfish, the lines generally are deployed at sunset and hauled at sunrise to take advantage of swordfish nocturnal near-surface feeding habits. Except for vessels of the distant water fleet which undertake extended trips, fishing vessels preferentially target swordfish during periods when the moon is full to take advantage of increased densities of pelagic species near the surface.

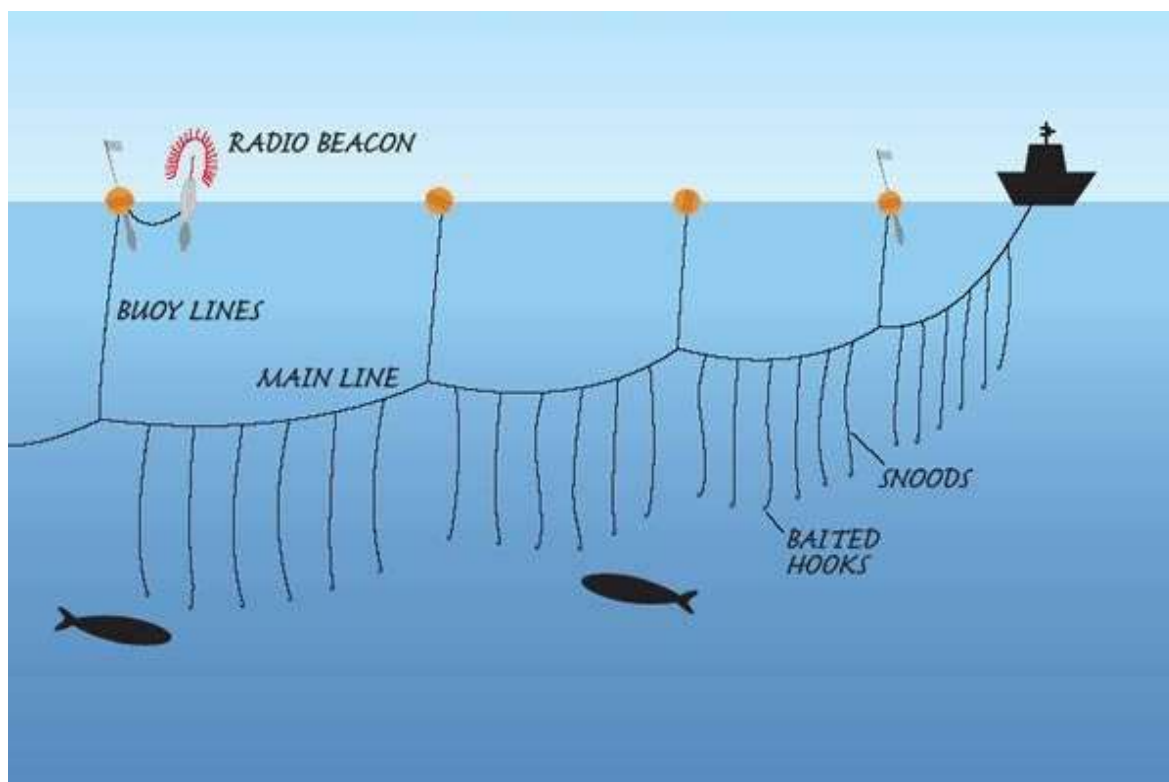


Figure 2. A schematic showing the general configuration of a pelagic longline (Source: From Australian Fisheries Management Authority <http://www.afma.gov.au/portfolio-item/longlining/>)

Each vessel sets between 20 and 60 miles of gear per night, with the number of hooks per set ranging between 600 and 1,100. Hooks are baited with mackerel or squid, depending on the target species – mackerel are the preferred bait for swordfish, squid are preferred for tuna. During an average 14-day trip, up to 10 sets will be deployed.

For the past decade, estimated catches (landings plus dead discards) from the North Atlantic stock have averaged about 13,000 t per year with the average annual catch of the Canadian longline fishery being about 1,300 t (ICCAT, 2014). All the swordfish are landed and exported gutted and head removed. All the swordfish are exported to the US. In 2013, the export value was estimated to be \$12.3 million (DFO 2015).

Table 2. Landings of Atlantic Swordfish by the Canadian pelagic longline fleet, 1987-2014. Source: Data from ICCAT, 2013 (Table 7) and DFO, 2015.

Year	Total estimated catches of North Atlantic swordfish	Canadian Pelagic longline landings
1987	20,236	876
1988	19,513	874
1989	17,250	1,097
1990	15,672	819
1991	14,934	953
1992	15,394	1,487

Year	Total estimated catches of North Atlantic swordfish	Canadian Pelagic longline landings
1993	16,738	2,206
1994	15,501	1,654
1995	16,872	1,421
1996	15,222	646
1997	13,025	1,005
1998	12,223	927
1999	11,622	1,136
2000	11,453	923
2001	10,011	984
2002	9,654	954
2003	11,442	1,216
2004	12,175	1,161
2005	12,480	1,470
2006	11,473	1,238
2007	12,302	1,142
2008	11,050	1,115
2009	12,081	1,061
2010	11,553	1,182
2011	12,523	1,351
2012	13,875	1,330
2013	12,018	1,145
2014	10,801	1,272

Owing to their highly migratory behavior North Atlantic swordfish and tuna stocks come under the management of the International Commission for the Conservation of Atlantic Tunas (ICCAT). ICCAT is the Regional Fisheries Management Organisation (RFMO) responsible for the management of tunas and other highly migratory species in the Atlantic Ocean and adjacent seas, in particular, the Mediterranean Sea.

Canada is one of 51 member countries or “Contracting Parties” to ICCAT and manages the Canadian swordfish fishery at a national level through the Department of Fisheries and Oceans (DFO). Management measures have been outlined by DFO in the Canadian Atlantic Swordfish and Other Tunas Integrated Fisheries Management Plan (IFMP) (DFO, 2013).

Canadian representatives from DFO and the fishing sector participate at ICCAT meetings, contributing to scientific research and management discussions with respect to swordfish and other large pelagic species.

The first specific ICCAT measures for the North Atlantic swordfish stock were put in place in 1991 owing to a declining stock. Member countries were required to reduce their annual catch by 15% of their 1988 harvest levels. Minimum size limits were also introduced at the same time. In 1995, ICCAT set national allocations for member countries with a history of fishing swordfish: Canada, the USA, Spain and Portugal. Japan, whose swordfish catches are a by-catch in other tuna fisheries, was restricted to 8% of their total north Atlantic catch of tunas. In 1999, ICCAT implemented the Atlantic swordfish recovery plan, with the objective of rebuilding the stock.

In the period between 1995 and 2000, further reductions in the annual Canadian quota resulted in the need for significant changes to the management of the Canadian fishery. Fleet allocations to each of the swordfish longline and harpoon fleets were made and the swordfish longline fishery implemented a number of measures designed to redirect effort to tuna species within their fleet allocation. These management measures were further refined with the introduction of ITQs in 2002.

A successful introduction of methods to decrease fishing effort by ICCAT Contracting Parties lead to improved stock status. In 2009 an assessment of the stock was completed and stated that the stock had been rebuilt to 99.9% of the Maximum Sustainable Yield (MSY). For precautionary reasons the TAC was reduced to 13,700 t for 2010 and remains at this level.

3.5 Principle One: Target Species Background

3.5.1 Stock Biology and Structure

Swordfish (*Xiphias gladius*) belong to the family Xiphiidae, in the suborder Scombroidei. Swordfish can be found in the tropical and temperate waters of all oceans between 45°N and 44°S. They are distributed widely in the Atlantic Ocean and Mediterranean Sea. Over their range, variation in the distribution by size and sex is evident, both geographically and vertically. Larger individuals are found in deeper colder waters and males are more prevalent in warmer waters than females.

Swordfish mostly spawn in western, warm tropical and subtropical waters throughout the year, although seasonality has been reported in some of these areas. They are found in the colder, temperate waters during summer and autumn months. Swordfish have been observed spawning in the Atlantic Ocean in water less than 75 m. Solitary males and females appear to pair up during the spawning season. The most recognized spawning site is in the Mediterranean, off the coast of Italy, where in July and August males are observed chasing females. Traditional Atlantic spawning areas are the Gulf of Mexico, south Sargasso Sea, and east of the Antilles in the Straits of Florida, along the southeast coast of the US. New spawning areas have recently been identified between 10 and 15 °N and longitudes 30 and 40°W. Spawning may occur throughout the year, though peak activity is between December and July, in water temperatures ranging from 23-26°C (ICCAT, 2016).

Swordfish can reach a maximum weight greater than 500 kg. Females grow faster than males and reach a larger maximum size. Swordfish are difficult to age, but tagging studies have shown that some swordfish can live up to 15 years. The size at sexual maturity of swordfish varies with location. About 50% of females are considered to be mature by age five, at a length of about 180 cm. The ICCAT Standing Committee for Research and Statistics (SCRS) has adopted size at first maturity (L50%) of 179 cm (5 years) for swordfish in the North Atlantic stock. However, the most recent information indicates a smaller length and age at maturity. Males reach maturity one year earlier than females. Reproductive activity of females appears to be related to temperatures in the epipelagic layers (NMFS, 2012), and is largely restricted to the warm tropical regions of the western Atlantic (ICCAT, 2008).

There is individual variation in fecundity, with females carrying from 1 million to 29 million eggs in their gonads. The pelagic eggs are buoyant, measuring 1.6 -1.8 mm in diameter. Embryonic development occurs during the 2½ days following fertilization. Young swordfish reach about 140 cm LJFL (lower-jaw fork length) by age three.

Despite ageing difficulties, growth curves have been developed for both males and females showing sexual-dimorphism in which females at older ages are larger than males. However, the application of these growth relationships to traditional age-structured assessments has been limited because size frequency information is limited to landed fish which are gilled and gutted (with sex therefore undetermined). Unisex growth curves have been developed; however, application for assessment purposes is limited.

Larval swordfish feed on copepods, but at an early juvenile age their diet consists almost entirely of fish. Adults feed on a wide variety of prey including groundfish, invertebrates, pelagic and deepwater fish. Adults are believed to feed throughout the water column, and based on recent electronic tagging studies undertake diurnal migrations, rising to the surface mixed layer at night and descending to deeper waters during the day to feed on fishes and squids (ICCAT, 2008). Smaller prey is generally eaten whole, while larger prey is often observed with slash marks from the swordfish rostrum. It is unclear when and how often the bill is used during feeding (ICCAT, 2016). Swordfish are apex predators, located at the top of

the food chain. Predation on swordfish (other than human) is expected to be limited to that on young and infirm swordfish.

Swordfish are known to migrate in significant numbers between the relatively hot subtropical waters and the temperate waters of the North and South Atlantic. This has been shown through tagging recoveries where tagged fish were released from Northwest, Northeast and Southwest Atlantic fisheries. Importantly, these tagging programs have not shown extensive movements across the Equator (ICCAT, 2006). The results of these programs have not shown the existence of extensive trans-Atlantic migration of this species, but these observations are limited by problems associated with use of conventional tags (ICCAT, 2016).

Significant differences in size, age at onset of sexual maturity, and growth parameters between the Atlantic and Mediterranean provides evidence of distinct stocks. Genetic work indicates significant difference in the genetic structure of swordfish between the populations of the four regions: North Atlantic, South Atlantic, Mediterranean, and Indian Ocean, with a Mediterranean population significantly distinguished from the others (ICCAT 2006). However, boundaries between these stocks are not well defined biologically. Areas of mixing of the North and South Atlantic Stock probably occur around latitude 5°N and, perhaps, further north, between 10 and 20°N. In addition, there is evidence to support exchanges between the Mediterranean and Northeast Atlantic. Some consider the area of mixing of these two stocks to be around 10°W (ICCAT, 2016).

Based on this information, current understanding is that there is a separate Mediterranean group, and separate North and South Atlantic groups. Thus, ICCAT assesses and manages swordfish on three distinct units of management: North Atlantic, South Atlantic and Mediterranean, with the North and South stocks separated at 5° North.

3.5.2 Information and Stock Assessment

Stock assessment model runs are based on multiple data inputs, as reported by member states to ICCAT, including catches, effort and catch per unit effort (CPUE) by fleet, catches by size, and biological and distributional/migration data.

ICCAT requires members to report information regarding fishing activities, including catches, catches by size, effort and CPUE and biological and distributional/migration data. ICCAT Recommendation 13-02 (ICCAT, 2013b) states that "...all Contracting Parties catching swordfish in the North Atlantic shall endeavor to provide annually the best available data to the SCRS, including catch, catch at size, location and month of capture on the smallest scale possible, as determined by the SCRS. The data submitted shall be for broadest range of age classes possible, consistent with minimum size restrictions, and by sex when possible. The data shall also include discards (both dead and alive) and effort statistics, even when no analytical stock assessment is scheduled. The SCRS shall review these data annually."

Responsibility for reporting lies with the member countries, in the developed fisheries the monitoring mechanism include logbook reports, monitoring of dealers, at-sea observers and dockside sampling of length frequencies. The composition and operations of fleets involved in the North Atlantic swordfish fishery are well understood. The species is caught by a number of fishing countries due to its broad geographical distribution, with a variety of directed and opportunistic fisheries. Data are generally considered to be of good quality, but national coverage for each data source varies. For example, observer coverage in national fisheries, based on statistically designed programs, is as follows: US pelagic longline fishery coverage, consistent with NMFS guidelines, is 8%; Spanish pelagic longline fishery

coverage, consistent with recommendations by IEO scientists and the General secretariat for Fisheries, is 1%; Canadian longline fishery coverage, consistent with the DFO recommended minimum coverage, is 5%. The assessment processes, however, take account of sampling coverage when weighting data sources and estimates of management metrics are probabilistic.

Catches for the North Atlantic swordfish stock are currently about 12,000 t per year (see Figure 5). While more than 20 countries may report North Atlantic swordfish catches annually, landings are dominated, in decreasing rank, by EU (Spain and Portugal), USA, and Canada, followed by Morocco and Japan. In 2011, for example, based on ICCAT (2013, Table 1), the EU (Spain and Portugal) landed 44% of the total, while the USA landed 20%, and Canada landed 12%.

Discards are not reported by all countries, with USA and Canada providing the most consistent data, with occasional reporting by other nations including Japan and the Republic of Korea. The annual discard tonnage (all assumed dead for assessment purposes) varies and it is not easy to discern any trends. Based on the landings and discards reported in ICCAT (2013), the total discarding (as reported) appears to be less than 0.5% of total catches.

ICCAT Rec 2011-18 (ICCAT, 2011a) states that, "IUU (Illegal, Unreported and Unregulated) fishing is one of ICCAT's most pressing problems, threatening the sustainability of the stocks and undermining ICCAT's credibility. It affects mostly Atlantic bluefin tuna (BFT) but also other ICCAT species, including bigeye, yellowfin, and skipjack tuna, and many shark species." The Recommendation does not mention North Atlantic swordfish in the list of species affected by IUU. Where IUU is considered a potential problem for stock assessment, the ICCAT SCRS incorporates stock assessment runs which include estimates of unreported catch. This has not been done for North Atlantic swordfish. As part of certification assessments, the Canadian DFO (M. Comely, pers. comm., 2016) and US National Marine Fisheries Service (pers. comm.) have confirmed that the SCRS has no reason to believe there are any substantial unreported catches of North Atlantic swordfish, based on current information.

There are no fishery independent indices available so stock abundance indices are restricted to fishery dependent sources. Indices of fishable biomass (from 1963) and abundance at age (from 1978) are available and are used in the stock assessment from many harvesting nations (Japan, Portugal, Morocco, Canada, Spain age-specific and age-aggregated, and USA) (ICCAT, 2013). These represent about 3 – 5 swordfish generations of monitoring. These indices are standardised singly and in combination and are used both in stock assessment and in annual updates on advice.

Stock abundance is monitored through the SCRS assessment process, with a swordfish assessment every 3-4 years. The last full stock assessment was in 2013 (ICCAT, 2013), with a full assessment next scheduled for 2017. Annual updates have been provided in all other years, including provision of annual management advice. The assessment(s) are carried out by the Swordfish Working Group, including preparatory meetings for data compilation and review, and analyses. Final assessments are reviewed by the SCRS which develops management advice to the Commission.

Stock production (age-aggregated) and/or age-based models are commonly used in assessments to assess stock biomass and fishing mortality in relation to reference points, perhaps associated with harvest control rules. Age-structured approaches, but not stock production ones, allow a description and consideration of year-class specific processes. For North Atlantic swordfish, it is not possible to reliably age 5+ fish and, for the age groups in the fishery (less than age 5), spatial and temporal dynamics, which may vary considerably

by region in the North Atlantic, further complicate an age-structure approach. These make a stock production approach an appropriate option until these issues are resolved. The SCRS uses two production approaches (ASPIC and BSP2) to provide advice to the ICCAT Commission relative to B_{MSY} . In addition, the SCRS has explored the use of age-based models (using size and growth data) to investigate age-specific processes such as recruitment and as an additional check on the robustness of advice developed using production models. For all assessments, model fitting follows standard procedures using well-understood diagnostic approaches and includes a range of sensitivity and other tests before determining a base case run for advisory purposes (see ICCAT, 2013).

Probabilistic projections using the production model base case runs are made for a range of future constant catches to determine the probability of both the biomass remaining above B_{MSY} for the next decade and of fishing mortality, F , exceeding F_{MSY} (see Table 3). These are used by the SCRS to frame management advice to the Commission.

Table 3. Estimated probabilities (%) that both the fishing mortality is below F_{MSY} and spawning stock biomass is above SSB_{MSY} for North Atlantic swordfish from ASPIC base model (from ICCAT (2016) SWO-ATL-Table 2).

TAC	2014	2015	2016	2017	2018	2019	2020	2021
13000	88	91	92	92	92	92	93	93
13200	88	91	91	92	92	91	91	91
13400	88	90	90	89	89	89	89	89
13600	88	88	88	88	87	87	86	85
13700	88	88	88	87	85	84	84	83
13800	88	87	86	85	83	82	82	81
13900	88	86	84	83	82	80	79	77
14000	88	84	82	80	79	77	75	74
14100	88	82	80	78	76	74	72	69
14200	88	81	79	76	73	71	67	63
14300	88	80	76	73	70	65	61	56
14400	88	78	74	71	65	60	54	47
14600	88	74	69	63	56	47	40	33
14800	88	70	62	51	43	34	29	22
15000	88	64	55	42	32	25	17	13

3.5.3 Stock status

The most recent stock assessment was reported in the ICCAT SCRS report for 2013 (ICCAT, 2013). Multiple assessment models and sensitivity runs were considered, using data up to 2011. Annual updates considering catches taken are provided in subsequent SCRS reports, with the most recent in 2016 (ICCAT, 2016).

Stock status in 2011 based on the 2013 base case assessment run is:

Maximum Sustainable Yield	13,660 t (80% confidence interval 13,250 - 14,080 t)
B_{MSY}	65,060 t (54,450 - 76,700 t)
Relative Biomass (B_{2011}/B_{MSY})	1.14 (1.05 - 1.24)
Relative Fishing Mortality Rate F_{2011}/F_{MSY}	0.81 (0.73 - 0.91)

The phase plot of relative biomass against relative fishing mortality rate is shown in Figure 3. At the end of 2011/start of 2012, biomass is estimated greater than B_{MSY} and the fishing mortality rate is estimated below that which would produce MSY. Figure 4 shows the separate trends in relative biomass and fishing mortality rate.

It is clear from Figure 3 and Figure 4 that North Atlantic swordfish underwent high exploitation in the 1980s and 1990s such that biomass was less than B_{MSY} and fishing mortality rate was above F_{MSY} . Management actions were initiated in the 1999 under ICCAT Recommendation 99-02 (ICCAT, 1999), which established a rebuilding program for North Atlantic swordfish.

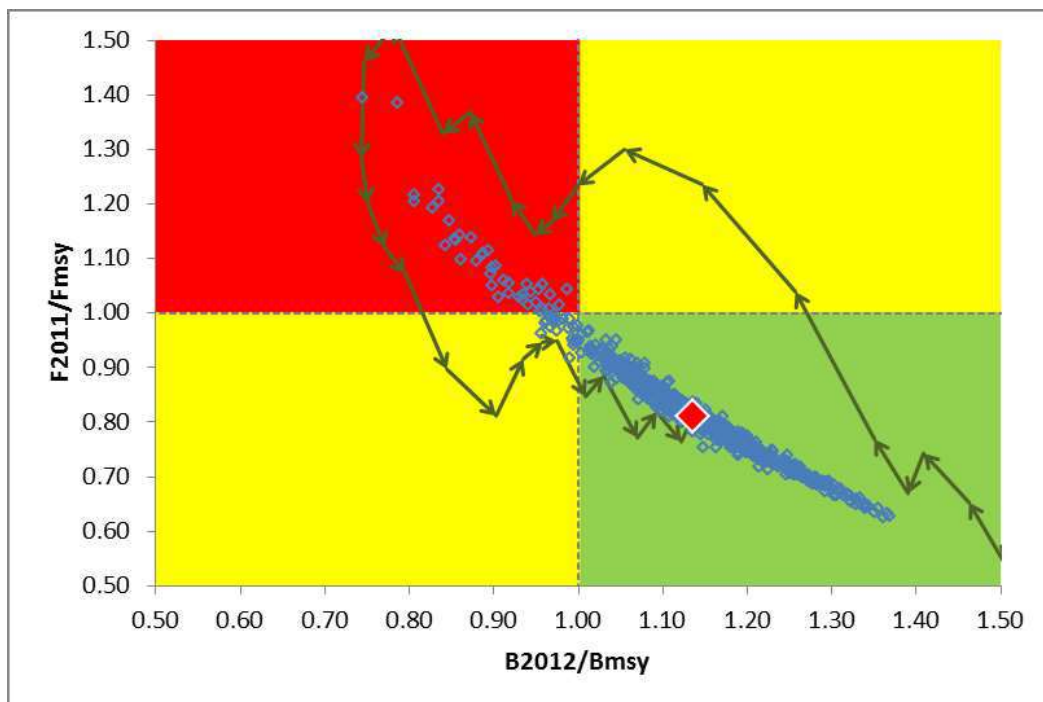


Figure 3. Kobe plot for North Atlantic swordfish status at the start of 2012. Points show the results from 1,000 bootstrap runs, solid diamond the estimated median point and the solid line the track of the stock status since 1950. (ASPIC base case north run2). (Source: from ICCAT, 2013, Fig. 22)

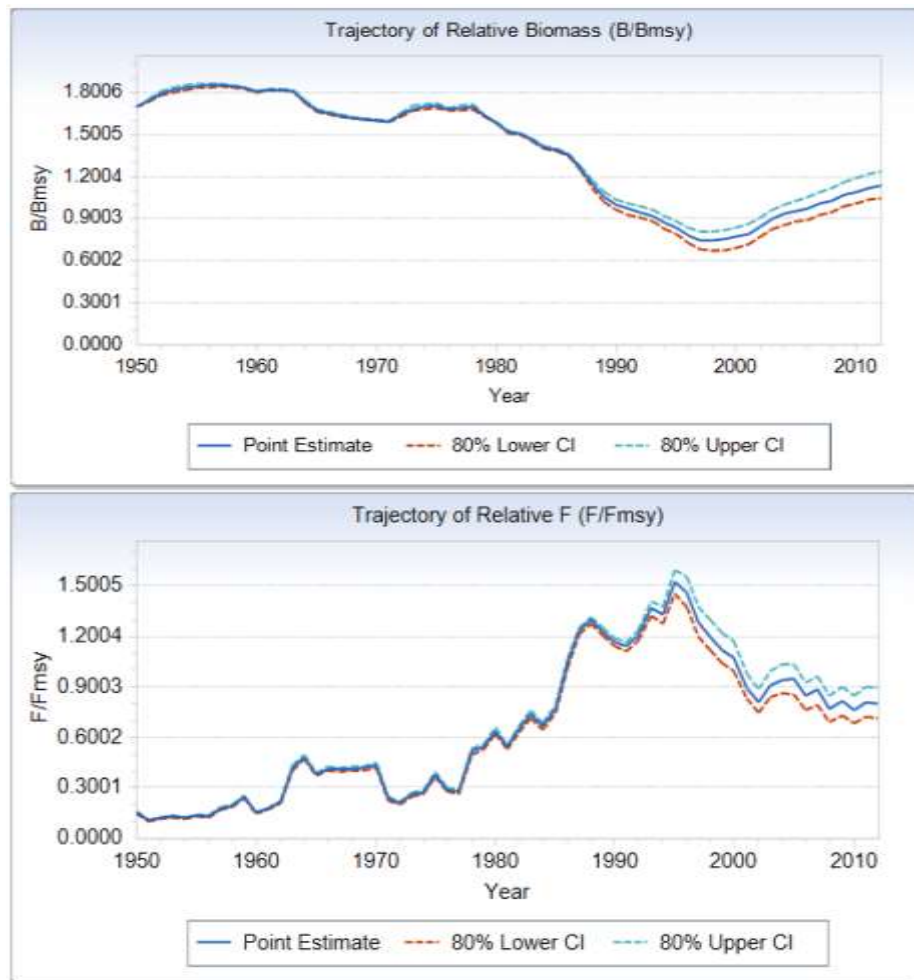


Figure 4. Trends in North Atlantic swordfish relative biomass (top) and fishing mortality (bottom) point estimates from the ASPIC base case (run2) model. (Source: from ICCAT, 2013, Fig. 13).

The biomass trend shows a steady increase since 2000. The current results indicate that the stock is at or above B_{MSY} . The relative trend in fishing mortality shows that the level of fishing peaked in 1995, followed by a decrease until 2002, a small increase in the 2003-05 period, and a slight downward trend since then. Fishing mortality has been below F_{MSY} since 2005.

The results suggest that at the end of 2011 there was greater than 90% probability that the stock was at or above B_{MSY} , and the rebuilding started in 1999 had been successful. However, it is important to note that since 2003 the catches were below the TAC's, greatly increasing the chances for rapid recovery. The SCRS in 2013 noted that catches in 2012 were for the first time since 2002 above the TAC (13,975 t *cf* 13,700 t). ICCAT (2016), however, reports that catches have not exceeded the TAC except in that one year and that since the TAC was set at 13,700 t in 2010, the annual catch has averaged 12,057 t, with catches in 2014 and 2015 just above 11,000 t (see Figure 5). The TAC for 2017 remains at 13,700 t (ICCAT, 2016a).

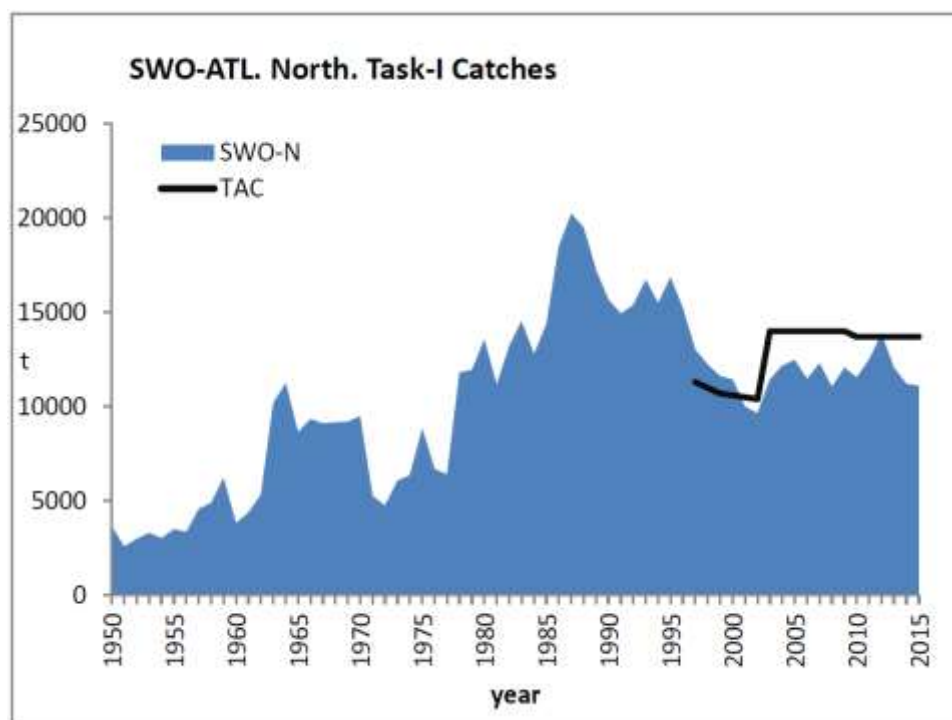


Figure 5. North Atlantic swordfish catches and TAC (t), for the period 1950-2015. (Source: from ICCAT, 2016, Fig. SWO-ATL Figure 2)

The SCRS provides ICCAT with an updated outlook each year, based on the most up to date information available. The advice in 2016 is that continued catches consistent with the TAC of 13,700t would maintain the stock at a level consistent with the Convention objectives over the next decade (see also Table 3). Consistent with the SCRS advice, the TAC for 2017 is set at 13,700t (ICCAT, 2016a).

3.5.4 Reference points

A clear, generic target reference point (TRP) exists for all ICCAT stocks through provisions in the ICCAT Basic Texts (2007).

The Basic Texts include repeated language reflecting the preambular reference to, “maintaining the populations of these fishes at levels which will permit the maximum sustainable catch”. Article VIII states that, “The Commission may, on the basis of scientific evidence, make recommendations designed to maintain the populations of tuna and tuna-like fishes that may be taken in the Convention area at levels which will permit the maximum sustainable catch. These recommendations shall be applicable to the Contracting Parties under the conditions laid down in paragraphs 2 and 3 of this Article.”

All evidence from ICCAT SCRS and Commission reports, Recommendations and Resolutions, including for example rebuilding provisions for North Atlantic swordfish (ICCAT, 1999) support that the ICCAT core objective follows the Basic Texts, with clear use of B_{MSY} as a TRP used in management decisions for swordfish.

This is well exemplified by the timeline of stock status and ICCAT management measures presented in Figure 6, itself an expansion of Nielson et al (2013).

While the TRP is established implicitly in the Basic Texts, the limit reference point (LRP) is not. The Commission, through adoption of Recommendation 15-07 on the development of

Harvest Control Rules (HCR) has specified that the SCRS advise the Commission on setting, amongst other things, LRPs for all stocks, including a 5-year schedule for the establishment of species-specific HCRs (see below). At this stage, therefore, ICCAT planning for HCR development, including LRP, TRP and other settings, is well developed and in-train.

In the meantime, it is possible to infer from SCRS advice and ICCAT Recommendations an implicit reference point in operation for ongoing North Atlantic swordfish.

Management action on North Atlantic swordfish relates to ensuring the stock is at or above the objectives laid out in the Convention; that is, B_{MSY} (see also PI 1.1.2). This is well exemplified in Recommendation 99-02 (ICCAT, 1999) which established a rebuilding program for North Atlantic swordfish when the stock was estimated to be at $0.65 B_{MSY}$ and with fishing mortality estimated as $1.34 F_{MSY}$. The Commission adopted rigorous measures (catch reductions and various technical measures) and has followed through since that time to ensure rebuilding (see Figure 6), with the stock currently above B_{MSY} with a high probability (see above), going beyond the rebuilding objective of achieving B_{MSY} with a greater than 50% probability.

The Commission introduced rebuilding measures in response to stock and fishing mortality status estimates, effectively treating either or both of those estimates as triggers, or thresholds for action. The trigger was to rebuild to meet Convention objectives but implicitly also to avoid further stock decline. These 1999 status estimates might generally be interpreted as management threshold reference points but it is not unreasonable here to treat them as LRPs which the Commission sought to avoid with a high probability by rebuilding to B_{MSY} within a specified timeframe and taking appropriate, sustained action to meet that goal.

This is further emphasized by Recommendation 13-02 (ICCAT, 2013b) for the Conservation of North Atlantic Swordfish, which at paragraph 5 states, “The SCRS and the Commission shall begin a dialogue to allow for the development of harvest control rules (HCRs) for consideration in any subsequent recommendations. Further, while the HCRs are being developed, should the biomass approach the level which triggered the establishment of the previous rebuilding plan [Rec 99-02] then management measures should be considered to avoid further decline and begin to rebuild the stock.” The use of the same trigger is re-emphasised in Recommendation 16-03 (ICCAT, 2016a).

The same Recommendations (13-02 and 16-03), at paragraph 4 and 6 respectively, state, “When assessing stock status and providing management recommendations to the Commission in 2016, the SCRS shall consider the interim limit reference (LRP) of $0.4 * B_{MSY}$ or any more robust LRP established through further analysis”. This paragraph appears to specify a more explicit LRP (as $0.4 B_{MSY} = 20\% B_0$ given the stock assessment model in use assumed $B_{MSY} = 50\% B_0$) but leaves open options for “more robust” alternatives even within 2016.

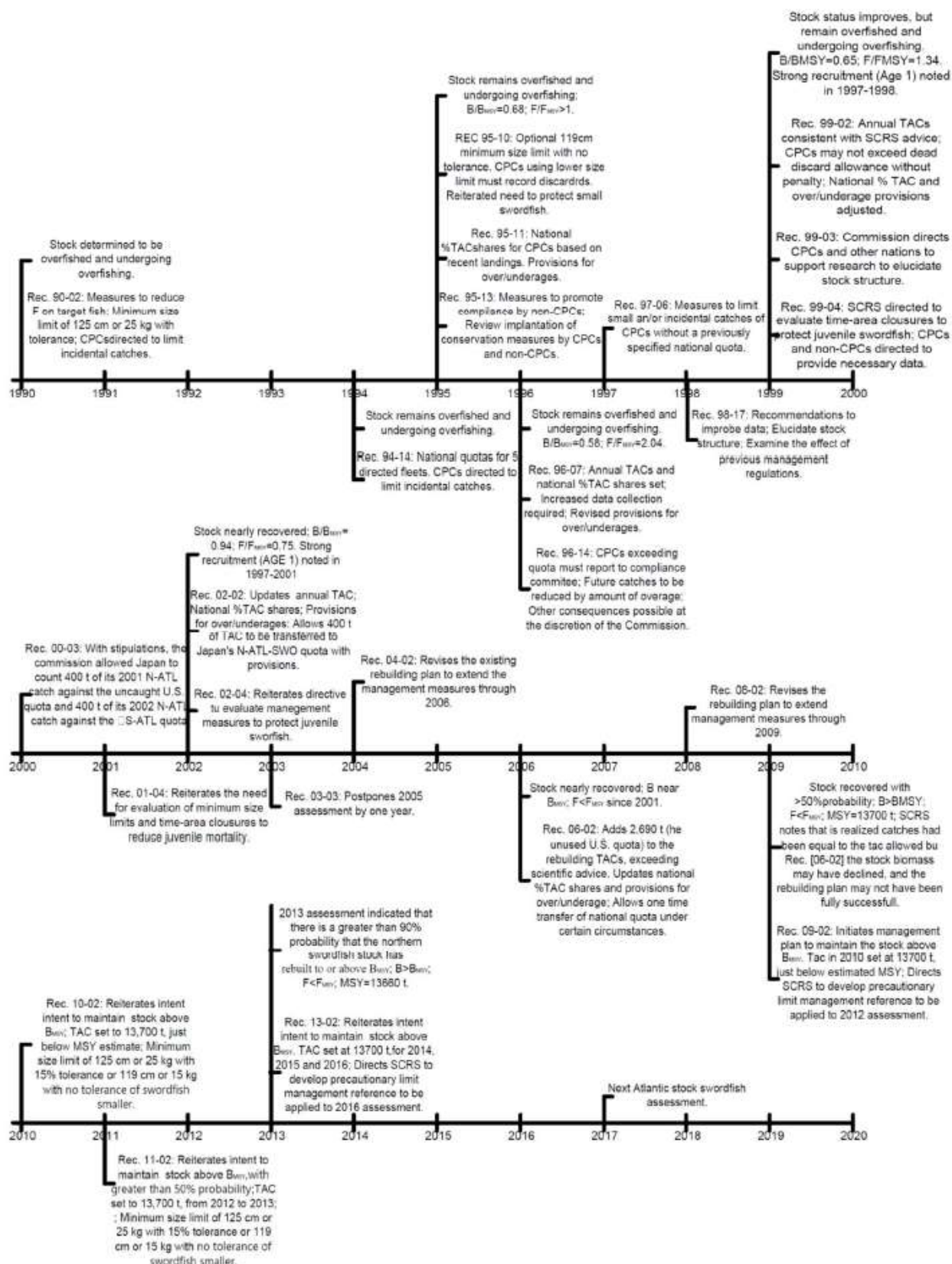


Figure 6. Timeline of stock status and ICCAT management measures for north Atlantic swordfish stock extracted and expanded from Neilson et al. 2013. The extension from 2010 to 2017 was done by the team. Source (Figure 18, from Bureau Veritas, North and South Atlantic Swordfish Spanish Longline Fishery, Public Comment Draft Report, October 2016)

3.5.5 Harvest Strategy and Harvest Control Rule

The harvest strategy consists of an objective (B_{MSY}), annual monitoring (of catch and CPUE) and assessment (either full every 3-4 years or updated annually by the SCRS) of biomass and fishing mortality and setting of TACs, national catch limits, and other measures (seasonal closures, minimum landing sizes) by the Commission to achieve the objective. An implicit LRP can be inferred from rebuilding measures started in 1999 (ICCAT, 1999). The strategy of setting TACs to achieve the target biomass over the long term has maintained the stock above the MSC default limit reference point ($0.5 B_{MSY}$) and has rebuilt the stock to well above B_{MSY} (Figure 3). Continued use of the strategy is expected to ensure this continues, with the latest SCRS advice for a TAC of 13,700 t (ICCAT, 2016; based on Table 3, above) and the Commission agreement to this (ICCAT, 2016a), expected to maintain biomass above B_{MSY} by 2021 with greater than 83% probability.

The Commission has consistently set annual TACs consistent with the advice of the SCRS. The most dramatic example of this is the implementation of the 10-year rebuilding plan in 1999 (ICCAT, 1999) in response to SCRS-assessed declines in stock biomass. This resulted in reductions in TACs until signs of stock recovery in 2003, at which time the TACs were permitted to increase. Therefore, as the stock conditions changed, the TACs of the rebuilding plan were amended to respond to these changes.

Data are reported regularly and are of sufficient quality to allow the SCRS to conduct regular, robust stock assessments (ICCAT, 2013), and provide advice to the Commission. The SCRS evaluates management measures in place and recommends changes as required to meet management objectives. In the case of swordfish, this advice has been used to set TACs and other measures. Current measures outlined in the latest ICCAT recommendation for the conservation of North Atlantic swordfish (ICCAT, 2016a) include an overall TAC, national catch limits, between nation transfer agreements, national annual transfer conditions, minimum landing sizes, and vessel size restrictions.

Every three to four years, the SCRS undertakes a full assessment of the stock. This includes a review of the catch, fishery dependent indices of abundance, models of historical population size, and biological reference points. Advice from the full assessment is used by the Commission to update the TAC and other management measures. The SCRS reviews the elements of the harvest strategy annually and provides advice to the Commission on whether the strategy has been successful and whether it needs to be changed. The SCRS has regularly reviewed and conducted stock assessments, re-estimated (re-calculated) and re-evaluated the appropriateness of the reference points, and whether the objectives of the Convention are being met. The Commission takes the advice of the SCRS under consideration and agrees binding Recommendations. Recommendations for the management of the North Atlantic swordfish stock have generally been in line with the advice from the SCRS. Neilson et. al. (2013) provide a detailed history of the status of the North Atlantic swordfish stock as assessed by the SCRS and management actions taken by ICCAT to recover the status of the stock, demonstrating how the harvest strategy has been modified over time following the successive reviews of its effectiveness by the SCRS. An update to the Neilson et al analysis is shown in Figure 6 of this report.

Although there is no evidence that the current harvest strategy as a whole has been evaluated in detail, the annual review and record of changes over time demonstrates that the strategy has achieved its rebuilding objectives and has maintained biomass above B_{MSY} . ICCAT has also recognised limitations in the harvest strategy and has agreed to develop a HCR to evaluate and design an explicit and more robust harvest strategy. ICCAT (2016a

dictates that the dialogue to enable HCR development will take place between the SCRS and Commission and also puts in place a well-defined set of rules, including reaffirmation of the 1999 trigger point for rebuilding, a 10-year rebuilding time frame (should it be needed), and a specification that the Commission must set harvest levels consistent with SCRS advice to ensure B_{MSY} is reached/maintained within the time frame.

In 2011, ICCAT adopted Recommendation 11-13 (ICCAT, 2011b) setting out principles of decision making for ICCAT conservation and management measures (ICCAT 2011). This describes a generally understood decision-making framework based on a harmonized format for tuna RFMO science bodies to convey advice (the so-called Kobe 2 Strategy Matrix, or 'K2SM') agreed at the Second Joint Meeting of Tuna RFMOs in June 2009 in San Sebastian, Spain. Recommendation 11-13 guides the Commission in developing management measures responsive to stock status as represented on the Kobe Plot (a standardized "four quadrant, red-yellow-green" format, which is widely embraced as a practical, user-friendly method to present stock status information). The Recommendation sets out clearly how management measures should be designed depending on where status is estimated in the Kobe quadrants, generally codifying the type of action taken in Recommendation 99-2.

In all cases, the requirement set out is that management measures should be designed to maintain the stock at, or rebuild to, B_{MSY} , with a high probability. Where appropriate (overfishing and overfished) the adoption of a rebuilding plan is required.

The framework does not specify actions with respect to approaching limits but is designed around achieving targets with high probability, considering both stock status and exploitation rate with requirements to reduce exploitation rate when it is above F_{MSY} . By definition, as the framework is designed to achieve the TRP with high probability and maintain fishing mortality below F_{MSY} , it will also act to maintain the stock above any implicit LRPs.

Building from the general decision-making framework, ICCAT recommendation 13-02 (ICCAT, 2013b) specifies that: The SCRS and the Commission shall begin a dialogue to allow for the development of HCRs for consideration in any subsequent recommendations. Further, while the HCRs are being developed, should the biomass approach the level which triggered the establishment of the previous rebuilding plan [Rec 99-02] then management measures should be considered to avoid further decline and begin to rebuild the stock.

This has now been replaced by Recommendation 2016-03 (ICCAT, 2016a) which goes further: In line with the provisions of Recommendation by ICCAT on the Development of Harvest Control Rules and of Management Strategy Evaluation [Rec. 15-07], paragraph 3, the SCRS and the Commission shall begin a dialogue to allow for the development of HCRs for consideration in any subsequent recommendations. Further, while the HCRs are being developed, should the biomass approach the level which triggered the establishment of the previous rebuilding plan [Rec. 99-02], then the Commission shall adopt a 10-year rebuilding plan, with harvest levels, as recommended by the SCRS, that will meet the Commission's objectives of maintaining or rebuilding stocks to B_{MSY} within the defined time period.

This, latest recommendation commits to the HCR development dialogue but meanwhile commits to a well specified decision-making framework, including a defined trigger for action, clear time frame for rebuilding (if required) and commitment to use of SCRS-advised harvest levels (TAC) to ensure B_{MSY} is achieved.

3.6 Principle Two: Ecosystem Background

3.6.1 Background

The Canadian swordfish longline fishery is conducted mainly in Atlantic Canadian waters off Nova Scotia, at the shelf edge and in shelf basins, with occasional trips to international waters outside the 200 mile Canadian EEZ (Section 3.4). The surface longline gear used in the fishery drifts freely and never comes in to contact with the seabed.

3.6.2 Retained and bycatch species

As detailed in Table 4, which shows landings data for the 2011-2015 period, a variety of species are taken in the fishery in addition to swordfish. Observer data for the fleet for the same period are then shown in Table 5. Although the observer data are only a sample, and the landings data are comprehensive, the observer data are important for MSC assessments because they sample the total catch (i.e., all catches, whether retained or discarded). In this case, the observer data show that while the retained catch is dominated by swordfish, blue shark (*Prionace glauca*) also comprise a significant part of the catch as a discarded species.

In common with most other fisheries, it is not necessarily the case that all individuals of a particular species are either retained or discarded in the swordfish longline fishery – some individuals of each species may be retained, while others of the same species may be discarded. Therefore, while the classification of a species as ‘retained’ or ‘discarded’ may be somewhat arbitrary, it has been carried out for the purposes of the reassessment on the basis of the observer data showing the most common fate for each species.

MSC guidance is that, when considering catches of retained and bycatch species, a species may normally be considered to be ‘main’ if it comprises more than 5% of the total catch by weight. The corollary is that retained and bycatch species comprising less than 5% of the catch may normally be considered to be ‘minor’, unless it is of particular vulnerability or if the total catch of the fishery is large (CR v1.3, GCB3.5.2 and 3.8.2, MSC 2013b).

In this regard, bigeye tuna (*Thunnus obesus*) and bluefin tuna (*Thunnus thynnus*) are assessed as main retained species on the basis of vulnerability, while shortfin mako shark (*Isurus oxyrinchus*), yellowfin tuna (*Thunnus albacares*) and albacore tuna (*Thunnus alalunga*) are considered to be minor retained species. More details are provided in the following sections of the report.

Blue shark are assessed as a main bycatch species, while porbeagle shark (*Lamna nasus*), thresher shark (*Alpas vulpinus*) and white marlin (*Kajikia albida*) are assessed as minor bycatch species. More details are again provided in the following sections of the report. All other species comprising less than 0.1% of the catch are considered to be negligible components of the catch (Table 4), and are not considered further here or in scoring.

The MSC also requires that bait species are considered against the retained species performance indicators (CR v1.3, CB3.5.5, MSC 2013a). The swordfish longline fishery uses approximately 680 t of bait in total, annually, of which approximately 33% (224 t) is Argentine squid (*Illex argentius*), 23% (156 t) is Atlantic mackerel (*Scromber scrombus*) from Spain, and 44% (300 t) is chub mackerel (*Scromber japonicus*) (Troy Atkinson, pers. comm.). If the total catch of the fishery is scaled according to the ratio between the observed retained swordfish catch and the swordfish landings, such that the mean total annual catch is approximately 3,280 t (Table 6), then the total catch of the fleet + bait is approximately 3,960 t (i.e., 3,280 t + 680 t). On this basis, Argentine squid (5.7%) and chub mackerel (7.6%) both qualify as main retained species through comprising more than 5% of the ‘catch’, while Atlantic mackerel from Spain (4%) qualifies as a minor retained species for comprising less than 5% of the ‘catch’.

Table 4: Landings data for the swordfish longline fleet in kgs, 2011-2015 (DFO, pers. comm.).

Species	2011	2012	2013	2014	2015	Mean Weight (kgs, 2011-15)	Mean % (2011-2015)
Swordfish	1,295,180	1,329,961	1,145,294	1,272,405	1,409,167	1,290,401	77.16
Bigeye tuna	119,223	147,552	184,250	181,939	247,873	176,167	10.53
Yellowfin tuna	48,877	92,900	71,164	34,024	58,843	61,162	3.66
Bluefin tuna	59,627	37,858	51,705	35,277	49,572	46,808	2.80
Mako shark	30,832	24,431	29,282	48,205	82,404	43,031	2.57
Albacore tuna	20,474	24,874	26,388	37,446	30,352	27,907	1.67
Mahi mahi	6,371	13,061	32,610	13,307	15,018	16,073	0.96
Porbeagle shark	9,706	16,230	3,181	2,731	503	6,470	0.39
White marlin	757	2,038	2,491	4,582	2,517	2,477	0.15
Dusky shark	0	0	4,652	0	0	930	0.06
Blue shark	0	1,020	0	0	0	204	0.01
Tuna, unspecified	0	391	446	46	0	177	0.01
Blue marlin	47	82	0	494	193	163	0.01
Basking shark	0	0	733	0	0	147	0.01
Shark, unspecified	0	575	0	0	0	115	0.01
Pelagic, unspecified	0	0	0	39	181	44	0.00
Groundfish, unspecified	0	0	155	0	23	36	0.00
Skipjack tuna	2	18	0	0	24	9	0.00
Other finfish, unspecified	0	0	0	6	0	1	0.00
Total	1,591,096	1,690,991	1,552,351	1,630,501	1,896,670	1,672,322	100.00

Table 5: Observer data (retained + discarded catch in kgs) for the swordfish longline fleet, 2011-2015 (DFO, pers. comm.)

		Observed weight (kgs, retained+ discarded)					Percentage of observed catch					Mean %
Species		2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	All years
Blue shark	<i>Prionace glauca</i>	97,821	119,219	36,307	75,945	62,022	45.46	42.11	57.00	53.90	25.64	44.82
Swordfish	<i>Xiphias gladius</i>	112,407	129,838	19,731	49,009	136,010	46.28	45.86	30.97	34.78	56.22	42.82
Bigeye tuna	<i>Thunnus obesus</i>	2,486	5,472	2,333	5,056	7,531	1.16	1.93	3.66	3.59	3.11	2.69
Bluefin tuna	<i>Thunnus thynnus</i>	6,737	6,864	463	128	17,089	3.13	2.42	0.73	0.09	7.06	2.69
Shortfin mako shark	<i>Isurus oxyrinchus</i>	3,251	7,826	1,088	4,713	7,982	1.51	2.76	1.71	3.34	3.30	2.53
Yellowfin tuna	<i>Thunnus albacares</i>	0	6,605	1,057	3,341	3,456	0.00	2.33	1.66	2.37	1.43	1.56
Leatherback sea turtle	<i>Dermochelys coriacea</i>	831	1,116	1,095	350	2,254	0.39	0.39	1.72	0.25	0.93	0.74
Porbeagle shark	<i>Lamna nasus</i>	3,209	763	312	139	2,718	1.49	0.27	0.49	0.10	1.12	0.69
Albacore tuna	<i>Thunnus alalunga</i>	110	516	658	775	1,078	0.05	0.18	1.03	0.55	0.45	0.45
Thresher shark	<i>Alopias vulpinus</i>	1,139	489	175	330	713	0.53	0.17	0.27	0.23	0.29	0.30
White marlin	<i>Kajikia albida</i>	0	321	195	896	166	0.00	0.11	0.31	0.64	0.07	0.22
Loggerhead sea turtle	<i>Caretta caretta</i>	0	2,300	20	20	163	0.00	0.81	0.03	0.01	0.07	0.19
Atlantic manta ray	<i>Manta birostris</i>	0	0	180	0	425	0.00	0.00	0.28	0.00	0.18	0.09
Blue marlin	<i>Makaira nigricans</i>	0	422	57	175	57	0.00	0.15	0.09	0.12	0.02	0.08
Dolphin (ns)	Dolphin (ns)	0	710	0	0	0	0.00	0.25	0.00	0.00	0.00	0.05
Pelagic stingray	<i>Pteroplatytrygon violacea</i>	0	160	30	18	32	0.00	0.06	0.05	0.01	0.01	0.03
Great hammerhead shark	<i>Sphyrna mokarran</i>	0	210	0	0	0	0.00	0.07	0.00	0.00	0.00	0.01
Black marlin	<i>Istiompax indica</i>	0	180	0	0	0	0.00	0.06	0.00	0.00	0.00	0.01
Shark (not identified)	Shark (ns)	0	50	0	0	75	0.00	0.02	0.00	0.00	0.03	0.01
Longfin mako shark	<i>Isurus paucus</i>	0	0	0	0	95	0.00	0.00	0.00	0.00	0.04	0.01
Wahoo	<i>Acanthocybium solandri</i>	0	18	0	15	0	0.00	0.01	0.00	0.01	0.00	0.00
Oceanic whitetip shark	<i>Carcharhinus longimanus</i>	0	0	0	0	30	0.00	0.00	0.00	0.00	0.01	0.00
Smooth hammerhead shark	<i>Sphyrna zygaena</i>	0	0	0	0	30	0.00	0.00	0.00	0.00	0.01	0.00
King mackerel	<i>Scomberomorus cavalla</i>	0	12	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Great blackbacked gull	<i>Larus marinus</i>	0	0	0	2	3	0.00	0.00	0.00	0.00	0.00	0.00
Greater shearwater	<i>Puffinus gravis</i>	0	4	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Total		215,166	283,095	63,701	140,912	241,929	100	100	100	100	100	100

Key: Target species, Main retained, Minor retained, Main bycatch, Minor bycatch, ETP species, Negligible species

Table 6: Estimated total catch based on observer data (retained + discarded catch in kgs) scaled to swordfish landings, 2011-2015, with the scaling factors by year (DFO, pers. comm.).

Species	Estimated total catch (kg, retained + discarded)					Estimated Mean Weight (kg, 2011-15)
	2011	2012	2013	2014	2015	
Blue shark	1,146,558	1,389,251	2,370,571	2,000,513	655,315	1,512,442
Swordfish	1,317,520	1,512,994	1,288,284	1,290,976	1,437,061	1,369,367
Bigeye tuna	29,138	63,765	152,327	133,183	79,571	91,597
Bluefin tuna	78,964	79,986	30,230	3,372	180,560	74,622
Shortfin mako shark	38,105	91,196	71,038	124,148	84,337	81,765
Yellowfin tuna	0	76,968	69,014	88,007	36,516	54,101
Leatherback sea turtle	9,740	13,005	71,495	9,220	23,815	25,455
Porbeagle shark	37,613	8,891	20,371	3,661	28,718	19,851
Albacore tuna	1,289	6,013	42,962	20,415	11,390	16,414
Thresher shark	13,350	5,698	11,426	8,693	7,533	9,340
White marlin	0	3,741	12,732	23,602	1,754	8,366
Loggerhead sea turtle	0	26,802	1,306	527	1,722	6,071
Atlantic manta ray	0	0	11,753	0	4,490	3,249
Blue marlin	0	4,918	3,722	4,610	602	2,770
Dolphin (ns)	0	8,274	0	0	0	1,655
Pelagic stingray	0	1,864	1,959	474	338	927
Great hammerhead shark	0	2,447	0	0	0	489
Black marlin	0	2,098	0	0	0	420
Shark (not identified)	0	583	0	0	792	275
Longfin mako shark	0	0	0	0	1,004	201
Wahoo	0	210	0	395	0	121
Oceanic whitetip shark	0	0	0	0	317	63
Smooth hammerhead shark	0	0	0	0	317	63
King mackerel	0	140	0	0	0	28
Great blackbacked gull	0	0	0	53	32	17
Greater shearwater	0	47	0	0	0	9
Total	2,672,278	2,672,278	3,298,887	4,159,191	3,711,849	3,279,678

Calculation for scaling factor

	Swordfish Landings	Swordfish observed retained	Scaling factor (%)
2011	1,295,180	110,501	8.532
2012	1,329,961	114,131	8.582
2013	1,145,294	17,541	1.532
2014	1,272,405	48,304	3.796
2015	1,409,167	133,370	9.464
Mean	1,290,401	84,769	6.38

Key: Target species, Main retained, Minor retained, Main bycatch, Minor bycatch, ETP species, Negligible species

3.6.2.1 Retained species

Bigeye tuna – Main retained

The following section is summarised from ICCAT (2015d).

Bigeye tuna are distributed throughout the Atlantic Ocean between 50°N and 45°S, but not in the Mediterranean Sea. This species swims at deeper depths than most other tuna species and exhibits extensive vertical movements. They exhibit relatively fast growth, reaching about 105 cm fork length at age three, 140 cm at age five, and 163 cm at age seven, but fish over 200 cm are relatively rare. Various pieces of evidence, such as a lack of identified genetic heterogeneity, the time-area distribution of fish and movements of tagged fish, suggest an Atlantic-wide single stock for this species.

The bigeye tuna stock is exploited by three major gears (longline, baitboat and purse seine fisheries) and by many countries throughout its range, but ICCAT has detailed data on the fishery for this stock since the 1950s. The size of fish caught varies among fisheries: medium to large fish for the longline fishery, small to large for the directed baitboat fishery, and small for other baitboat and purse seine fisheries.

In 2015, results from a non-equilibrium production model and an integrated statistical assessment model, which can account for temporal changes in selectivity, were used to determine the status of the resource. Multiple runs of each model were completed, and both assessment models suggested that biomass decreased throughout the period investigated, with the exception of one run of the non-equilibrium production model where a recovery was observed since 2005. Both assessment models showed that fishing mortality (F) increased sharply by the late 90s, then fluctuated to reach a similar level in 2004/2005, and increased again in 2011 before decreasing over the most recent three years.

Overall, in 2014, the Atlantic bigeye tuna stock was estimated to be overfished and overfishing was occurring. Projections indicate that catches at the current TAC level of 85,000 t will have around 30% probability of recovering the population to a level that is consistent with the ICCAT objectives by 2028. It was noted that increased harvests of bigeye tuna on FADs could have had negative consequences for the productivity of bigeye tuna fisheries (e.g. reduced yield at MSY and increased SSB required to produce MSY). On this basis, and if an increase in long-term sustainable yield is desired, it was recommended that effective measures be found to reduce FAD-related and other fishing mortality of small bigeye tunas.

The annual landings of Atlantic bigeye tuna in the swordfish longline fishery has averaged 176 t over the 2011-2015 period (Table 4), which accounts for just 0.2% of the TAC for this species. It is noted that the estimated total annual (retained + discarded) catch of bigeye tuna based on scaled observer data is 91.6 t (Table 6), which is only half of the reported landings. However, almost all of the observed bigeye tuna was retained (2011-2015 = 95.5%), and so the landings data are highly likely to be a good indicator of the total bigeye tuna catch. This indicates that bigeye tuna likely represents approximately 4.7% of the total catch ($176 / 0.955 = 184$; $184 / 39.60 = 4.7\%$). The possibility that the catch of bigeye tuna in the swordfish longline fishery has exceeded 5% of the total, and the stock assessment results which indicate that bigeye is a vulnerable species, means that bigeye tuna is assessed as a main retained species.

Bluefin tuna – Main retained

The following section is summarised from ICCAT (2014a).

Atlantic bluefin tuna have a wide geographical distribution living mostly in temperate Atlantic waters and adjacent seas. Individuals preferentially occupy the surface and subsurface waters of the coastal and open-sea areas, but archival tagging and ultrasonic telemetry data indicate that bluefin tuna can frequently dive to depths of more than 1,000 m. Bluefin tuna is also a highly migratory species that seems to display a homing behaviour and spawning site fidelity in both the Mediterranean Sea and Gulf of Mexico, which constitute the two main spawning areas being clearly identified today. Less is known about feeding migrations within the Mediterranean and the North Atlantic, but results from electronic tagging indicated that bluefin tuna movement patterns vary considerably between individuals, years and areas.

The Western Atlantic bluefin tuna stock (i.e., the stock that is taken in the swordfish longline fishery) was last assessed in a 2014 update assessment; this considered data up to and including 2013 (ICCAT 2014a). It was noted that the conclusions of the assessment did not capture the full degree of uncertainty in the assessments and projections, but the 2014 assessment estimated trends that are consistent with previous analyses in that spawning stock biomass declined steadily from 1970 to 1992 and then fluctuated around 25 to 30% the 1970 level for about the next decade. In recent years, however, there appears to have been a gradual increase in spawning stock biomass, from about 32% of the 1970 level in 2003 to an estimated 55% in 2013.

Since 1998, when the rebuilding plan was adopted, the SSB has increased by 70%. The stock has experienced different levels of fishing mortality (F) over time, depending on the size of fish targeted by various fleets. Fishing mortality on spawners (ages 9 and older) declined markedly after 2003. ICCAT (2014a) noted that a key factor in estimating MSY -related benchmarks is the highest level of recruitment that can be achieved in the long term. Assuming that average recruitment cannot reach the high levels from the early 1970s, recent F (2010-2013) is 36% of F_{MSY} and SSB_{2013} is about 225% of SSB_{MSY} . In contrast, estimates of stock status are more pessimistic with respect to spawning biomass if a high recruitment potential scenario is considered, with $F = 88\%$ of F_{MSY} and $SSB_{2013} = 48\%$ of SSB_{MSY} . However, the 2014 assessment is the first where the western Atlantic bluefin tuna stock was estimated to not be undergoing overfishing under both recruitment scenarios.

Catches of bluefin tuna from the Western Atlantic component in all fisheries have averaged approximately 1,720 t annually for the 2011-2014 period. Landings in the swordfish longline fishery have averaged 46.8 t over the 2011-2015 period (Table 4), which therefore accounted for 2.7% of the catch for this species. It is noted that the estimated total annual (retained + discarded) catch of bigeye tuna based on scaled observer data is 74.6 t (Table 6). Assuming total mortality of all bluefin tuna caught, this would still comprise just 4.3% of the reported catch. Although bluefin tuna represents only approximately 2.7% of the swordfish longline catch, its vulnerability and high value means that it is assessed as a main retained species.

Shortfin mako shark – Minor retained

Shortfin mako shark was designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Threatened in Atlantic Canada in April 2006. A 10-year review process of the classification has recently started (DFO 2016f). Biological information on shortfin mako shark is somewhat limited, but this species is known to migrate over long distances throughout the North Atlantic. In Atlantic Canadian waters, shortfin mako is typically associated with warm waters such as those of the Gulf Stream. They have been documented on Georges and Browns banks, along the continental shelf of Nova Scotia, and the Grand Banks of Newfoundland. However, no known evidence of important habitat (e.g., pupping or mating grounds) exists in Atlantic Canadian waters (DFO 2016f).

The latest assessment of shortfin mako shark (ICCAT 2012a) utilised 16 runs of a Bayesian surplus production model, which gave very consistent results. All the runs found that the median of the current stock abundance was above B_{MSY} . All runs also found that the median F was less than F_{MSY} , except for the run that used estimated catches from effort before 1997. A catch-free-age-structured production model was also applied to the North Atlantic stock of shortfin mako. Estimates of SSB/SSB_{MSY} across all scenarios explored ranged from 1.63 to 2.04 and estimates of F/F_{MSY} ranged from 0.16 to 0.62. ICCAT (2012a) concluded that the results indicated in general that the status of the North Atlantic shortfin mako shark stock is healthy and the probability of overfishing is low.

The annual landing of shortfin mako shark in the swordfish longline fishery has averaged 43 t over the 2011-2015 period (Table 4), while the estimated total annual (retained + discarded) catch of shortfin mako in the fishery based on scaled observer data is 81.7 t (Table 6). This estimated total catch accounts for approximately 2.3% of the approximately 3,500 t of shortfin mako shark which has been caught annually in the North Atlantic in recent years (ICCAT 2012a).

Yellowfin tuna – Minor retained

The following section is summarised from ICCAT (2016c).

Yellowfin tuna is a cosmopolitan species distributed mainly in tropical and subtropical oceanic waters. The exploited sizes range from 30 cm to 170 cm fork length. Although the existence of distinct spawning areas might imply separate stocks, or substantial heterogeneity in the distribution of yellowfin tuna, a single stock for the entire Atlantic is currently assumed. This assumption is based upon information such as observed transatlantic movements (from west to east) indicated by conventional tagging and longline catch data that indicates yellowfin are distributed continuously throughout the tropical Atlantic Ocean.

Yellowfin tuna have been exploited by three major gears (longline, baitboat and purse seine fisheries) and by many countries throughout its range. Detailed data are available since the 1950s. Overall Atlantic catches have declined by nearly half from the peak in 1990 (193,600 t) to 103,400 t estimated for 2014.

The most recent full assessment was conducted in 2011. At that time, overfishing was not likely to be occurring, but there was only an estimated 26% chance that the stock was not overfished. Continuation of catch levels in the order of 110,000 t was expected to lead to a biomass somewhat above B_{MSY} by 2016 with a 60% probability. These projections have not been updated, however the overall catches in 2012-2014 were lower than 110,000 t, which could result in a higher probability of achieving the management objective within the same time frame. As for bigeye tuna, if an increase in long-term sustainable yield is desired, it was recommended that effective measures be found to reduce FAD-related and other fishing mortality of small yellowfin tunas.

The annual landing of yellowfin tuna in the swordfish longline fishery has averaged 61 t over the 2011-2015 period (Table 4), which accounts for <0.1% of the catch from the stock (ICCAT 2016c). It is noted that the estimated total annual (retained+ discarded) catch of yellowfin tuna based on scaled observer data is 54.1 t (Table 6), but this includes 2011, during which there were no observed catches of yellowfin tuna. Whilst the total estimated catch is less than the reported landings, almost all of the observed yellowfin tuna was retained (2011-2015 = 93.9%), and so the landings data are highly likely to be a good indicator of the total yellowfin tuna catch. This indicates that yellowfin tuna likely represents approximately 1.6% of the total catch ($61 / 0.939 = 65$; $65 / 39.60 = 1.6\%$).

Albacore tuna – Minor retained

The following section is summarised from ICCAT (2016d).

Albacore tuna is a temperate tuna species widely distributed throughout the Atlantic Ocean and Mediterranean Sea. On the basis of the biological information available for assessment purposes, the existence of three stocks is assumed, with the northern Atlantic stock being separate from the Mediterranean and southern Atlantic stocks.

The most recent assessment of northern Atlantic albacore was undertaken in 2013 (ICCAT 2016d). There is substantial uncertainty on current stock status, since different models and assumptions provide a wide range of B/B_{MSY} and F/F_{MSY} estimates. While the most recent assessment indicated that the stock has remained overfished with SSB below SSB_{MSY} since the mid-1980s, status has improved since the lowest levels around 30% in the late 1990s, and current SSB_{2011} is approximately 94% of SSB at MSY . Corresponding fishing mortality rates have been above F_{MSY} between the mid-1960s and the mid-2000s. Peak relative fishing mortality levels in the order of 2.5 were observed in the mid-1990s and remained below 1 afterwards. However, the F_{2011}/F_{MSY} ratio is now 0.72, indicating that overfishing is not occurring.

The total annual catch of northern Atlantic albacore tuna in all fisheries over the last five years has remained about 23,000 t (ICCAT 2016d). The landings in the swordfish longline fleet averaged 28 t for the 2011-2015 period (Table 4

Table 4), representing approximately 0.1% of the total catch. It is noted that the estimated total annual (retained + discarded) catch of albacore tuna based on scaled observer data is 16.4 t (Table 6), which is less than the reported landings. However, almost all of the observed albacore tuna was retained (2011-2015 = 91.6%), and so the landings data are highly likely to be a good indicator of the total catch. This indicates that albacore tuna likely represents approximately 0.8% of the total catch ($28 / 0.916 = 31$; $31 / 39.60 = 0.8\%$)

3.6.2.2 Bycatch species

Blue shark – Main bycatch

The following section is summarised from ICCAT (2015e).

Blue shark is a large pelagic shark with a global distribution in tropical to temperate waters. It is a placental viviparous species and has an average litter size of 35 pups. Tagging studies have suggested that they exhibit large-scale migratory behaviour and periodic vertical movement, but numerous aspects of their biology is still poorly understood or completely unknown, which contributes to uncertainty in quantitative and qualitative assessments.

The most recent assessment of the North Atlantic blue shark stock was undertaken in 2015 (ICCAT 2015e). All scenarios considered with the Bayesian surplus production model and the integrated model indicated that the stock was not overfished ($B_{2013}/B_{MSY} = 1.35-3.45$) and that overfishing was not occurring ($F_{2013}/F_{MSY} = 0.04-0.75$); a similar status was also concluded in the 2008 stock assessment. However, it was acknowledged that was a high level of uncertainty in data inputs and model structural assumptions, by virtue of which the possibility of the stock being overfished and overfishing occurring could not be ruled out.

Landings data for blue shark do not provide a good indication of total catch in the swordfish longline fishery, and so the catch in the longline fishery was estimated through looking at scaled observer data; these indicate that the total annual average catch of blue shark in the fishery over the period 2011-2015 was approximately 1,512 t (Table 6), although the highest

estimated annual catch of 2,371 t was from 2013, when observer coverage was lowest (1.5%). The average total catch of blue shark from the North Atlantic stock for 2011-2015, as reported to ICCAT¹, was 39,101 t, and so the catch in the swordfish longline fishery is equivalent to approximately 3.9% of the total over that period. Campana et al. (2015) noted that the persistence of blue sharks to this point is partly attributable to their productivity relative to other sharks species, the fact that few mature females are caught either in Canadian or American waters, and the relatively low overall Canadian contribution to overall population mortality. Also, Campana et al. (2016) looked at post-hooking mortality rates for blue shark, and the overall non-landed fishing mortality of blue sharks captured in the pelagic longline fishery was estimated at 23.1% (95% CI: 16–30%), which was found to be lower than that of porbeagle and mako sharks. Campana et al. (2015) concluded that, at present, fishing-related sources of mortality of blue shark in Canadian waters appear to be sustainable.

Porbeagle shark – Minor bycatch

When the swordfish longline fishery was first certified, a Condition of Certification was set regarding porbeagle shark; this was closed at the Year 4 audit (Knapman et al. 2017), with a detailed review of porbeagle management in the swordfish fishery having been provided.

Porbeagle was assessed as 'endangered' by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 2004, but in 2006 the Governor in Council made the decision to not list porbeagle under Schedule 1 of SARA. It was then placed on Appendix II of CITES in 2013, and the directed fishery for porbeagle in Canadian waters was closed in 2013 (DFO 2016j). Porbeagle was reassessed by COSEWIC as 'endangered' in 2014 (COSEWIC 2014) and the Department is currently undertaking a process to determine whether or not the species should now be listed under SARA.

The latest stock assessment information for porbeagle was presented by Campana et al. (2015). The authors ran four variants of a forward projecting, age and sex-structured life history model, fit to catch-at-length and catch per unit effort data to the end of 2008, although some information including catch and discards was updated to the end of 2011. The four variants of the population model differed in their assumed productivity, but all variants of the model predicted porbeagle recovery to 20% of spawning stock numbers (SSN20%) before 2014 if the human-induced mortality rate was kept at or below 4% of the vulnerable biomass (Campana et al., 2015).

Hooking mortality and post-release mortality estimates for porbeagle have been assessed by on-board observers of Canadian fishing vessels since 2010 and were reported by DFO (2015). Accounting for landings, capture mortality and post-release mortality, the total annual mortality of porbeagle from all commercial fishing activities in Canadian waters from 2009 to 2014 has averaged 107 t (range 88 – 164 t); this represents a mortality rate of approximately 2% (DFO 2015).

Although, following Campana et al. (2015), these catch and mortality data indicate that the porbeagle population status is now highly likely to be above the SSN20% level, this cannot be confirmed in the absence of an updated assessment for porbeagle. A fishing survey will reportedly be undertaken in summer 2017 in an effort to gather sufficient data to support an assessment process (T. Atkinson, pers. comm.).

The landings data for porbeagle shark in the swordfish longline fishery show that there has been a significant decline in landings over recent years, with just 503 kg retained in 2015 (Table 4). Using scaled observer data, it is estimated that the total annual average catch of

¹ ICCAT statistical database: https://www.iccat.int/Data/t1nc_20161114.rar

porbeagle shark in the swordfish longline fishery over the period 2011-2015 was 19.8 t (Table 6).

Common thresher shark – Minor bycatch

The common thresher shark (*Alopias vulpinus*) is virtually a circumglobal species, with a noted tolerance for cold waters. Its life-history characteristics (2-4 pups per litter; 8-14 year generation period) make it vulnerable to rapid depletion where targeted (Goldman et al. 2009).

The Assessment Team did not identify a specific stock assessment for common thresher shark in the Northwest Atlantic, but Young et al. (2015) undertook a status review for common thresher shark and bigeye thresher shark (*Alopias superciliosus*). Based on analysis of logbook data and observer data for the Northwest and Central Atlantic, it was determined that the population of common thresher shark suffered a decline prior to 1990, but has likely stabilised in the region since 1990. Observer data indicate that the population has increased since 1992 (Young et al. 2015).

There were no landings of thresher shark in the swordfish longline fishery from 2011-2015, and all individuals recorded in the observer data were returned (Table 4). Using scaled observer data, though, it is estimated that the total annual average catch of thresher shark in the fishery over the period was 9.3 t (Table 6). 99.5% of the landings recorded in the ICCAT database from the northwest Atlantic for the 2011-2015 period were of "*Alopias* spp."², but based on species distribution as reported by the IUCN^{3,4}, it is expected that, in this area, more of the catches are of *A. vulpinus* than *A. superciliosus*. The average total catch of thresher sharks as reported to ICCAT for the Northwest Atlantic was 128 t, and so the catch in the swordfish longline fishery is equivalent to approximately 7% of the total over that period.

White marlin – Minor bycatch

The following section is summarised from ICCAT (2012b).

White marlin inhabits the surface mixed layer of the open ocean. White marlin spawning areas occur mainly in the tropical western North and South Atlantic, predominantly in the same offshore locations in their normal range.

There is considerable uncertainty in the results of the 2012 white marlin stock assessment, but they indicated that whilst the stock remains overfished, most likely it is not undergoing overfishing. Relative fishing mortality has been declining over the last ten years and is now most likely to be below F_{MSY} ; although relative biomass has probably stopped declining over the last ten years, it still remains well below B_{MSY} .

Historic catch data for white marlin are complicated by misidentification and inclusion of a variable amount of roundscale spearfish in the white marlin data, but the total catch of white marlin in all fisheries in 2013 and 2014 was estimated to be 376 t and 361 t, respectively (ICCAT 2012b). ICCAT set a 400 t TAC for the 2013-2015 period. The landings in the swordfish longline fleet averaged 2.5 t for the 2011-2015 period (Table 4), but the estimated total annual (retained + discarded) catch of white marlin in the fishery, based on scaled observer data, was 8.4 t (Table 6). This figure represents just over 2% of the total catch and TAC of white marlin.

² ICCAT statistical database: https://www.iccat.int/Data/t1nc_20161114.rar

³ IUCN reported distribution for *A. superciliosus*: <http://maps.iucnredlist.org/map.html?id=161696>

⁴ IUCN reported distribution for *A. vulpinus*: <http://maps.iucnredlist.org/map.html?id=39339>

3.6.3 Endangered, Threatened and Protected (ETP) species

Species that need to be considered against the endangered, threatened and protected (ETP) performance indicators include any that are protected under international law, as well as those listed under the Canadian Species At Risk Act (SARA 2002). The listing of a species by COSEWIC (Committee on the Status of Endangered Wildlife in Canada) does not result in a species being considered under the ETP species performance indicators for MSC assessments.

Both leatherback turtles (*Dermochelys coriacea*) and loggerhead sea turtles (*Caretta caretta*) are taken in the swordfish longline fishery (Table 6), and these are listed as 'endangered' on Schedule 1 of SARA (the listing of loggerhead sea turtle was confirmed in May 2017 – GoC 2017). Both turtle species are also listed on CITES Appendix I. More information on the interactions or potential interactions between the fishery and these species is provided in the following sections.

Leatherback turtle

The IUCN status assessment for leatherback turtle was recently updated, with subpopulations of the species being listed individually for the first time (Wallace et al. 2013). Tiwari et al. (2013) undertook the assessment for the Northwest Atlantic leatherback turtle subpopulation, which is of relevance to the swordfish logline fishery; they stated:

"The Northwest Atlantic leatherback nests in the southeastern U.S.A., throughout the mainland and insular Caribbean, and the Guiana Shield, and marine habitats extend throughout the North Atlantic, including the Gulf of Mexico, north beyond 50N, into the Mediterranean, and across the equator to northwestern Africa. Several genetic nesting stocks have been identified within this subpopulation, but metapopulation dynamics support its designation as a single subpopulation, or regional management unit. Based on long-term time series datasets of abundance—i.e. annual counts of nesting females and nests—this Northwest Atlantic subpopulation is large (>50,000 nests yr⁻¹, ~10,000 females yr⁻¹) and has increased by 20.6% over the past three generations, and is projected to increase to >180,000 nests yr⁻¹ in the next generation (by 2040). Therefore, the Northwest Atlantic subpopulation is considered Least Concern under current IUCN Red List Criteria."

Leatherback turtles can be found throughout Canadian Atlantic waters, but the animals are often concentrated in what are thought to be important foraging habitat. Satellite telemetry data suggest that key concentrations occur in deep water outside the 1000 m contour off the southern part of the Scotian Shelf, around the northern tip of Nova Scotia into the southern Gulf of St. Lawrence, and to a lesser extent off the south coast of Newfoundland in Placentia Bay (O'Boyle 2012).

The recovery strategy for leatherback turtles (LTRT 2006) identified entanglement in fishing gear as the main threat to leatherback turtles in Canadian waters, mainly in pelagic longline gear along the edge of the Scotian Shelf and further offshore, but also in coastal fishing gear. Because entanglement is a relatively rare event, an estimate of leatherback turtle captures based on the scaled observer data (Table 6) appears unlikely to be reliable, in particular in years when observer coverage is particularly low (i.e., 2013). However, O'Boyle (2012) reported that, based on an analysis by Hanke et al. (2011), the encounter rate in swordfish longline fishery is estimated to have declined from 120 – 190 per year prior to 2006 to 60 – 90 per year since then.

O'Boyle (2012) provided an estimate of 21- 49% mortality following longline interactions based on the available information and expert opinion, although leatherback mortality in the similar US fishery is estimated at 21%, and recent data from the Canadian observer

programme shows that of the 29 leatherback turtles observed captured in the fishery, nine (31%) were released 'alive injured', with only one individual being recorded 'dead' upon release (Table 7, DFO pers. comm.).

If the worst case is assumed (i.e., 90 turtles entangled and 49% mortality) then the swordfish longline fishery would result in 44 leatherback turtles per year suffering mortality, equivalent to 0.13% of the adult population (estimated to be 33,810 – Tiwari et al. 2013).

Table 7: Observer data for leatherback turtle interactions with the swordfish longline fishery (data in numbers of animals) (DFO, pers. comm.).

Year	Alive Uninjured	Alive Injured	Unable to Determine	Dead	Total
2011	3	0	0	0	3
2012	6	1	0	1	8
2013	4	0	0	0	4
2014	0	5	0	0	5
2015	7	1	1	0	9
Total	20	7	1	1	29

Various measures are employed in the swordfish longline fishery to minimise lethal interactions with turtle species, including through the use of circle hooks and shallow setting that allows turtles to reach the surface if they take the bait or are entangled, as well as through the mandatory requirement for swordfish skippers to be trained in and carry turtle de-hooking equipment (DFO 2016h).

Loggerhead sea turtle

At the time the swordfish longline fishery was initially certified in 2012, information was available on the estimated number of catches of loggerhead sea turtles in the fishery, and on their potential fate, together with the potential impact of the fishery on the northwest Atlantic loggerhead sea turtle population .

According to the DFO Recovery Potential Assessment for loggerhead sea turtle (DFO 2010), the swordfish longline fishery interacted with an estimated average of 1,200 loggerhead sea turtles annually between 2002 and 2008. While there is mandatory release (DFO 2016h), post hooking mortality does occur at a range of between 20% and 45%, such that 200-500 loggerhead sea turtles were estimated to die annually in the Canadian longline fishery. Because the loggerhead sea turtles caught in the fishery are oceanic and neritic juveniles, applying survivorship rates provided in the US Recovery Plan (NMFS & USFWS 2008), this equates to 5-15 adult female equivalent mortalities of oceanic juveniles or 47-118 nesting female equivalents of neritic juveniles (range of 5 – 118 nesting female equivalent mortalities). In comparison, the estimated total annual adult equivalent mortality for loggerhead sea turtles in all fisheries was estimated to be 12,434 animals (NMFS & USFWS 2008), such that the annual take in the swordfish longline fishery in terms of adult equivalent values was estimated to equate to just 0.04 - 0.95% of the total fishery impact.

When the swordfish longline fishery was first certified, a Condition of Certification was set regarding loggerhead sea turtle interactions. As has been reported annually through the subsequent annual audits, DFO has been undertaking a turtle tagging and post-capture survival monitoring study in an attempt to more reliably establish post-capture mortality rates

in loggerhead sea turtles following capture in the swordfish longline fishery. An update was provided to the Year 4 audit team, and this was discussed in the audit report (Knapman et al. 2014) in detail. Unfortunately, the study has yet to be completed, in part because the tags used have not been as reliable as hoped, and in part because fishery-turtle interactions were relatively infrequent in 2016 (DFO 2016f).

Table 8: Observer data for loggerhead sea turtle interactions with the swordfish longline fishery (data in numbers of animals) (DFO, pers. comm.).

Year	Alive Uninjured	Alive Injured	Unable to Determine	Dead	Total
2011	1	0	0	0	1
2012	68	44	2	0	114
2013	1	0	0	0	1
2014	6	7	0	0	13
2015	3	1	0	0	4
Total	79	52	2	0	133

In terms of post-hooking mortality, IMM (2012) stated: “Based on the two years with high observer coverage (2001 & 2002), approximately 75% were released alive and uninjured, approximately 20% were released alive and injured, and 2% were released dead or observers were unable to determine their release status (Javitech 2003).” More recent observer data (Table 8) indicate that a greater proportion of the released animals are released ‘alive injured’ than previously.

Nevertheless, importantly, the IUCN Redlist assessment for loggerhead sea was updated during the current certification period (Ceriani 2015). This latest status assessment now lists loggerhead sea turtle subpopulations individually, rather than simply showing an overall global status for the species. The Northwest Atlantic subpopulation of loggerhead sea turtle (i.e., the population of relevance to the swordfish longline fishery) is listed as being ‘Least Concern’, with the available long-term series of annual nest counts (used as an index of population abundance) showing an overall increase over the past three generations. The ‘Least Concern’ status reflects that the Northwest Atlantic subpopulation did not trigger any of the thresholds and options for a threatened category under criteria A (Declining population – past, present and/or projected), B (Geographic range size, and fragmentation, decline or fluctuations), C (Small population size and fragmentation, decline, or fluctuations), or D (Very small population or very restricted distribution).

A further recent review of loggerhead sea turtles in the Northwest Atlantic by Chapman & Seminoff (2016) reported that, “With the exception of lower totals for 2014 in Georgia and the Carolinas, the last five years appear to have a positive trend in all areas. Florida’s wealth of data show a dip in the loggerhead sea population around the early 2000’s but also a definite rebound in the past decade.”

3.6.4 Habitats

The areas in which the fishery operates (i.e., Canadian Atlantic waters, primarily off the Scotian Shelf) have been mapped with moderate to high levels of detail (e.g., Brown et al. 2011, C-NLOPB 2014, Kostylev et al. 2001, Kostylev et al. 2004), including with respect to sensitive habitats such as deep water corals (Kenchington et al. 2010, Kenchington et al. 2016)). However, the swordfish longline fishery is a surface drifting, pelagic fishery,

operating in deep water and with no bottom contact. As such, the Assessment Team considers that significant habitat impacts are extremely unlikely.

3.6.5 Ecosystem

As noted in Section 3.4, the swordfish longline fishery follows the seasonal migration of swordfish and tuna through Canadian waters during summer and fall as they move into the productive waters of the continental shelf slope and shelf basins. The fishery usually starts in April and can run through to December in any year. The longline fishing effort generally progresses from west to east and back again and from offshore to inshore along the edge of the continental shelf (see Figure 1). Given the geographical extent of the fishery (Canadian as well as international waters), and the range of the target species, the fishery is considered to occur within the pelagic ecosystem of the Northwest Atlantic.

The Scotian Slope has been defined as an ecologically and biologically significant area (EBSA). Designation as an EBSA does not afford an area any special legal status, but it does draw attention to an area's high ecological or biological significance, and may promote the application of higher standards of management (DFO 2009d). Identification of an area as an EBSA also indicates that if the area were disturbed or disrupted, the ecological consequences would be greater than an equal disturbance of most other areas.

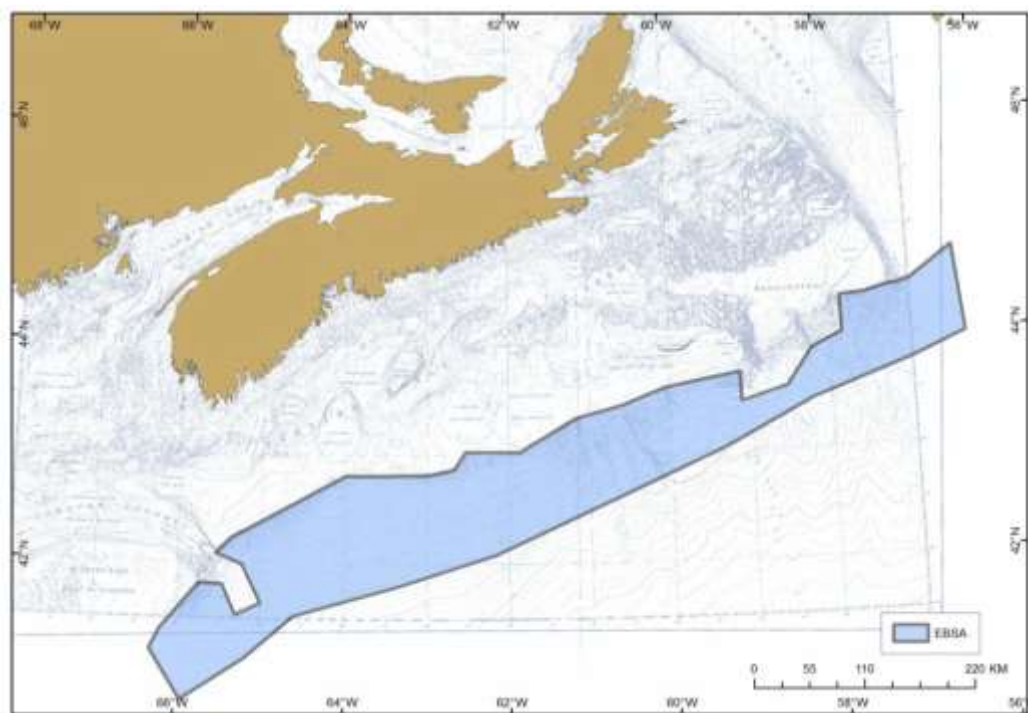


Figure 7. The Scotian slope EBSA (72,800 km²). From King et al. (2016).

The Scotian Slope EBSA includes the entire Scotian Slope, which is roughly defined as the area between 200 m and 3000 m along the edge of the shelf. It was identified for reasons including that the steep topography along the shelf break causes enhanced vertical mixing resulting in high primary productivity, and because it forms a migration route for large pelagic fishes (e.g., sharks, tunas, swordfish) (Figure 7, and King et al. 2016). This is a key area of operation for the swordfish longline fishery (Figure 1).

On the Scotian Shelf itself, Emerald Basin and the Scotian Gulf has also been identified as an EBSA (King et al. 2016). Emerald Basin is located in the central portion of the Scotian

Shelf and contains the deepest point on the shelf at 291 m, while the Scotian Gulf is formed from the depression between Emerald Bank and LaHave Bank. The boundary of this large EBSA is mainly based on the 200 m isobath, which is typically used to define basins in the bioregion. It was identified for reasons including globally unique concentrations of a Hexactinellid sponge, its unique temperature and salinity regime that results in it containing warmer and saltier water than the rest of the Scotian Shelf, the possibility that it is a nursery area for porbeagle shark, and because it forms a summer residence for tuna and swordfish (Figure 8, and King et al. 2016). As with the Scotian slope area, Emerald Basin and the Scotian Gulf are key areas of operation for the swordfish longline fishery (Figure 1).

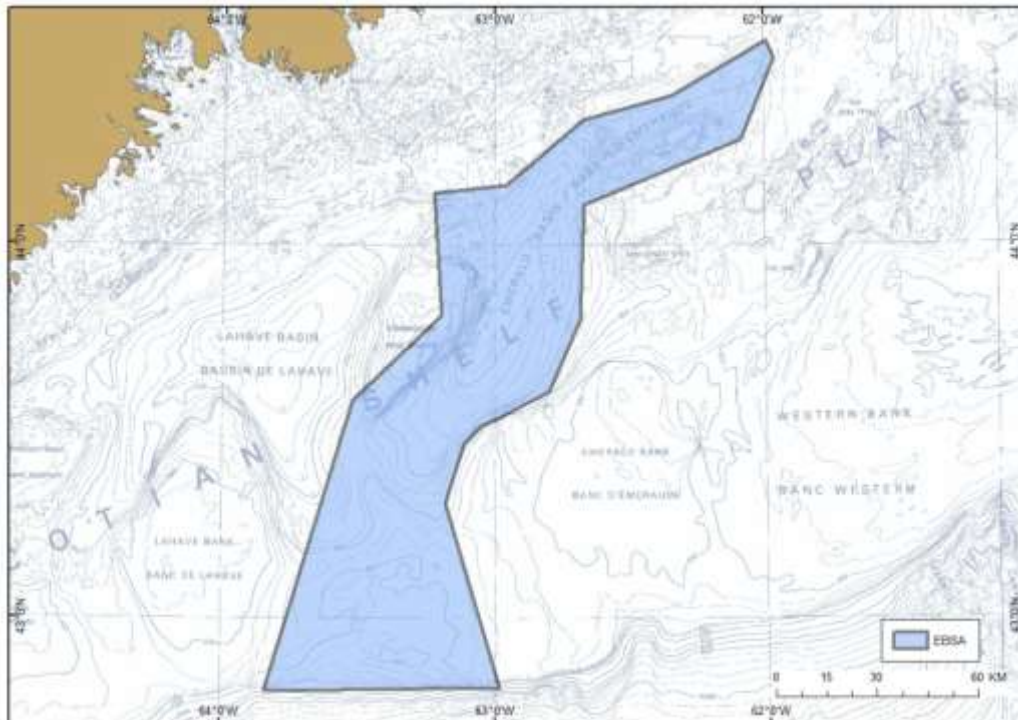


Figure 8. The Emerald Basin and the Scotian Gulf EBSA (8,513 km²). From King et al. (2016).

The MSC defines 'key ecosystem elements' as *"the features of an ecosystem considered as being most crucial to giving the ecosystem its characteristic nature and dynamics, and are considered relative to the scale and intensity of the fishery. They are features most crucial to maintaining the integrity of its structure and functions and the key determinants of the ecosystem resilience and productivity"* (CR v1.3, CB3.17.3, MSC 2013a).

Catches in the swordfish longline fishery are comprised almost exclusively of large pelagic predators, as the fishery targets swordfish, but also takes tuna, sharks and marlins (e.g., Table 5). These species comprise important, high trophic level predators within the ecosystem. There is some evidence that significant declines in marine top predators can result in trophic cascades (e.g., Myers et al. 2007, Heithaus et al. 2008, Baum & Worm 2009), and so the key ecosystem element of relevance to the swordfish longline fishery is considered to be trophic structure and function within the Northwest Atlantic pelagic ecosystem.

It is noted that the original certification report for the swordfish longline fishery (IMM 2012) included a detailed discussion on issues and evidence around trophic impacts resulting from fishing on high trophic level predators; readers are encouraged to review that report for further information.

3.7 Principle Three: Management System Background

The intent of Principle Three (P3) is to ensure that there is an institutional and operational framework appropriate to the size and scale of the UoA for implementing Principles 1 and 2, and that this framework is capable of delivering sustainable fisheries in accordance with the outcomes articulated in these Principles.

In the following sections a description of the broad, high-level context of the fishery management system and the fishery specific management system is provided with the intent of supporting the scoring rationales used in Appendix 1 of this report.

3.7.1 Area of operation of the UoA

To assess the highly migratory swordfish stocks and manage fisheries on them, ICCAT uses three distinct management units: North Atlantic, South Atlantic and Mediterranean Sea. The North West Atlantic Canada swordfish longline fishery is concentrated within the Atlantic Canadian 200 mile EEZ and international waters within the ICCAT North Atlantic management unit (SWO-N) (North of 5°N and west of 30°W), see Figure 9.

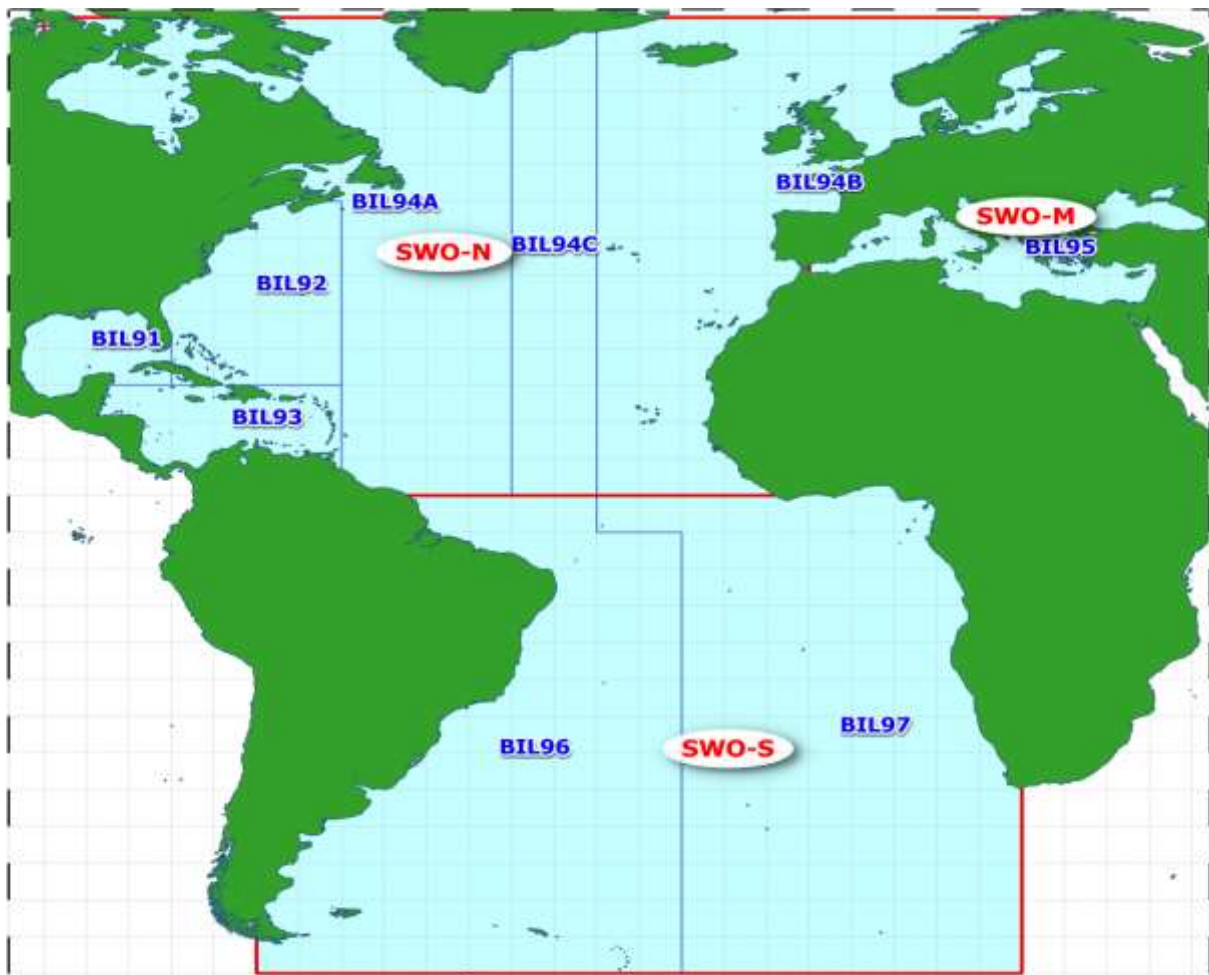


Figure 9. ICATT swordfish stock management units in the Atlantic Ocean - Northern stock (SWO-N), Southern stock (SWO-S), Mediterranean Stock (SWO-M). Sub Areas BIL91 – 97 are “Sampling Areas” from within which fisheries statistics are gathered from ICATT Contracting Parties. Source: ICCAT, 2016 https://www.iccat.int/Data/ICCAT_maps.pdf.

3.7.2 Jurisdiction

ICCAT is an inter-governmental RFMO responsible for the conservation of tunas and tuna-like species in the Atlantic Ocean and Mediterranean Sea, including the EEZs of all coastal states. ICCAT was established in 1966 in accordance with the International Convention for the Conservation of Atlantic Tunas (ICCAT 2007). The organisation's secretariat is based in Madrid, Spain.

The Commission is open to membership from any government that is a member of the United Nations (UN), any specialized UN agency, or any inter-governmental economic integration organization constituted by States that have transferred to it competence over the matters governed by the ICCAT Convention (e.g. the EU). To date ICCAT has 51 Contracting Parties, including Canada, which was one of the founding members <http://www.iccat.es/en/contracting.htm>.

The Commission has also created a special status known as Cooperating Non-Contracting Party, Entity or Fishing Entity. As such they have many of the same obligations, and are entitled to many of the same privileges, as Contracting Parties. There are presently four countries with this status – Bolivia, Suriname, Chinese Taipei and Guyana.

ICCAT continues to encourage countries or entities to become Contracting Parties or Cooperating Non-Contracting Parties. These efforts have been successful as shown by increased membership and participation over recent years, e.g. since the initial MSC assessment of the fishery, 13 new Contracting Parties have joined ICCAT.

ICCAT has no enforcement capacity of its own. In common with other RFMOs, it relies on its member countries to implement management measures domestically, through suitable harvest control tools that will allow the stated objectives for the management of the overall fishery to be met.

Within the Canadian EEZ, the responsibility for the management of fisheries resides with the federal government. The federal Minister of Fisheries and Oceans has the ultimate responsibility for the fishery and his/her authority is delegated to officials through the organisational structure of the DFO. The Resource Management Branch of DFO in Halifax, Nova Scotia, takes the lead on the swordfish fishery.

3.7.3 Legal and policy framework

ICCAT

The International Convention for the Conservation of Atlantic Tunas is the formal document that establishes the international legal and administrative structure for the management of tuna and tuna-like stocks in the Atlantic. The Convention has been amended five times, the last time in 2007. A Convention Amendment Working Group is presently reviewing the Convention (ICCAT, 2016b) although when the next amendment is expected is not yet clear. The Convention, together with ICCAT instruments, such as the ICCAT Rules of Procedure and ICCAT Financial Regulations are referred to as "ICCAT Basic Texts", (ICCAT, 2007).

The Convention establishes that ICCAT is the only organization that can undertake the range of work required for the study and management of tunas and tuna-like fishes in the Atlantic. ICCAT is responsible for the coordination of research and data collection and analysis by Contracting Parties and Cooperating Non-Contracting Parties. The Contracting Parties' research focuses on the effects of fishing on target fish stock abundance and data collection and analysis on current conditions and trends on target fish stocks and other fish species caught incidentally, such as sharks (www.iccat.es).

The Commission has set up a number of subsidiary bodies that analyze different types of information and refer their conclusions and recommendations back to the Commission for final decision-making. The “ICCAT Manual” describes the function and role of the various bodies within the ICCAT structure (<http://www.iccat.int/en/ICCATManual.asp>).

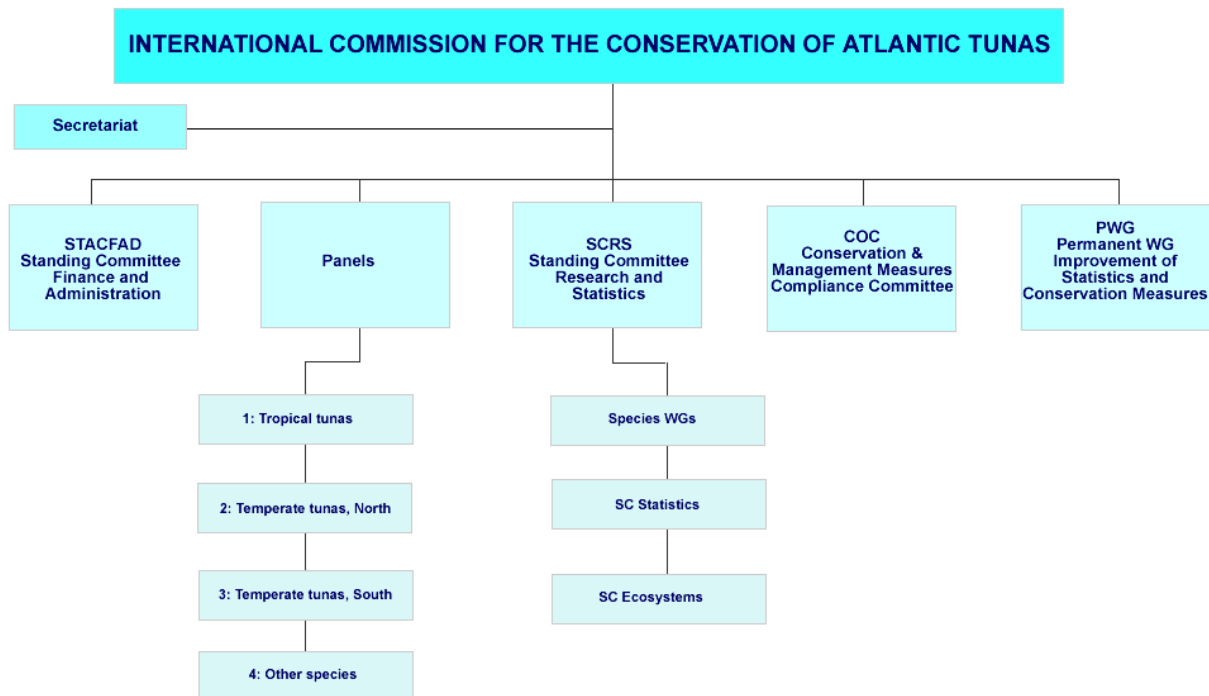


Figure 10. A diagram of the ICCAT organisational structure. Source <http://www.iccat.int/en/ICCATManual.asp>

The Commission is made up of all the Contracting Parties. Each Contracting Party is represented on the Commission by not more than three delegates. Decisions of the Commission are taken by the majority of the Contracting Parties, with each Contracting Party having one vote. Two thirds of the Contracting Parties constitute a quorum. The Commission meets once every two years, although special meetings may be called at any time at the request of a majority of Contracting Parties. At each regular meeting, the Commission elects a Chairman, Vice Chairman and second Vice Chairman who are elected for not more than one term.

The Commission uses two types of instrument to implement their management policy: Recommendations and Resolutions. Recommendations are binding, whereas, Resolutions are not. Recommendations become effective 6 months after the date of notification by the Commission, unless a Contracting Party registers an objection.

The Secretariat Coordinates and facilitates the work of the Commission. This includes managing the Commission's budget, coordinating research programs, maintaining databases, preparing publications and organizing the meetings of the Commission and subsidiary bodies. The Secretariat is based in Madrid, Spain.

The Standing Committee on Finance and Administration reviews all financial and administrative matters and prepares a budget.

The Standing Committee on Research and Statistics (SCRS), on which each member country can be represented, recommends to the Commission all policy and procedures for the collection, compilation, analysis and dissemination of fishery statistics. It is the SCRS' task to assure that the Commission has available complete and current statistics concerning fishing activities in the Convention area as well as biological information on the stocks that are fished. The Committee also coordinates various national research activities, develops plans for special international cooperative research programs, carries out stock assessments, and advises the Commission on the need for specific conservation and management measures. The SCRS is composed of other subsidiary bodies that examine different species or different topics: These are the Species Groups (working groups that assess the status of the various stocks), and two Sub-Committees: Statistics and Ecosystems.

Four Panels are responsible for keeping under review the species, group of species, or geographic area under its purview: Panel 1: Tropical Tunas (yellowfin, skipjack and bigeye); Panel 2: Northern Temperate Tunas (albacore and bluefin); Panel 3: Southern Temperate Tunas (albacore and southern bluefin); and, Panel 4: Other species (swordfish, billfishes, sharks). The Panels review scientific and other information and make recommendations for joint action by the Contracting Parties aimed at maintaining the stocks at levels that will permit maximum sustainable catches. The Panels may also recommend to the Commission studies and investigations necessary for obtaining information relating to its species, group of species, or geographic area, as well as the co-ordination of research programs by the Contracting Parties.

Compliance matters are reviewed by two different bodies: The Conservation and Management Measures Compliance Committee (reviews matters related to Contracting Parties), and the Permanent Working Group on ICCAT Statistics and Conservation Measures (reviews matters related to Non-contracting Parties).

Through Article IX of the Convention, the Contracting Parties to the ICCAT have agreed to take all action necessary to ensure the enforcement of the Convention, to report biennially on these actions and provide statistical, biological and other scientific information needed by the Commission to fulfill the purposes of the Convention.

The Commission meets at least every 2 years to present and review the work of the Commission's various committees and working groups and to determine management measures, including quota, for the various fish stocks it manages.

Canada

The legislative authority for the management of seacoast and inland fisheries in Canada falls under the jurisdiction of the Parliament of Canada pursuant to the Constitution Act, 1867 (Government of Canada 1867).

There are several pieces of legislation that apply to fishing, the major one being the Fisheries Act, 1985. This Act grants wide discretionary authority to the Minister of Fisheries and Oceans and provides for the enactment of regulations respecting the management of the fishery. The Minister's authority is delegated to officials through the organisational structure of DFO. The Atlantic Fishery Regulations, 1985 and the Fishery (General) Regulations are the main regulatory instruments governing the fishery. Section 35(1) of the Constitution Act, 1982 (Government of Canada 1982) recognises and affirms existing Aboriginal and treaty rights and any legislation governing the fishery may not infringe on those rights.

In addition to the legislative framework, there are a number of policy initiatives that have been developed to guide decision-making in the management of fisheries in Canada.

Relevant legislative instruments and policy documents are outlined in Table 9, below.

Table 9. Principal Acts and policy documents

Principal Acts and Policy Documents	Description
The Fisheries Act, 1985	Provides absolute discretion to the Minister for the management of fisheries and for the establishment of fishing licences, regulations, reporting requirements, powers of fishery officers, protection of fish habitat and pollution prevention.
The Atlantic Fishery Regulations, 1985	Prescribes conditions for the operation of the fishery including seasons, closures, management and conservation measures, etc. Variation Orders are used to alter conditions and to shorten or lengthen the fishing season as appropriate.
The Fishery (General) Regulations 1993	Provides for the issue of licences and the authority to specify conditions in a fishing licence, e.g. allocations, vessel monitoring systems, hail-in/hail-out requirement, observer coverage, dockside monitoring, etc.
The Species at Risk Act (SARA) 2002	Authorizes actions aimed at managing species of special concern, preventing the extirpation or extinction of endangered marine species, or promoting their recovery.
The Oceans Act 1996	Prescribes the Canadian oceans management strategy, including sustainable development, the precautionary approach, the implementation of integrated management of marine activities and the designation of Marine Protected Areas (MPAs).
The Aboriginal Fisheries Strategy (DFO 1992)	Seeks to provide for the effective management and regulation of fishing by Aboriginal groups through the negotiation of mutually acceptable and time-limited fisheries agreements between DFO and Aboriginal groups.
Atlantic Fisheries Policy Review – A Policy Framework for the Management of Fisheries on Canada’s Atlantic Coast (DFO 2004)	Presents objectives to guide decision-making in Atlantic fisheries. It places conservation of the resource as the priority, sets the path for greater industry self-reliance, establishes transparent rules-based processes for decision-making and encourages a greater role for resource users and others.
Sustainable Fisheries Framework (SFF) (DFO 2009a)	Focuses on the need to incorporate the precautionary and ecosystem approaches to fishery management.
Policy on Managing Bycatch (DFO 2013)	Aims to address and take account of total catch, including retained and non-retained species bycatch in all fisheries management plans.

Canada is also required to comply with constitutional legislation such as the Charter of

Rights and Freedoms, The Financial Administration Act and the Canadian Environmental Assessment Act, among others. There is also a large body of common law, such as administrative and aboriginal law, which has a major effect on DFO's programs and activities

The regulations noted in

Table 9 create the legal framework for the management, licensing and registration of participants of fisheries in Canada. They also provide an administrative and court sanction system with fines ranging from low to as high as hundreds of thousands of dollars and even jail time in extreme cases. The court also has the discretion to forfeit catch and equipment upon conviction.

3.7.4 Dispute resolution

ICCAT

ICCAT has a tradition of making decisions by consensus and resolving disputes informally, e.g. ICCAT members discuss issues in species panels, approving panel reports and raising relevant issues at Commission sessions providing a full airing of concerns in an effort to avoid disputes. However, in cases where disputes cannot be settled, the ICCAT Convention provides a process of objection allowing individual Contracting Parties to withdraw from endorsing and implementing an ICCAT Recommendation (ICCAT Convention Article VIII). This procedure has been used fairly infrequently in the course of ICCAT's history; 12 times since 1969, with 7 of these being objections raised by two member states with respect to their blue fin tuna allocation.

ICCAT's Conservation and Management Measures Compliance Committee monitors compliance with the Convention and ICCAT Recommendations (ICCAT Recommendations are binding insofar as the Contracting Party agree to implement them domestically). This Committee has the potential to address disputes over implementation of ICCAT Recommendations. While exceeding TAC allocations for North Atlantic swordfish has not generally been a problem, there are examples of catches in excess of TACs for other stocks without limited action or mitigation measures (Spencer et al, 2016).

ICCAT has recognised the need for a more formal dispute settlement procedure for some time and a Working Group on Convention Amendment were tasked with looking at this issue in 2012. At the last ICCAT meeting in 2016 this issue had still not been resolved, the sticking point apparently being on whether dispute settlement procedures would be compulsory or not, i.e., whether procedures could only be instituted jointly by all parties to a dispute or, instead, by a single or number of Contracting Parties (Spencer et al, 2016).

Canada

Regional managers of DFO have a particular role to play in brokering solutions on policy related disputes, with most unresolved disputes being referred to DFO's Regional Director General (RDG) or the Fisheries Minister, for a decision. Generally, DFO avoids legal disputes by obtaining legal advice before the implementation of programs, activities or policies to ensure compliance with applicable legislation prior to implementation.

Unresolved disputes within the Canadian fisheries management system can be, and have been, taken through the Canadian judicial system. Under the Fisheries Act, the Federal Courts Act (1985) provides a mechanism for someone to challenge decisions of administrative bodies or tribunals and be provided with a hearing before a justice of the court.

While there have been no disputes within the swordfish fishery that have needed to use this

mechanism, some of the more notable cases which have include, the “Sparrow”, “Marshall” and “Larocque” decisions. The Sparrow decision (1990) resolved that aboriginal groups have a right to fish for food, societal and ceremonial purposes and that this use-right is surpassed only by conservation of the resource. The Marshall decision stated that Treaties signed in 1760 and 1761 by Mi’kmaq and Maliseet communities include a communal right to hunt, fish and gather in pursuit of a moderate livelihood (Marshall Decision 1999). This decision essentially gave First Nations in the Maritime Provinces the right to fish commercially. The Larocque decision outlawed the use of resource allocations to pay for services provided to, or on behalf of, government without the approval of Parliament (Larocque Decision 2006). The Fisheries Act has since been amended (Bill C-38, June 2012) creating a new section (10) that authorizes the Minister of Fisheries and Oceans to allocate fish for the purpose of financing Scientific and Fisheries Management activities under Joint Project Agreements.

3.7.5 Consultation

ICCAT

ICCAT holds an annual meeting providing the opportunity for member countries to share information concerning management of fisheries with other members. Annual national reports, including local knowledge, are accepted and included in Commission meetings.

ICCAT meetings are advertised and open to the public providing an opportunity for all interested and affected parties to be involved.

The ICCAT Convention (Article XI) states that the Commission may invite any appropriate international organization and any non-member Government that is a member of the UN or of any Specialized Agency to send observers to meetings of the Commission and its subsidiary bodies.

While there is no explicit provision made in the ICCAT Convention for the participation of NGOs in meetings they are explicitly mentioned and taken into account within “Guidelines and Criteria for Granting Observer Status at ICCAT Meetings” (ICCAT 2005). All NGOs which support the objectives of ICCAT and with a demonstrated interest in the species under the purview of ICCAT are eligible to participate as an observer in all but extraordinary meetings held in executive sessions or meetings of Heads of Delegations. Application has to be made through the Secretariat at least 50 days in advance of the meeting. CPCs are notified and given opportunity to object. Applications are accepted unless one-third of the Contracting Parties object.

Observers are not allowed to vote, but they can, upon invitation by the chair, make an oral statement during the meeting and distribute documents at meetings through the Secretariat. Observers may be required to pay a fee to contribute to additional expenses generated by their participation.

Canada

Canada has established two main bodies for consulting with industry and other stakeholders on positions at ICCAT and domestic management measures of the Canadian swordfish fisheries. The Atlantic Large Pelagic Advisory Committee (ALPAC) is the main body for both industry and the DFO to work collaboratively on the management of large pelagic species (swordfish, albacore, bigeye, yellowfin, blue fin and sharks) in Atlantic Canada. The Committee is chaired by DFO and, aside from the representation of most divisions of DFO, membership of the ALPAC group is made up of industry stakeholders that include: fish harvesters; processors; representatives from each of the Atlantic provincial governments

and Quebec. The meetings are open to the public and press, unless a majority of Committee members say otherwise. Observers may take part in the discussions if invited to by the Chair (DFO, 2002). As indicated in minutes of the meeting (DFO, 2016a) environmental non-government organisations (ENGOS) actively participate in the meetings. No formal voting procedures are established. The committee seeks to operate on a consensus basis.

The ALPAC terms of reference confirm there will be at least one meeting a year and the IFMP (DFO 2013) indicates the committee normally meets at least twice a year: in the spring, when the committee reviews the fisheries from the previous year and discuss any issues/concerns and recommendations for the domestic management of the fisheries and the setting of a Conservation Harvesting Plan (CHP), i.e. the quota allocation and operational guidelines within which the fishery operates (DFO 2016c); and, in the autumn, in advance of the annual ICCAT meeting, DFO meets with ALPAC members to discuss and adopt Canadian positions at ICCAT. Fleet representatives for the longline and harpoon swordfish fleets are actively engaged in the ALPAC process.

ALPAC may also establish ad hoc subcommittees and/or working groups to assess specific policy options and management measures. ALPAC has established a small advisory group that meets several times per year in order to provide strategic input into the Canadian positions and recommendations for the annual meetings of ICCAT (DFO 2013). The sub-group is made up of a select number of large pelagic fleet representatives including representatives from both the swordfish pelagic longline and harpoon fleets.

An “Ecosystem Working Group” was initiated in the spring of 2010 to provide advice to ALPAC and DFO with respect to the implementation of an “Ecosystem Approach to Management (EAM) (DFO, 2009c) in the various large pelagic fisheries in Atlantic Canada. Both of the swordfish fleets, pelagic longline and harpoon, were represented on the working group (DFO 2013). The group has not re-convened since.

The Scotia Fundy Large Pelagics Advisory Committee (SFLPAC) is described by DFO as “the second tier” government-industry consultative group (DFO, 2013) that meets at least once a year to discuss Canadian East coast large pelagic fisheries issues and provide input and advice to DFO on their management. Additional meetings may be held if required. This Committee serves as the main regional consultative forum. The Committee is chaired by DFO with other regional DFO staff participating from various DFO Divisions, representatives from Scotia-Fundy based groups related to the large pelagics fisheries, i.e. licence holders for all relevant gear sectors, aboriginal groups, processors, Nova Scotia and New Brunswick provincial governments and regionally based ENGOS also participate (DFO, 2014).

The Committee provides recommendations and advice on Maritimes (Scotia-Fundy) regional policy issues related to the large pelagic fisheries as well as annual CHPs, regulatory measures, fishing seasons, licensing policies, size limitations, by-catch provisions, gear restrictions and other aspects of the IFMP that may arise. Ad hoc sub-committees / working groups can be established to review specific policy and management issues. Separate working groups for tunas, swordfish and shark have been established. No formal voting procedures are established. The committee seeks to operate on a consensus basis and when consensus is not possible, the majority opinion is noted as well as outstanding objections (DFO 2014).

While not directly related to the swordfish fishery, DFO Maritimes Region and a group of regional and national Environmental Non Governmental Organisations (ENGOS) – the Ecology Action Centre, World Wildlife Fund, Canadian Wildlife Federation and Canadian Parks and Wilderness Society - have established a “Dialogue Forum” to “...*facilitate information exchange, relationship building and dialogue on strategic policy issues of relevance regarding the sustainable development and conservation of Canada’s marine*

resources". The forum operates under an agreed terms of reference (DFO 2011). While the discussion is intended to be at the strategic level, specific operational examples, e.g. specific fisheries, may be used to demonstrate and/or clarify broader policy objectives. These meetings are scheduled to take place 3 times a year. A forum secretariat produces records of the discussion from these meetings and distributes to the forum members. An annual review of the effectiveness of the forum and its continued existence is reviewed annually.

At a national level, DFO also undertakes consultations on national policy and legislative issues and these are advertised on the DFO website <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/comm/consultation-eng.htm>. DFO also conducts regional consultation on national and regional policy initiatives. These are also posted on DFO regional websites, e.g. <http://www.inter.dfo-mpo.gc.ca/Maritimes/Oceans/Species-at-Risk/Public-Consultations>.

3.7.6 Long term and fishery specific objectives

ICCAT

ICCAT's principle objective is to maintain species within their remit at levels which will permit the, "maximum sustainable catch for food and other purposes". Since its establishment, ICCAT has implemented a wide range of tools for the conservation and management of stocks, including total allowable catch (TAC) and catch quotas (Member allocations), size limits, effort restrictions, observer programs, closed areas and seasons, vessel registration, information exchange, gear restrictions, and enforcement measures. ICCAT defines harvest control rules (HCRs) primarily through the definition of TACs intended to maintain or rebuild stocks to the MSY biomass.

Specifically with respect to swordfish, in 1999, ICCAT set an objective of rebuilding the North Atlantic swordfish stock within 10 years, to the biomass that would produce MSY with a greater than 50% probability (ICCAT, 1999). With Contracting Parties commitment, including agreement on a reduced TAC and country specific allocations, this was achieved.

Canada

As a Contracting Party of ICCAT, Canada is obligated to implement the management measures agreed by ICCAT in accordance with its own objectives and management procedures. Canada can impose more stringent restrictions within its own waters and on its own licensed vessels, but these must not undermine the effectiveness of those measures agreed by ICCAT.

Stock conservation and other sustainability objectives for the longline swordfish fishery stem from Canadian legislative and evolving policy developments such as the Ocean's and Species at Risk Acts, the Atlantic Fisheries Policy Review, the Aboriginal Fisheries Strategy and Sustainable Fisheries Framework. The IFMP (DFO, 2013) reflects the policy objectives set out in these documents with five overarching objectives for managing the Canadian swordfish fishery:

Conservation objectives

1. Productivity: Do not cause unacceptable reduction in productivity so that components can play their role in the functioning of the ecosystem.
2. Biodiversity: Do not cause unacceptable reduction in biodiversity in order to preserve the structure and natural resilience of the ecosystem.
3. Habitat: Do not cause unacceptable modification to habitat in order to safeguard both physical and chemical properties of the ecosystem.

Social, cultural and economic objectives

4. Culture and Sustenance: Respect Aboriginal and treaty rights to fish.
5. Prosperity: Create the circumstances for economically prosperous fisheries.

3.7.7 The decision-making process

ICCAT

Article III of the ICCAT Convention requires decisions of the Commission to be taken by a majority of the Contracting Parties, each Contracting Party having one vote. Two thirds of the Contracting Parties constitute a quorum. In practice, however, ICCAT has traditionally used consensus decision-making.

The Commission receives advice from its Committees, e.g. scientific advice on issues such as stock status and catch limits comes from the SCRS. The Commission meets annually to review this advice and to develop, decide and implement conservation and management measures. ICCAT's principle objective is to maintain populations at levels which will permit the maximum sustainable catch for food and other purposes.

Since its establishment, ICCAT has implemented a range of tools for the conservation and management of stocks, including TAC and catch quotas (Member allocations), size limits, effort restrictions, observer programs, closed areas and seasons, vessel registration and information exchange, gear restrictions, and enforcement measures.

Two external performance reviews of ICCAT (Hurry et al, 2009 and Spencer et al, 2016), have specifically reviewed the decision making process. Hurry et al (2009), noted the fundamental processes for decision making within ICCAT are sound providing the processes and the advice from the scientific and other committees are followed. However, the review noted that, social and economic issues have tended to prevent taking hard decisions at an early point in time and subsequently the Commission has found itself having to make tougher decisions to implement catch restrictions and recovery plans, the Atlantic and Mediterranean bluefin tuna fisheries were cited as examples.

Spencer et al (2016) noted the increased number of Contracting Parties makes consensus more difficult and the approach has often led to either the postponement of decisions, the change in proposals from a legally binding Recommendation to a non-legally binding Resolution, or continued deferral of decision-making on the adoption of measures.

At its 2015 meeting, ICCAT adopted two Resolutions that state that when making Recommendations pursuant to Article VIII of the Convention, the Commission should: (a) apply a precautionary approach, in accordance with relevant international standards (Resolution 2015-12); and, (b) apply an ecosystem-based approach to fisheries management (Resolution 2015-11). The formulation of these resolutions is consistent with the UN Fish Stock Agreement and the FAO Code of Conduct for Responsible Fisheries.

In their respective preambles, Resolutions 2015-11 and 2015-12 make reference to the discussions taking place within the ICCAT Convention Amendment Working Group on the incorporation of a precautionary approach and an ecosystem approach to fisheries management and in the proposed amendments to the ICCAT Convention and, since the publication of these Resolutions, the Working Group has explicitly included the need to apply the ecosystem and precautionary approach in their draft revisions of the Convention (ICCAT 2016b).

Furthermore, Spencer et al (2016) notes that ICCAT has been inconsistent in applying the precautionary approach, having not always applied the precautionary approach where scientific information is uncertain, unreliable or inadequate and therefore recommends that Resolution 15-12 is transformed into a Recommendation and a revised Convention contains an explicit commitment to apply the precautionary approach.

Canada

The IFMP (DFO, 2013) sets out the fisheries specific decision-making process under the heading of, “Approval Process”, and is replicated here:

- a) ICCAT sets quota and international management requirements;
- b) Advisory Committee involvement:
 - i. SFLPAC – discusses management measures and objectives based on Canadian perspective. Depending on the nature of the issues (regional or inter-regional) recommendations are made either directly to the Maritimes Regional Director General (RDG) or to ALPAC.
 - ii. ALPAC – based on ICCAT and SFLPAC discussions, this group makes recommendations to meet both the international obligations and domestic (Canadian swordfish IFMP).
- c) Recommendation submission:
A memo is prepared by Resource Management (Regions or DFO-Ottawa) to provide Advisory Committee discussions and recommended measures to sustainably manage the swordfish and other tuna fisheries.
- d) Approvals:
The Minister of Fisheries and Oceans delegates the authority for some approvals to national or regional staff but continues to retain final authority for fisheries management.

DFO also convenes meetings as part of the Regional Advisory Process (RAP) to review science and provide advice and recommendations to management. This is an open process with peer review and stakeholder engagement. RAPs have been held in relation to monitoring the incidental catch in the swordfish and tuna fisheries. The proceedings, participants and reports from the RAP are published on the DFO website - <http://www.dfo-mpo.gc.ca/Library/344509.pdf>.

The IFMP explicitly refers to the approach Canada takes with respect to applying the precautionary approach for commercial species. It also explicitly includes a section explaining how DFO intends to implement ecosystem based management (EBM) to fisheries. It is within the framework of the EBM that DFO aims to take into account the effect of fisheries on non-commercial species and habitats (DFO, 2013).

3.7.8 Incentives for sustainable fishing

ICCAT

ICCAT's Conservation and Management Measures Compliance Committee annually reviews member country's adherence with ICCAT Recommendations. Such reviews may be viewed as providing a positive incentive for sustainable fishing, particularly since management plans usually call for quota overshoots to be repaid (deducted from future quotas). However, the ineffectiveness of the Compliance Committee in holding member countries accountable (not generally a problem for swordfish, but it has been for other species) undermines the incentive value of the Committee (Spencer et al, 2016).

ICCAT does not directly provide any subsidies that contribute to unsustainable fishing.

Canada

The ITQ system implemented in the swordfish longline fleet provides a quasi property right to the licence holder that removes the competitive drive among harvesters that may lead to unsustainable fishing habits. Under the ITQ system harvesters can better plan for the fishing season, as they know their quota and can plan for the most opportune time to harvest it.

In addition to increased stability in the fishery the involvement of stakeholders in management may help to promote sustainable fishing practices. All stakeholders involved either directly or indirectly in the longline large pelagic fishery have the opportunity to have input into the management of the fishery through either SFLPAC and/or ALPAC. Being involved in management discussions and decisions, including the development of the industries CHP, can help to instill a sense of stewardship and ownership of the resource, leading to more sustainable habits to protect the resource.

Individual license holders are also bound to abide to the CHP by legal contract by the NSSA (NSSA, 2016). The contract clearly outlines all operational aspects for the fishery, including time/area closures, hailing protocols, observer coverage levels, quotas for both the fleet and the individual harvester, quota transfer processes, and penalties for exceeding individual quotas. The NSSA have taken action against members in the past following quota infringements (T. Atkinson, pers. comm., 2016).

3.7.9 Monitoring, control and surveillance

ICCAT

The ICCAT Convention does not explicitly provide ICCAT with competence related to monitoring, control and surveillance (MCS) and so has no enforcement capacity. As with other RFMOs, ICCAT relies on its Contracting Parties to implement management measures, through suitable harvest control tools that will allow the stated objectives for the management of the overall fishery to be met.

Through Article IX of the Convention, the Contracting Parties have agreed to take all action necessary to ensure the enforcement of the Convention, and undertake to collaborate with each other with a view to the adoption of suitable effective measures to ensure the application of its provisions, including to set up, “a system of international enforcement” to be applied to the Convention Area.

ICCAT has a Compliance Committee with the function of reviewing the implementation of ICCAT conservation and management measures and domestic measures taken to support this implementation. The terms of reference further require the Committee to review the port inspection programs and other programs and activities domestically that are focused on identifying problems with non-compliance.

The 2008 Performance Review (Hurry et al, 2009) highlighted poor adherence by Contracting Parties to the rules and recommendations made by the Commission as one of the most serious problems needing attention by the Commission. This was influenced by the then, serious non-compliance issues related to eastern Bluefin tuna (Spencer et al, 2016). Since then, ICCAT has adopted stricter measures through Recommendations, to address the problem. No specific issues with respect to compliance for the North Atlantic swordfish fishery were highlighted in the 2008 or 2016 ICCAT reviews, although there is a recommendation in the 2016 review for ICCAT to establish a list of licensed fishing vessels authorized to fish for swordfish in the North Atlantic (Spencer et al, 2016).

Canada

DFO's Conservation and Protection Division (C&P) supports conservation and sustainability of the swordfish and other tuna fisheries through the delivery of their surveillance, inspection and enforcement program.

Coastguard patrols are used to monitor boundary lines and closed areas, as well as provide a platform from which C&P Fishery Officers can conduct at sea boarding to inspect catch and catch records, monitor fishing activity, assess species composition and check weights. Due to the large area covered by the fleet, at sea vessel monitoring (i.e. boardings) coverage is low, so aerial surveillance, satellite monitoring (Vessel Monitoring System - VMS) and at sea observers take on greater roles in the delivery of the C&P of this fleet.

The scientific data related to catch and effort, and any biological sampling that is conducted at sea is used by the C&P Division to monitor compliance with respect to incidental catch and juvenile swordfish. Shore-based Fisheries Officers also work with dockside monitors to ensure the integrity of landing data, i.e. species identification and reported catch weights.

Aerial surveillance is DFO's prime means of compliance with ICCAT recommendations with respect to Illegal, Unlicensed, Unreported vessels (IUU).

The IFMP has a section dedicated to compliance which includes a description of the compliance activities carried out in the swordfish fishery, i.e. a compliance strategy, examples of non-compliance, details of enforcement effort between 2005 and 2012, e.g. number of enforcement hours, patrol days, aerial surveillance hours, violations and a compliance index (violations per hour of enforcement), number and type of convictions. The IFMP states that it typically spends 1% of its annual enforcement effort on large pelagic species, of which half is dedicated to swordfish and, given the relatively small number of active harvesters in the fishery; C&P considers this to probably be commensurate.

While the IFMP has not been updated since 2013 MSC annual audit teams have been provided with an update on enforcement activity and, at the 4th audit, C&P provided enforcement analysis for the period 2012 – 2015. At no time throughout the certified period has there been evidence of significant compliance issues or systematic non-compliance.

The annual longline swordfish fishing licences (DFO, 2016d) include a list of conditions that the vessel/owner must adhere to, these include:

- Prohibited fishing areas;
- Minimum landing sizes;
- Fishing gear stowage requirements when transiting areas closed to fishing with longline;
- Individual swordfish quota;
- The use of corrodible circle hooks
- Retained species requirements, e.g. minimum size/weight for swordfish; finning requirements for retained sharks;
- Non retained species requirements, e.g. release of: porbeagle sharks, marlin, SARA or ICCAT listed;
- Requirements for hailing in and out;
- Requirements for carrying an observer;
- Functioning VMS;
- Offloading requirements;
- Landing documents / logbook / SARA logbook requirements;

- Carriage and certification to use turtle dehooking/disentanglement equipment;
- Adherence to the “Code of conduct for responsible sea turtle handling and mitigative measures”.

An administrative and court-based sanction framework is outlined in the Fisheries Act and regulations with court based prosecution for serious offences through the Canadian Criminal Code (1985). Upon conviction maximum penalties of \$500,000 and up to two years in jail may be imposed along with forfeiture of catch and equipment at the discretion of the court.

3.7.10 Management evaluation

ICCAT

In response to concerns about increased pressure on tuna stocks and a more general concern about the performance and achievements of RFMOs, ICCAT conducted its first external performance review in 2008 (Hurry et al, 2009). A second review was conducted in 2016 (Spencer et al, 2016). On both occasions, ICCAT appointed an independent panel consisting of three international fisheries experts to undertake the review.

The terms of reference (TOR) for the initial review were developed following discussions in the UN, FAO and meetings of RFMOs and, in summary, tasked the panel to:

- Evaluate and analyse the ICCAT Convention Basic texts;
- Assess the measures in place to achieve ICCATs objectives and ways to achieve them; and,
- Recommend how to improve ICCAT performance, including changes to the Convention.

The TOR for the second review tasked the panel to:

- Evaluate how ICCAT responded to the first review;
- Assess the functioning of the Commission and its subsidiary bodies;
- Compare, where possible, the performance of ICCAT with other tuna RFMOs, and highlighting best practices adopted by other RFMOs that could help strengthen ICCAT; and,
- Identify areas where improvement is needed and recommend on how performance could be improved.

The following is a summary of the positive and negative outcome of the 2016 panel's assessment of ICCAT's performance. On the positive side:

- ICCAT made significant progress in strengthening its performance since the 2008 Performance Review;
- In the main, ICCAT has in place appropriate measures to conserve stocks in line with ICCAT's objective of maintaining stocks at B_{MSY} ;
- In regard to the 2008 Panel's main criticism on eastern bluefin tuna, ICCAT has redressed the situation, both in terms of the status of the stock and the conduct of the fishery;
- Considerable progress has been made by ICCAT with regard to the re-building plans, with the exception of marlins;
- ICCAT compares reasonably well with other RFMOs on associated species including sharks, seabirds and turtles;
- ICCAT has in place quota allocation schemes for most of the key stocks, which reinforce the effectiveness of the implementation of the conservation and management measures, and an openness to adjusting those schemes on a regular basis;
- ICCAT now addresses the management of shark fisheries, although the measures

adopted to date have not been that ambitious;

- ICCAT has in place effective mitigation measures to reduce incidental mortality of sea turtles and seabirds in ICCAT fisheries;
- ICCAT has introduced an annual review of Contracting Parties compliance record, although the focus of this review should be on compliance with substantive fisheries regulation and not on the submission of data issue;
- ICCAT has further expanded the ability of non-governmental organisations (NGOs) to participate in ICCAT meetings as well as their access to documents; and
- ICCAT scores well in terms of agreed forms and protocols for data collection.

On the negative side:

- ICCAT - its Panels and Committees - have a tendency to defer decision-making on measures in the interests of achieving consensus, rather than opting for a voting process, thereby unnecessarily delaying the adoption of necessary conservation and measures;
- ICCAT has not addressed in an effective manner the management of the tropical tuna (bigeye) and marlin fisheries;
- There appears to be a reluctance in ICCAT to consistently apply the precautionary approach, especially when considerable uncertainties underlie the assessments for certain stocks;
- ICCAT does not possess sufficient mechanisms for effective at-sea monitoring of fishing operations for most stocks, with the exception of eastern bluefin tuna, and that a modern high seas boarding and inspection scheme needs to be adopted;
- The most recent draft of the Amended ICCAT Convention does not take into account, in certain respects, recent developments in international fisheries law and best practices among RFMOs;
- Major progress in data availability is necessary;
- A better balance of scientists with knowledge of the fishery and modeling expertise be sent to the assessment meetings of the SCRS and that ICCAT develops specific mechanisms to ensure that more scientists with knowledge of the fisheries participate in stock assessment meetings and are directly involved in assessment teams.

At the time of writing this report the response of ICCAT to the review was not available.

Canada

The IFMP highlights that reviews of elements of the fishery specific management system take place, e.g. compliance and enforcement regularly reviews data enabling it to better manage risk and deploy resources. The advisory committees – SFLPAC and ALPAC - provide opportunity to review aspects of the management of the swordfish longline fishery and discuss any issues/concerns and make recommendations to DFO on the domestic management of the fishery. Furthermore, DFO conducts annual post-season reviews which include the management of the fishery and whether any improvements or adjustments in management should be considered (B. Lester, pers. comm., 2016).

With respect to external review, the Parliament of Canada has two committees related to Fisheries and Oceans: The Standing Committee on Fisheries and Oceans of the House of Commons and the Senate Standing Committee on Fisheries and Oceans of the Senate. Both committees regularly review different aspects of fishery management in Canada and publish reports with their findings and conclusions. To date, the North Atlantic swordfish fishery has not been the subject of review by either committee.

The Canadian Auditor General has, on an ad-hoc basis, reviewed fisheries related issues, although this has not happened since 2009 when the protection of fish habitat was reviewed (OAGC 2009).

3.7.11 Research

ICCAT

The Standing Committee on Research and Statistics (SCRS), on which each member of the Commission may be represented, is responsible for providing scientific advice to the ICCAT Commission.

ICCAT conducts periodic stock assessments of tunas and tuna like species through its Standing Committee on Research and Statistics (SCRS). These assessments underpin the scientific advice for management that is provided to the Commission. ICCAT assessments aim at evaluating the sustainability of current and proposed future harvest practices in light of the Commission's objective to maintain the populations at a level that permits their maximum sustainable catch. The current schedule of assessments is posted on the ICCAT web site <https://www.iccat.int/en/assess.htm>. Assessments can be undertaken more frequently when there is reason to be concerned for changes in stock status for example if negative indicators arise from the fisheries.

The last assessment for Atlantic swordfish was conducted in 2013 (ICCAT 2013). The next assessment is expected to take place in 2017. In the meantime, the Swordfish Species Group of the SCRS meets annually to assess any new information, update the SWO Executive Summaries and develop the workplan for the following year.

At its 2014 meeting, the SCRS adopted the 2015-2020 Science Strategic Plan for the “functioning and orientation” of the SCRS (ICCAT, 2014). The plan includes a Mission, a Vision, a SWOT (strengths, weaknesses, opportunities, threats) analysis and the guiding principles of the plan. The plan also comprises Goals, Objectives and Strategies to achieve each goal, as well as measurable targets. A tentative work plan for the time period (scheduling of SCRS meetings) is also included and an estimated budget in the context of the envisioned needs and proposed work of the SCRS for the five year period. As well as target species, research on shark species and non-target, incidentally caught species are included in the plan.

Canada

Canada contributes to the ICCAT scientific process through its own research and through participation of scientists at SCRS meetings.

The IFMP does not include a research plan but does have a section on research, highlighting that the primary focus on the swordfish research programme has been the improvement in the quality of information (catch, catch-at-size and effort) in order to contribute to the ICCAT stock assessment. It also highlights collaborative work it has undertaken with US scientists on Pop-Up Satellite Archival Tag (PSAT) studies on swordfish which looked at the seasonal distribution and migrations of the Northwest Atlantic swordfish, and, work DFO is undertaking to address the incidental catch of bluefin tuna, shortfin mako porbeagle, blue and sharks, and leatherback and loggerhead sea turtles.

DFO have developed annual workplans for “Large Pelagics – Blue Fin and Swordfish” (DFO, 2017), “Shark and Dogfish” (DFO 2017a) and “Sea Turtles” (DFO, 2017b). These include research plans and explicitly describe how research, monitoring, data management and

scientific advice link to the DFO decision making process.

4 Evaluation Procedure

4.1 Harmonised Fishery Assessment

In January 2016, the MSC Board of Trustees signed off the MSC proposal for a limited trial of annual harmonisation pilots to help improve harmonisation in response to difficulties for fisheries with RFMO-managed highly migratory species.

Following the first pilot in March 2016 for assessed and in-assessment fisheries managed under the auspices of the Western & Central Pacific Fisheries Commission (WCPFC), a further harmonisation pilot meeting took place in Washington DC, USA, on 22-23 August 2016 for assessed and in-assessment North Atlantic swordfish fisheries managed under the auspices of ICCAT.

In summary, at the meeting, P1 and P3 team members from the certified and in-assessment ICCAT swordfish fisheries, reviewed, discussed and agreed scoring rationale text for each Principle 1 scoring issue under each scoring guidepost using the CR v1.3 scoring table. An independent facilitator appointed by the MSC assisted the process.

Stakeholders were made aware of the process and were provided opportunity to submit comments and evidence prior to the meeting. Two stakeholder groups provided submissions and these were taken into account within the rationale drafting and scoring process.

On completing the P1 scoring, the opportunity was taken to review PI 3.1.3. Harmonisation on this PI had not been achieved in two previous audit cycles for the US North Atlantic Swordfish Longline and the North West Atlantic Canada Longline and the North West Atlantic Canada Harpoon fisheries. It had therefore been agreed that this harmonisation pilot should also be used for this purpose.

An independent peer reviewer with P1 expertise was appointed by the MSC Peer Review College and participated in the meeting.

Given the non-normative approach to harmonisation, the MSC's third party accreditation provider, Accreditation Services International (ASI), was present to observe and evaluate the auditability of the process.

Members of the MSC Standards Team and regional outreach staff were also present to provide guidance and answer any questions related to interpretation.

The draft P1 scoring table and draft score and scoring rationale for PI 3.1.3 were then made publicly available and circulated to registered stakeholders by the Conformity Assessment Bodies (CABs) that have certified the SLLC US North Atlantic Swordfish Longline, the US North Atlantic Swordfish, the North West Atlantic Canada Longline and the North West Atlantic Canada Harpoon fisheries. Stakeholders were provided with 30 days to provide comments.

Following the 30 days consultation, the P1 and P3 team members reconvened remotely to review, respond and where appropriate, amend any of the scoring rationales or scores. The MSC appointed facilitator and MSC staff also participated.

Two submissions from stakeholders were received via Acoura Marine. These were taken into account and responses from the CAB were provided to the stakeholders.

The final scoring rationales, scores and a condition were agreed following further correspondence between the group. The outcomes from the harmonisation pilot are set out

in a final report on the MSC website: [https://fisheries.msc.org/en/fisheries/north-west-atlantic-canada-longline-swordfish/@ @assessments](https://fisheries.msc.org/en/fisheries/north-west-atlantic-canada-longline-swordfish/@@assessments)

It was agreed that the outcome of the harmonisation pilot would be used by the audit and assessment teams at the next audit/assessment of their respective ICCAT managed swordfish fisheries and, if new information becomes available, that changes scores and scoring rationales, further harmonisation between CABs will be required.

Subsequent to the above, new information with respect to the ICCAT Harvest Control Rule for North Atlantic swordfish (related to PI 1.2.2) was made available following the 2016 annual ICCAT meeting. This information was shared with assessment teams from the respective CABs and, through correspondence, a revised score and scoring rationale was agreed for PI 1.2.2. This is presented in Appendix 1, below.

4.2 Previous assessments

The Northwest Atlantic Canada Longline Swordfish Fishery was assessed previously against the MSC standard⁵ and was certified on 19th April 2012.

In 2012, the Public Certification Reports for each fishery concluded the following overall scores and conditions of certification (from Intertek Moody Marine, 2012):

Table 10. Overall scores achieved when the fishery was first assessed and certified in 2012.

MSC Principle	Fishery Performance
Principle 1: Sustainability of Exploited Stock	80.6
Principle 2: Maintenance of Ecosystem	82.0
Principle 3: Effective Management System	81.3

Eleven conditions were placed on the fishery. The following Table 11 shows each of the conditions, when they were closed, what actions resulted in their closure and their revised score.

⁵ The original assessment of the swordfish fishery was made against the MSC Fisheries Assessment Methodology (FAM) v.1 (July 2008), this version of the FAM is no longer available on the MSC website.

Table 11. Summary of previous assessment Conditions

Condition	PI	Year closed	Justification
<p>1. By the 4th surveillance audit, evidence must be provided to show that the Limit Reference Point (LRP) is set above the level at which there is an appreciable risk of impairing reproductive capacity for the North Atlantic Swordfish stock.</p> <p>Recognizing that ICCAT is the body responsible for the development and implementation of reference points, to address the condition the assessment team requires that the client is to work with DFO to strongly encourage ICCAT to develop an explicit Limit Reference Point for North Atlantic Swordfish stock. This LRP must be set above a stock biomass (t) at which there is an appreciable risk of recruitment being impaired. The client and DFO must submit a formal request to ICCAT to develop an explicit LRP for the stock within four years of certification. A copy of this letter must be provided at the first annual surveillance audit.</p>	1.1.2	Year 4	<p>This PI was reviewed as part of the pilot harmonization meeting described in section 4.1 of this re-assessment report. The meeting concluded that the SG 80 had been met and therefore this condition was closed.</p>

Condition	PI	Year closed	Justification
<p>2. By the fourth surveillance audit, evidence must be presented by the fishery client which shows that well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.</p> <p>As defined by the first scoring issue of the 80 scoring guidepost, an explicit HCR which stipulates how fishing mortality is reduced as the limit reference point (see PI 1.1.2) is approached needs to be implemented for this stock by ICCAT.</p>	1.2.2	Year 4	<p>The MSC Interpretation on Harvest Control Rules (HCRs) distributed to CABs on 16 December 2015, explains that "...'generally understood' HCRs do not need to be well defined or explicitly agreed, but there should be at least some implicit agreement supported by past management actions from which to understand that 'generally understood' rules exist, and there should be no reason to expect that management will not continue to follow such generally understood rules in future and act to be responsive to changes in indicators of stock status with respect to explicit or implicit reference points."</p> <p>ICCAT has a history of taking management action to reduce the exploitation rate in the NA swordfish fishery in response to stock and fishing mortality status estimates. Fishing mortality rates were reduced by several ad hoc measures including transfer of effort to the South Atlantic by some countries, implementation of a minimum size and, later in the 1990s, the implementation of TACs which were renegotiated after every stock assessment.</p> <p>In 1999, ICCAT implemented a more formal, ten-year rebuilding plan under Recommendation (Rec) 99-02 (see PI1.1.2) and has set TACs, catch limits, and other technical regulations regularly since that time, following advice from the SCRS, to rebuild and maintain the North Atlantic swordfish stock above Bmsy.</p> <p>In 2011, ICCAT adopted Recommendation 11-13 setting out principles of decision making for ICCAT conservation and management measures (ICCAT 2011). This describes a generally understood decision-making framework based on a harmonized format for tuna RFMO science bodies to convey advice (Strategy Matrix) agreed at the Second Joint Meeting of Tuna RFMOs in June 2009 in San Sebastian, Spain. Recommendation 11-13 guides the Commission in developing management measures responsive to stock status as represented on the Kobe Plot (a standardized "four quadrant, red-yellow-green" format, which is widely embraced as a practical, user-friendly method to present stock status information). The Recommendation sets out clearly how management measures should be designed depending on where status is estimated in the Kobe quadrants, generally codifying the type of action taken in Recommendation 99-2. In all cases, the requirement set out is that management measures should be designed to maintain the stock at, or rebuild to, Bmsy, with a high probability. Where appropriate (overfishing and overfished) the adoption of a rebuilding plan is required.</p> <p>The framework does not specify actions with respect to approaching limits but is designed around achieving targets with high probability, considering both stock status and exploitation rate with requirements to reduce exploitation rate when it is above Fmsy. By definition, as the framework is designed to achieve the TRP with high probability and maintain fishing mortality</p>

Condition	PI	Year closed	Justification
			<p>below Fmsy, it will also act to maintain the stock above the implicit LRPs (see PI1.1.2 si(b)). This represents, generally understood HCR that is consistent with the harvest strategy.</p> <p>Further, ICCAT recommendation 13-02 (ICCAT, 2013) on the conservation of North Atlantic swordfish, specifies at paragraph 5 that: The SCRS and the Commission shall begin a dialogue to allow for the development of harvest control rules (HCRs) for consideration in any subsequent recommendations. Further, while the HCRs are being developed, should the biomass approach the level which triggered the establishment of the previous rebuilding plan [Rec 99-02] then management measures should be considered to avoid further decline and begin to rebuild the stock.</p> <p>The SG60a requirements are therefore met.</p> <p>A new recommendation in 2016 (recommendation 16-03; ICCAT, 2016a) is more explicit. It specifies a “rebuilding plan”, determines when a “rebuilding plan” shall be triggered, and clearly states a requirement for harvest levels as recommended by the SCRS that will meet the Commission’s objectives of maintaining or rebuilding stocks to Bmsy within the defined (10 year) period. It also specifies that the Commission “shall adopt” those harvest levels. Specified actions are required if the biomass is estimated/projected to fall towards 0.65 Bmsy.</p> <p>The MRAG and Acoura teams note that:</p> <ol style="list-style-type: none"> 1. The SCRS undertakes regular reviews and provides regular advice; 2. The SCRS reviews don’t just look at current status, they project future status with measures of uncertainty. 3. The trigger is, in effect, above 0.65 Bmsy; Recommendation 16-03 states that “should the biomass approach the level which triggered the establishment of the previous rebuilding plan [Rec. 99-02], then the Commission shall adopt a 10-year rebuilding plan.”; 4. The minimum expectation is rebuilding within 10 years. 5. The words, “maintaining or rebuilding” imply a more precautionary approach and the possibility of triggering the plan well above 0.65 Bmsy. <p>We further note that the Rec 99-02 rebuilding plan pre-dated any certifications and has been invoked to suggest a general approach, supporting SG60 scoring. It was put in place when the Commission recognised the advice of the SCRS that the stock was over exploited, but not in response to a pre-planned rule guiding the Commission’s decision making. Rec 99-02 outlined (at Para 1) that a 10-year rebuilding program will be implemented to achieve Bmsy, and set up</p>

Condition	PI	Year closed	Justification
			<p>new catch limits for contracting parties. It also specified (at Para 9) that the SCRS should regularly conduct an assessment and provide advice. But it did not say how the Commission must react to that advice. The rebuilding of the swordfish stocks to above Bmsy demonstrates that the control implemented worked as desired and the requirement in advance to follow this action, should the biomass approach the level at which it was previously put in place, is now codified in Rec 16-03.</p> <p>The SG80a requirements are therefore met.</p> <p>NOTE: A process to develop HCR using Management Strategy Evaluation (MSE) is in effect. Recommendation 15-07 (ICCAT 2015) is on the development of HCR using MSE and includes specifications for the SCRS to advise the Commission on setting reference points for all stocks, including a 5-year schedule for the establishment of species-specific HCRs. At this stage, therefore, ICCAT planning for HCR development, including LRP, TRP and other settings, is in-train. Once completed, it is possible that SG100 might be achieved at PI1.2.2(b). MSE is not a requirement to specify actions in a well-defined HCR and SG80 may in principle be achieved without it (at PI1.2.2(a) and/or (b)).</p> <p>The SCRS assessments provide the Commission with estimates of projected biomass for a range of TAC options along with the associated probability of being at or above BMSY. It has also advised the Commission on TACs that would achieve a specified probability of being at or above Bmsy (e.g. 75% in ICCAT, 2012). These probabilities are based upon the main uncertainties in the stock assessment, with consideration of alternative assessment approaches and multiple sensitivity tests (see PI 1.2.4). The HCR can therefore be considered to take account of the main uncertainties (due to data, assumptions and assessment model) in setting harvest levels.</p> <p>The requirements of SG80b are met.</p> <p>The HCR framework is an instruction to the Commission on how to proceed given status estimates and outlook advice from the SCRS. It naturally incorporates uncertainties due to the scientific processes but does not account for other uncertainties related, for example, to implementation error or issues not considered in the stock assessment processes, such as environmental or ecological processes.</p> <p>The requirements of SG100b are not met.</p> <p>ICCAT relies on its CPCs to constrain domestic harvesting within each country's or entity's catch limit. In addition, minimum size regulations have been established for the Convention area. Countries can implement domestic controls above and beyond these limits to further the conservation of NA swordfish. For example, US-specific tools include fleet quotas, individual</p>

Condition	PI	Year closed	Justification
			<p>quotas, time/area closures, observer coverage requirements, VMS requirements, dockside monitoring requirements, hail in/out requirements, logbook requirements, season, transfer processes and bycatch reduction measures.</p> <p>There is evidence that clearly shows these tools used to implement harvest control rule is appropriate and effective in achieving the required exploitation levels (ICCAT, 2009b; 2012a). While there is evidence that the catch was reduced further than required by the TAC reductions implemented as part of the rebuilding plan, the successful rebuilding of the stock to Bmsy between 1999 and 2009 nevertheless shows that these tools are appropriate and effective in controlling exploitation. The consistent decline in fishing mortality from 1999 to recent years (since when it has been stable) is shown in the stock assessment outputs (for example, Figure 8 of ICCAT, 2015a). The Commission is committed to implementing the TACs (ICCAT, 2011) and has put in place carryover mechanisms to ensure this (see above).</p> <p>The requirements of SG80c are met.</p>
3. By the fourth surveillance audit, the client must provide evidence that partial strategies for shortfin mako and porbeagle sharks have demonstrably effective management measures in place such that the fishery does not hinder their recovery or rebuilding.	2.1.1	<p>Short fin mako - closed year 2</p> <p>Porbeagle – closed year 4</p>	<p>Short fin mako The shortfin mako assessment (ICCAT, 2012b) indicates improved status. Several assessment models indicate that biomass was above B_{MSY} and fishing mortality below F_{MSY} in 2011. It is highly likely that North Atlantic shortfin mako shark is within biologically based limits, scoring SG80. Also, arguably, there is a high degree of certainty that North Atlantic shortfin mako shark stock is above biologically based limits. The PI for this species can therefore be re-scored at 80 and shortfin mako can be removed from the condition.</p> <p>Porbeagle The latest stock assessment information for porbeagle was presented by Campana et al. (2013). The authors ran four variants of a forward projecting, age and sex-structured life history model, fit to catch-at-length and catch per unit effort data to the end of 2008, although some information including catch and discards was updated to the end of 2011. The four variants of the population model differed in their assumed productivity, but all variants of the model predicted porbeagle recovery to 20% of spawning stock numbers (SSN20%) before 2014 if the human-induced mortality rate was kept at or below 4% of the vulnerable biomass (Campana et al., 2013).</p> <p>Hooking mortality and post-release mortality estimates for porbeagle have been assessed by on-board observers of Canadian fishing vessels since 2010 and were reported by DFO (2015). Accounting for landings, capture mortality and post-release mortality, the total annual mortality of porbeagle from all commercial fishing activities in Canadian waters from 2009 to 2014 has</p>

Condition	PI	Year closed	Justification
			<p>averaged 107 t (range 88 – 164 t); this represents a mortality rate of approximately 2% (DFO 2015).</p> <p>Although, following Campana et al. (2013), these catch and mortality data indicate that the porbeagle population status is now likely to be above the SSN20% level, this cannot be confirmed in the absence of an updated assessment for porbeagle; therefore, it is not possible to say that porbeagle meets the SG80 requirement of being “highly likely to be within biologically based limits”.</p> <p>Nevertheless, the alternative requirement at SG80 for the first SI of PI 2.1.1 is that “if (porbeagle is) outside the limits, there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.”</p> <p>In this regard, it is noted that the MSC defines a partial strategy as a “cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically” (MSC 2013b).</p> <p>There are a number of management measures in place for porbeagle in Atlantic Canada, and in the certified swordfish fishery specifically. These include:</p> <ol style="list-style-type: none"> 1) A National Plan of Action for the Conservation and Management of Sharks (NPOACMS) was published and implemented (DFO 2007); 2) An update on the NPOACMS was published (DFO 2012); 3) There is a Shark Conservation Action Plan in place (DFO 2014), which objectives with tactics including to enhance monitoring and data collection, promote fishing activities that avoid bycatch species, mitigate impacts on bycatch species, and improve knowledge on post-release mortality, across all Canadian fisheries that catch sharks; 4) The directed fishery for porbeagle in Canadian waters was stopped in 2013; 5) Corrodible circle hooks and monofilament leaders must be used in the fishery (DFO 2016a); 6) Longline vessels are required to release all live porbeagle (DFO 2016a); 7) In the longline fishery, all released porbeagle must be recorded in the logbook, and a record made of their status (i.e., dead or alive) (DFO 2016a);

Condition	PI	Year closed	Justification
			<p>8) Fins may be removed from sharks taken in the longline fishery, but must be landed with the corresponding carcasses and cannot exceed 5% of the weight of the carcasses (DFO 2016a);</p> <p>9) The fishery is subject to 100% dockside monitoring, and no landings can take place unless a dockside monitor is present (DFO 2016a);</p> <p>10) There is a recommended maximum porbeagle catch limit for all Canadian fisheries of 185 t (DFO 2013), which represents a mortality rate of approximately 4%;</p> <p>11) If the 185 t catch limit was exceeded, it was confirmed by DFO (pers. comm., Canadian swordfish fishery site visit, October 2016) that this would be considered at the DFO Post-Season review, and additional measures or restrictions could be brought forward for consideration at the Atlantic Large Pelagic Advisory Council (ALPAC) in order to bring catches down (also stated in DFO 2016e).</p> <p>It is noted that the landings of porbeagle from the swordfish fishery have declined from 9.7 t and 16.2 t in 2011 and 2012 respectively, to 3.2 t, 2.7 t and 0.5 t in 2013, 2014 and 2015, respectively (DFO 2016b). Total discards of live and dead porbeagle combined in the longline fishery for the 2011-2014 period were estimated to average 61 t annually, while total mortality of porbeagle in all Atlantic Canadian fisheries for 2009-2014 was estimated to average 107 t (DFO 2015).</p> <p>For the Year 3 audit, the audit team commented on the need to understand how advised catches take into account uncertainty. For this Year 4 audit, it was confirmed by DFO that the longline fishery has been subject to average annual observer coverage of 5.8% of the sea days for the period 2011-2015 (range 3.3% - 7.8%), exceeding the 5% target level (DFO 2016c). A workshop was held in February 2016 to review the approach to incidental catch monitoring in the longline fishery, but the results were inconclusive (DFO 2016d). However, operational aspects of the observer programme for the longline fishery were revised in 2013; subsequently, observers have been tasked to longline vessels on a random basis, and only after the vessel captain has 'hailed-out' with information on the trip, including the intended region of fishing (DFO pers. comm., Canadian swordfish fishery site visit, October 2016). Therefore, whilst it cannot be confirmed that the observer coverage is representative of the fleet activities or catches, the programme is intended to be randomised and is meeting its target sea day coverage levels (with the exception of 2013, when 3.3% of sea days were covered following the revision to the observer programme – DFO 2016c). DFO has commented that the observer coverage level is currently considered to be 'sufficient' (DFO 2016e).</p>

Condition	PI	Year closed	Justification
			<p>For the Year 3 audit, the audit team also commented on the need for an articulation of the management response to changes in stock status. In this regard, the measures in place in Canada and in the longline fishery specifically are clearly targeted at porbeagle, and are intended to ensure mortality rates do not exceed 4% in response to information on stock status indicating the stock required rebuilding. The measures have been effective in bringing annual mortality rates from all Canadian fisheries down to around 2% (DFO 2015). Whilst there has not been a recent update to the porbeagle stock assessment (noting that, in the absence of fishery landings and associated sampling of porbeagle, or a dedicated porbeagle sampling study, a new stock assessment cannot be produced – DFO pers. comm., Canadian swordfish fishery site visit, October 2016), this is approximately half of the mortality rate that was expected to support a recovery of the stock back to SSN20% by 2014, even under the most pessimistic productivity assumption tested in the model (Campana et al., 2013).</p> <p>Overall, the audit team considers that the measures in place for managing the impact of the swordfish longline fishery on porbeagle constitute at least a partial strategy, and it is demonstrably effective in maintaining the impact of the swordfish longline fishery at a level that will not hinder recovery and rebuilding (i.e., mortality is less than 4%). As such, the SG80 requirement is met, PI 2.1.1 is rescored at 80, and the condition is closed. A higher score is not achieved because the SG100 requires that there is, “a high degree of certainty that retained species are within biologically based limits”, and this cannot be confirmed.</p>
4. By the fourth surveillance audit, the client must provide evidence that there is a partial strategy for conservation of sharks (porbeagle and shortfin mako) that takes account of all sources of fishing related mortality (landings and discards by the assessed fishery, other Canadian fisheries), and international fisheries. There must be an objective scientific basis to conclude that the strategy will maintain these shark stocks within biological limits or	2.1.2	<p>Short fin mako – closed year 2</p> <p>Porbeagle – closed year 4</p>	<p>Shortfin mako The new shortfin mako assessment was provided for the year 1 audit. The new assessment indicates that shortfin mako are highly likely to be within biologically based limits, thus meeting the outstanding second scoring issue of SG80. The audit team concludes that all 3 items of SG80 are met for PI 2.1.2 for shortfin mako. This species should therefore be removed from condition 4.</p> <p>Porbeagle The observations for this Condition on PI 2.1.2 are the same as those for Condition 3 on PI 2.1.1 (see above). In summary, the audit team considers that there are a number of management measures in place for porbeagle in Atlantic Canada, and in the certified swordfish fishery specifically, that constitute at least a partial strategy, and it is demonstrably effective in maintaining the impact of the swordfish longline fishery at a level that will not hinder recovery and rebuilding (i.e., mortality is less than 4%).</p>

Condition	PI	Year closed	Justification
ensure that the fishery does not hinder their recovery and rebuilding. The partial strategy must be in place for the assessed fishery so that, at a minimum, it achieves its proportionate share to conserve sharks.			
5. By the third surveillance audit, the client must provide evidence that there is a demonstrably effective partial strategy of management measures in place to ensure that the Canadian Atlantic Swordfish fishery does not hinder recovery and rebuilding of the blue shark stock. There must be some objective basis of confidence that the partial strategy will work, based on some information directly about the fishery and/or the species involved and there must be some evidence that it is being successfully implemented.	2.2.2	Year 2	Figure 33, page 77 of http://www.dfo-mpo.gc.ca/Csas-sccs/publications/resdocs-docrech/2012/2012_049-eng.pdf shows that removals of blue shark in the assessed fishery are estimated with a relatively low coefficient of variation (CV). The most recent ICCAT assessment indicates that the stock is highly likely to be within biologically based limits and the requirement to report removals to ICCAT implies that an increase in removals will be noticed; during the site visit, DFO verbally confirmed that management measures would be implemented to manage excessive discards of blue shark, should they occur. Further, the audit team notes that ICCAT has been more pro-active in recent years on shark conservation. Based on these, the audit team concludes that all 3 scoring issues of SG80 for PI 2.2.2 are met.
6. Within four years of certification, the client must provide evidence that demonstrates that direct effects of the fishery are highly unlikely to create unacceptable impacts to	2.3.1	Year 4	As has been reported annually through the audit process for the swordfish fishery, DFO has been undertaking a turtle tagging and post-capture survival monitoring study, in an attempt to more reliably establish post-capture mortality rates in loggerhead sea turtles following capture in the swordfish longline fishery. Notwithstanding the continuing collection of more information on loggerhead sea turtle post-capture mortality, there is existing information on the estimated number of loggerhead sea turtles encountered by the fishery, and on their potential fate, together with the potential impact

Condition	PI	Year closed	Justification
loggerhead sea turtles. The client should refer to Section 7 of the FAM for the specific performance requirements associated with the term “highly unlikely” that pertain to this PI.			<p>of the fishery on the loggerhead sea population. This information addresses the requirements of the second SI directly, and was detailed in the original assessment (Intertek Moody Marine 2012), which stated: “Based on the two years with high observer coverage (2001 & 2002), approximately 75% were released alive and uninjured, approximately 20% were released alive and injured, and 2% were released dead or observers were unable to determine their release status (Javitech 2003).”</p> <p>Further, Intertek Moody Marine (2012) stated: “According to the DFO RPA, the assessed fishery interacted with an estimated average of 1,200 loggerhead sea turtles between 2002 and 2008. While there is mandatory release, post hooking mortality does occur, and is estimated to range between 20 and 45%. This results in 200-500 loggerhead sea deaths annually in the Canadian longline fishery (DFO, 2010). While the Atlantic adult population (females) has been demonstrated to be declining since 1998, it is highly unlikely that the assessed candidate fishery is the cause of the endangered status of the species, and Atlantic pelagic longline fisheries is one of several current threats (based on the analyses in the US Recovery Plan for the species. In this regard, the US Recovery Plan provides mortality estimates in units of “adult equivalencies”, wherein mortalities at each life stage are adjusted for expected lifetime reproductive contribution, given the individual’s age, probability of reaching maturity and expected life span. Conversion of the life stages caught in the Canadian tuna and swordfish longline fisheries (oceanic and neritic juveniles) to adult equivalents using survivorship rates provided in the US Recovery Plan results in an estimate of 5-15 adult equivalent mortalities annually for 2002-2008. For comparison, estimates of total annual mortalities in adult equivalents for the North Atlantic overall are 9,417 individuals for trawl fisheries and 872 individuals for pelagic longline fisheries.”</p> <p>In reviewing the information available for this audit, the assessment team went back to the US Recovery Plan (NMFS & USFWS 2008). The estimated total annual adult equivalent mortality for loggerhead sea turtles in all fisheries was estimated to be 12,434 animals, such that the annual take in the swordfish longline fishery in terms of adult equivalent values is estimated to equate to 0.04 - 0.12% of the total.</p> <p>An important consideration during the course of auditing the North West Atlantic Canada longline swordfish fishery has been observer coverage, and specifically the representability of the data collected by observers with respect to spatial coverage and catches of the swordfish longline fishery as a whole. On this issue, a workshop was held in February 2016 to review the approach to incidental catch monitoring in the longline fishery, but the results were inconclusive (DFO 2016d); as such, it is not confirmed if observer coverage on vessels in the swordfish longline fishery provides a representative understanding of the spatial distribution of effort or</p>

Condition	PI	Year closed	Justification
			<p>the catch profile of the fishery. Nevertheless, with the exception of 2013 when the observer programme was revised and only 3.3% of the sea days were observed, the 5% target observer coverage level has been achieved (DFO 2016c) and the observer programme is now randomised with the aim of minimising the potential for bias (DFO pers. comm., Canadian swordfish fishery site visit, October 2016). Further, skippers are required to undertake turtle release training as a condition of licence (DFO 2016a), and emphasis is being placed on minimising the amount of line left on hooks if animals are released by cutting the traces, which is understood to be key in promoting long-term survivability for turtles (DFO pers. comm., Canadian swordfish fishery site visit, October 2016).</p> <p>In summary, the information available is that the fishery is responsible for an estimated 5-15 adult equivalent loggerhead sea turtle mortalities per year (or 0.04 – 0.12% of the total annual adult equivalent mortalities), and noting that Intertek Moody Marine (2012) stated in the original PCR that, <i>“It is highly unlikely that the assessed candidate fishery is the cause of the endangered status of the species”</i>, together with the information on observer coverage and turtle release training supports a conclusion that, <i>“Direct effects are highly unlikely to create unacceptable impacts to ETP species”</i>, so meeting the SG80 requirements. Therefore, the Condition on PI 2.3.1 is closed.</p>
7. By the first surveillance audit, the client must provide evidence that the Loggerhead sea Turtle Conservation Action Plan (LCAP) is in place for managing the fishery's impact on ETP species, including measures to minimize mortality, that is designed to be highly likely to achieve national and international requirements for the protection of ETP species. Additionally by the fourth surveillance audit evidence must be presented to show that the strategy is being	2.3.2	Year 3	<p>The audit team is satisfied that there is a strategy in place (the Loggerhead sea Conservation Action Plan) for managing the fishery's impact on ETP species, including measures to minimize mortality, that is designed to be highly likely to achieve national and international requirements for the protection of ETP species. Evidence to now support this including the client's submission for the Year 3 audit, the information presented in the updated “Workplan to Address Incidental Catch in the Atlantic Canadian Swordfish/ Other Tuna Longline Fishery” and the terms of reference for the upcoming Regional Peer Review (“Assessment of Incidental Catch in the Atlantic Canadian Swordfish/ Other Tuna Longline Fishery”), scheduled for February 2016.</p> <p>The audit team is satisfied that that LCAP is being implemented successfully as evidenced by changes in license conditions, new and continued research activity as well as continued monitoring. The outcome of the strategy's success is evaluated under Conditions 6 and 8.</p>

Condition	PI	Year closed	Justification
implemented successfully.			
8. By the fourth surveillance audit, the client must present information considered sufficient to determine whether the fishery poses a threat to protection and recovery of the ETP species, specifically loggerhead sea turtle. Information must be sufficient to not only measure trends but also to support a full strategy to manage impacts.	2.3.3	Year 4	In summary, together with the information already available on the annual number of interactions with loggerhead sea turtles at 5-15 adult equivalent mortalities per year (or 0.04 – 0.12% of the total annual adult equivalent mortalities), and noting that Intertek Moody Marine (2012) stated in the original PCR that, “ <i>It is highly unlikely that the assessed candidate fishery is the cause of the endangered status of the species</i> ”, the information on observer coverage and turtle release training supports a conclusion that, “ <i>Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a full strategy to manage impacts</i> ”, so meeting the SG80 requirements. Therefore, the Condition on PI 2.3.3 is closed.
9. By the third surveillance audit, evidence that clear long-term objectives which guide decision- making, are consistent with MSC Principles and Criteria, and the precautionary approach, must be explicit within the Canadian longline swordfish management policy.	3.1.3	Year 4	This condition was rescored at 80 and closed at the 2014 annual audit by the Intertek audit team (Intertek 2014). However, the audit team for the overlapping certified US swordfish longline fishery did not agree that the desired outcome had been achieved and so did not close their same condition. A consensus between the two audit teams was not achieved at the 2014 or 2015 audit cycles and so this condition was left open in order that it could be reviewed and considered as part of the MSC harmonisation meeting described in section 2.2.2 in this audit report. The meeting concluded that the SG 80 had been met and therefore this condition was closed.
10. By the third surveillance audit, evidence that clear long-term objectives which guide decision- making, are consistent with MSC Principles and Criteria, and the precautionary approach, must be explicit within the Canadian longline swordfish	3.2.2	Year 2	The IFMP documents a domestic fishery management approach that is consistent with MSC Principles. The precautionary approach is an explicit management policy. In the plan, it is described as a “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.” ICCAT adopted a Recommendation on the Principles of Decision Making for ICCAT Conservation and Management Measures (REC 11-13 GEN). It guides the development of management measures for ICCAT managed stocks in a manner consistent with the

Condition	PI	Year closed	Justification
management policy.			<p>precautionary approach. It states that “For stocks that are overfished and subject to overfishing (i.e., stocks in the red quadrant of the Kobe plot), the Commission shall immediately adopt management measures ... designed to result in a high probability of ending overfishing in as short a period as possible. In addition, the Commission shall adopt a plan to rebuild these stocks taking into account, <i>inter alia</i>, the biology of the stock and SCRS advice”.</p> <p>The Audit Team is aware that implementation of the domestic and international policies described above is imperfect. For example, some Canadian stocks are at population levels below limit reference points (but not swordfish) and actual catches sometime exceed scientific advice and allowable catch limits. Also, some of the frameworks and policy documents noted above are still under development. However, it is unrealistic to expect perfect implementation especially for situations where information is limited and responsibility for conservation and management is shared with several other countries. Views and experience addressing policies like the precautionary approach and issues like bycatch are evolving and thus is to be expected that conservation and management policy is a work in progress.</p> <p>The SG 80 score does not require perfect implementation of the principles described above and it does not require that policies are complete and final. The 3rd issue of the 80 scoring guidepost (the one that prompted condition 10) requires decision-making processes use the precautionary approach, which is the case.</p>
11. By the second surveillance audit the client, in cooperation with the management body, must have in place a research plan which provides a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC Principles 1 and 2, in particular with respect to the fisheries interaction and impact on ETP species. While there is a research plan in place, it is focused on	3.2.4	Year 2	<p>The NSSA provided a document titled “Work Plan to Address Incidental Catch in the Atlantic Canadian Swordfish/Other Tuna Longline Fishery.” This is a DFO work plan for 2014-2015 projects. The Audit Team confirmed with DFO officials that the projects are funded under the Agency’s current budget plan.</p> <p>The work plan addresses the level of observer coverage, discard management, survival of released bycatch, incorporation of discard information in stock assessments, mitigation, and loggerhead sea turtle recovery potential A brief description of the projects, their status and a time horizon for deliverables is provided in the plan.</p> <p>A condition was placed on the fishery because evidence of a research plan that addressed the needs for objectives consistent with Principle 2 was inadequate. The research work plan discussed above addresses research needs for Principle 2 species.</p> <p>Therefore, PI 3.2.4 is rescored to 80 and the condition is closed.</p>

Condition	PI	Year closed	Justification
Principle 1 related issues, and there is minimal research on methods for reducing longline interactions with endangered, threatened and protected species. As such, to meet the 80SG, a research plan to reduce longline interactions with ETP species shall be designed and implement by the fishing industry in cooperation with DFO.			

4.3 Assessment Methodologies

This re-assessment was conducted using the MSC Certification Requirements (CR) version 1.3 (MSC 2013b) default assessment tree with no changes made to the text of any default Performance Indicator (PI). The assessment followed CR version 2.0 process (MSC 2014). The report has been presented using the MSC Full Assessment Reporting Template version 2.0. The risk-based framework (RBF) was not used in this re-assessment.

4.4 Evaluation Processes and Techniques

4.4.1 Site Visit

The re-assessment was announced on the MSC website:

<https://fisheries.msc.org/en/fisheries/north-west-atlantic-canada-longline-swordfish/@assessments>, and stakeholders that participated in the original assessment and annual audits were contacted directly by the CAB.

The re-assessment was combined with the 4th annual surveillance audit for the longline swordfish fishery and 6th annual surveillance audit for the harpoon swordfish fishery.

The site visit was held in Halifax & Dartmouth, Nova Scotia, Canada, the week commencing 3rd October 2016.

4.4.2 Consultations & meetings

4 th October 2016, 1801 Hollis Street, Halifax, Nova Scotia		
Name	Organisation	Role
Paul Knapman	Acoura Audit Team Member	Team Lead and P3 Specialist
Kevin Stokes	Acoura Audit Team Member	P1 Specialist
Rob Blyth-Skyrme	Acoura Audit Team Member	P2 Specialist
Troy Atkinson	NSSA	Client representative
Dale Richardson	Swordfish Harpoon Quota Society	Client representative

4 th October 2016, Ecology Action Centre Offices, Halifax		
Name	Organisation	Role
Paul Knapman	Acoura Audit Team Member	Team Lead and P3 Specialist
Kevin Stokes	Acoura Audit Team Member	P1 Specialist
Rob Blyth-Skyrme	Acoura Audit Team Member	P2 Specialist
Heather Grant	Ecology Action Centre	Marine Campaigner
Katie Schleit	Ecology Action Centre	Marine Coordinator
Shannon Arnold	Ecology Action Centre	Marine Coordinator

5 th October 2016, Bedford Institute of Oceanography, Dartmouth		
Name	Organisation	Role
Paul Knapman	Acoura Audit Team Member	Team Lead and P3 Specialist
Kevin Stokes	Acoura Audit Team Member	P1 Specialist
Rob Blyth-Skyrme	Acoura Audit Team Member	P2 Specialist
Mark Comley	DFO	Chief, Program & Operational Readiness
Margaret Lever	DFO	Staff Officer C & P

5 th October 2016, Bedford Institute of Oceanography, Dartmouth		
Name	Organisation	Role
Carl MacDonald	DFO	Regional Manager/Resource Management
Troy Atkinson	NSSA	Client representative
Heather Bowlby	DFO	Shark specialist
Thomas Wheaton	DFO	Science Coordinator
Alex Dalton	DFO	Aquatic Biologist Large Pelagics
Terry Higgins	DFO	Record Keeper
Colleen Smith	DFO	MSC Coordinator
Scott Coffen-Smout	DFO	Ecosystem Management
Marilyn Sweet	DFO	Resource Management
Mike James	DFO	Sea Turtle Science
Aimee Gromack	DFO	Ecosystem Management
Brian Lester (Participated by phone)	DFO	Assistant Director – Resource Management

A site visit to Sambro harbour was undertaken with the NSSA representative and a longline swordfish vessel and fishing gear inspected.

The main activities and issues that were discussed, reviewed and inspected on the site visit included:

- Vessels and area of targeted fishery
- The stock status
- Current performance of the fishery
- Canada's participation in ICCAT
- Application of DFO harvest control measures
- The IFMP
- Scientific research
- New scientific staff
- Internal / external review of the fishery
- Observer programme
- Bycatch information, including information on ETP species
- Bait species
- Policy and management changes
- Interest in the fishery from other stakeholders
- Traceability, including the dockside monitoring programme, landing points, hail-out and hail-in requirements, logbooks
- The status of MPAs, including EBSAs and VMEs
- The Conservation and Protection programme, including levels of monitoring and compliance, licence conditions
- SFPAC and ALPAC meetings
- Status of DFO / ENGO forum

4.4.3 Evaluation Techniques

Several sources of information provided the basis of the conclusions of this assessment, including a review of information and references provided by the client prior to the site visit, information and data sourced during site visit meetings held with stakeholders involved with the fishery, and review of literature and information provided following site visit meetings. Peer review and stakeholder comment on the draft report also provide a very important contribution to the assessment process.

The MSC Principles and Criteria set out the requirements for sustainable fishing. These Principles and Criteria have subsequently been used to develop a standardized, default

assessment tree (within the MSC Certification Requirements), including Performance Indicators (PIs) and Scoring Issues (SIs), by the MSC and its advisory boards, which have been used in the assessment of this fishery.

Each SI may be scored at three scoring guideposts (SGs), which define the level of performance that is required to achieve 100, 80 (the passing score), and 60 scores; 100 represents a theoretically ideal level of performance and 60 a measurable shortfall. If a fishery does not meet the minimum SG 60 level of performance for any SI, the fishery would fail its assessment.

For each PI, the performance of the fishery is evaluated, and a score issued. In order for the fishery to achieve certification, an overall weighted average score of 80 is necessary for each of the three Principles and no SI should score less than 60. Scores are issued using a minimum increment of five. Average scores for each Principle are rounded to one decimal place.

Following the review and synthesis of information available, the assessment team discussed each individual SI to assess whether the evidence is present to assess the level of performance that the fishery achieved. Justification of the scoring is provided in the scoring table presented in Appendix 1. Scores were agreed by consensus between the assessment team.

The elements that were scored for each PI under Principle 1 and 2 are listed in Table 12, below. Scores allocated for each PI were entered into the MSC Fishery Assessment Scoring Worksheet in order to attain the overall Principle scores; these scores are shown in section 6.2 of this report.

Table 12. Scoring elements

Component	Scoring elements		Main / Minor	Data-deficient (Yes / No)
P1 - Outcome	Swordfish	<i>Xiphias gladius</i>	Main	No
P2 – Retained species	Bigeye tuna	<i>Thunnus obesus</i>	Main	No
	Bluefin tuna	<i>Thunnus thynnus</i>	Main	No
	Shortfin mako	<i>Isurus oxyrinchus</i>	Minor	No
	Yellowfin tuna	<i>Thunnus albacares</i>	Minor	No
	Albacore tuna	<i>Thunnus alalunga</i>	Minor	No
	Argentine squid (bait)	<i>Illex argentinus</i>	Main	No
	Chub mackerel (bait)	<i>Scomber japonicus</i>	Main	No
	Atlantic mackerel (bait)	<i>Scomber scombrus</i>	Minor	No
P2 - Bycatch	Blue shark	<i>Prionace glauca</i>	Main	No
	Porbeagle shark	<i>Lamna nasus</i>	Minor	No
	Common thresher shark	<i>Alopias vulpinus</i>	Minor	No
	White marlin	<i>Kajikia albidus</i>	Minor	No
P2 - ETP	Leatherback turtle	<i>Dermochelys coriacea</i>	N/A	No
	Loggerhead sea turtle	<i>Caretta caretta</i>	N/A	No
P2 - Habitat	None		None	No
P2 - Ecosystem	Northwest Atlantic pelagic ecosystem structure and function		N/A	No

5 Traceability

5.1 Eligibility date

The eligibility date for this fishery is 30th September 2017. This is when the existing certification of the fishery ends. Assuming the fishery is re-certified, a new certificate will be issued on this date allowing for an unbroken period of certification for the fishery.

5.2 Traceability within the fishery

The specific scope of this full certification re-assessment is the harvest of swordfish, within the Atlantic Canadian EEZ and in the international waters within the ICCAT Northern Swordfish Boundary Area (North of 5°N and west of 30°W) by Canadian licensed pelagic longline vessels that are members of the NSSA.

The NSSA represents all longline licences in the longline fishery. The fishery overlaps with the Canadian harpoon swordfish fishery (already certified and also in re-assessment) and with high seas swordfish fisheries from other countries.

If successfully re-certified, a list of licensed longline vessels eligible to land certified product will be provided by the NSSA to the CAB.

5.2.1 Points of landing

Swordfish caught in the Canadian pelagic longline fishery must be offloaded at wharf facilities which have been authorized by DFO, primarily for the purpose of accessibility. All swordfish trip landings, even when no fish are landed, must be hailed into a dockside monitoring contractor for entry into the DFO electronic fisheries monitoring system. A list of Principle ports of landing in the Atlantic Region include Shelburne, Sambro, Wood's Harbour and Clark's Harbour in Nova Scotia, and St. John's and Fermeuse in Newfoundland & Labrador DFO registered wharves in Atlantic Canadian provinces (Newfoundland and Labrador, Nova Scotia, Prince Edward Island, New Brunswick and Quebec can be found at: <http://www.dfo-mpo.gc.ca/sch-ppb/list-liste-eng.htm>).

All swordfish landings must be verified by independent dockside monitoring contractors who confirm species, quantity and weight of product offloaded and verify completion of required fishing logs which identifies geographic harvest location. In addition, the longline sector is subject to a recommended minimum of 5% at-sea observer coverage. When on-board, observers verify the quantity and composition of catch, effort, and location data. These requirements are common for all licensed harvesters without exception.

In order for subsequent links in the distribution chain to be able to use the MSC logo, swordfish products must enter into a separate chain of custody certification from the point of landing forward. The subsequent links must be able to prove that they can track the swordfish harpoon product back to the permitted vessels which landed the product or to the primary processing facility which initially received the product.

5.2.2 At-sea processing

There is no at-sea processing within the fishery under consideration. Swordfish is cleaned and iced at sea for delivery as headed and gutted product.

5.2.3 Shore-based processing

Shore-based processing is limited, the fish are usually shipped whole however, in some instances they can be portioned and steaked before exporting.

Table 13 Traceability factors within the fishery

Traceability Factor	Description of risk factor if present. Where applicable, a description of relevant mitigation measures or traceability systems (this can include the role of existing regulatory or fishery management controls)
Potential for non-certified gear/s to be used within the fishery	Two types of gear are used to catch swordfish: pelagic longline and harpoon. All vessels licensed to fish with longline can fish with harpoon but, when doing so, are not allowed to carry longline gear aboard the vessel. Vessels are subject to shore and sea-based inspections. Therefore, the risk of non-certified gears being used in the fishery is negligible.
Potential for vessels from the UoC to fish outside the UoC or in different geographical areas (on the same trips or different trips)	To the east of the UoC, the size of vessels used in the fishery is a restricting factor with respect to fishing outside of the UoC. To the west, the risk of being caught and heavily penalised for fishing within US waters is considered to be too high and so acts as a good deterrent. Therefore, the potential for vessels to fish outside of the UoC is considered to be negligible.
Potential for vessels outside of the UoC or client group fishing the same stock	North Atlantic swordfish are a highly migratory species and so vessels from other ICCAT Contracting Parties do fish the same stock. However, no other Contracting Parties land their swordfish catch into Canadian ports and so there is considered to be no risk of uncertified fish from outside the UoC entering the chain of custody.
Risks of mixing between certified and non-certified catch during storage, transport, or handling activities (including transport at sea and on land, points of landing, and sales at auction)	MSC chain of custody certifications have been in place for the swordfish fishery since the fishery was first certified in 2012. No instances of irregularities were reported by the chain of custody certifier. Swordfish landings are inspected and verification checks made on gear, fishing area, etc. Landings do not go to an auction but are all exported to the US. All Canadian licensed longline Atlantic swordfish vessels are members of the client group. Therefore, there is considered to be negligible risk of mixing between certified and non-certified catch during storage, transport or handling.
Risks of mixing between certified and non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody)	The catch is headed, gutted and iced at sea. It is easily identifiable if mixed with other retained species. Minimal processing takes place ashore. The fish is usually exported as a carcass. Portioning or steaking can take place but swordfish meat remains visually identifiable. Therefore, there is negligible risk of mixing between certified and non-certified catch during processing activities.
Risks of mixing between certified and non-certified catch during transshipment	Transshipping is not permitted in the fishery.

Traceability Factor	Description of risk factor if present. Where applicable, a description of relevant mitigation measures or traceability systems (this can include the role of existing regulatory or fishery management controls)
Any other risks of substitution between fish from the UoC (certified catch) and fish from outside this unit (non-certified catch) before subsequent Chain of Custody is required	No other risks of substituting certified and non-certified catch are considered likely within this fishery.

5.3 Eligibility to Enter Further Chains of Custody

The scope of this certification ends at the first point of landing. Downstream certification of the product will require appropriate certification of storage and handling facilities at these locations.

In order for subsequent links in the distribution chain to be able to use the MSC logo, the swordfish products must enter into a separate chain of custody certification from the point of landing forward.

The subsequent links must be able to prove that they can trace the swordfish longline product back to the permitted vessels which landed the product or to the primary processing facility which initially received the product.

6 Evaluation Results

6.1 Principle Level and Performance Indicator Scores

The final scores for the three Principles are provided in Table 14, below, while the final scores for the thirty Performance Indicators that were scored are provided in Table 15, also below.

Table 14: Final Principle scores

Principle	Score
Principle 1 – Target Species	83.8
Principle 2 – Ecosystem	87.3
Principle 3 – Management System	81.9

Table 15: Final Performance Indicator scores

Principle	Component	Performance Indicator (PI)		Score
1	Outcome	1.1.1	Stock status	90
		1.1.2	Reference points	80
		1.1.3	Stock rebuilding	n/a
	Management	1.2.1	Harvest strategy	80
		1.2.2	Harvest control rules & tools	80
		1.2.3	Information & monitoring	80
		1.2.4	Assessment of stock status	90
2	Retained species	2.1.1	Outcome	90
		2.1.2	Management	85
		2.1.3	Information	90
	Bycatch species	2.2.1	Outcome	80
		2.2.2	Management	85
		2.2.3	Information	85
	ETP species	2.3.1	Outcome	85
		2.3.2	Management	85
		2.3.3	Information	80
	Habitats	2.4.1	Outcome	100
		2.4.2	Management	95
		2.4.3	Information	95
	Ecosystem	2.5.1	Outcome	90
		2.5.2	Management	80
		2.5.3	Information	85
3	Governance and policy	3.1.1	Legal & customary framework	85
		3.1.2	Consultation, roles & responsibilities	90
		3.1.3	Long term objectives	80
		3.1.4	Incentives for sustainable fishing	80
	Fishery specific management system	3.2.1	Fishery specific objectives	80
		3.2.2	Decision making processes	75
		3.2.3	Compliance & enforcement	90
		3.2.4	Research plan	80
		3.2.5	Management performance evaluation	75

6.2 Summary of Conditions

PIs 3.2.2 and 3.2.5 did not achieve an unconditional pass mark, therefore binding conditions are placed on the fishery. A full explanation of these conditions is provided in Appendix 2 of the report, but in brief, the areas covered by these conditions relate to: How the precautionary approach is used in decision-making processes for non-commercial species; and, the requirement to have occasional external reviews of the Canadian longline swordfish fishery.

Table 6: Summary of Conditions

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/NA)
1	By the third audit the client shall provide evidence of how the precautionary approach is, or is not necessarily, being used with respect to the fisheries interaction with turtle species in the decision-making processes within the Canadian longline swordfish fishery.	3.2.2	Y
2	By the third annual audit the client shall provide evidence that the longline swordfish fishery management system is subject to regular internal and occasional external review.	3.2.5	N

6.3 Recommendations

Five non-binding Recommendations were made at this reassessment:

- 1) PI 2.2.3, SIc: It is recommended that options to improve the quality and consistency of discard reporting are investigated, and that any feasible approaches are implemented.
- 2) PI 2.3.3, SIa: It is recommended that the client support and pursue a re-running of the Regional Peer Review assessment of incidental catch in the Atlantic Canadian swordfish/other tuna longline fishery (i.e., DFO 2016k), or a similar process, to review the approach to incidental catch monitoring in the longline swordfish fishery. A key aim should be to determine what, if any, changes are needed to the observer programme to ensure that the data collected are adequately representative of the fishery.
- 3) PI 2.3.3, SIb: A non-binding Recommendation was set in the Year 4 audit report for the last certification period (Knapman et al. 2017). This was that the client provide DFO with clear and well publicised support for the timely completion of the loggerhead sea turtle tagging study through advocating to the swordfish longline fishermen of the need to identify and fulfil suitable opportunities to take DFO tagging staff on swordfish and combined swordfish and tuna longline trips in 2017. This non-binding Recommendation is repeated here, and will be reiterated annually until such time as the study is completed.
- 4) PI 2.4.3, SIb: It is recommended that information on the amounts and locations of any lost gear (i.e., number of hooks and floats, length of mainline, etc.) are recorded centrally and reported annually.
- 5) PI 3.2.2., SIa: It is noted that the IFMP is out of date. It is recommended that the IFMP is updated annually and, in so doing, a record of amendment is maintained in order to show changes.

6.4 Determination, Formal Conclusion and Agreement

(REQUIRED FOR FR AND PCR)

1. The report shall include a formal statement as to the certification determination recommendation reached by the Assessment Team about whether or not the fishery should be certified.

(Reference: FCR 7.16)

(REQUIRED FOR PCR)

2. The report shall include a formal statement as to the certification action taken by the CAB's official decision-makers in response to the Determination recommendation.

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Appendix 1: Scoring & Rationale

MSC Principles & Criteria

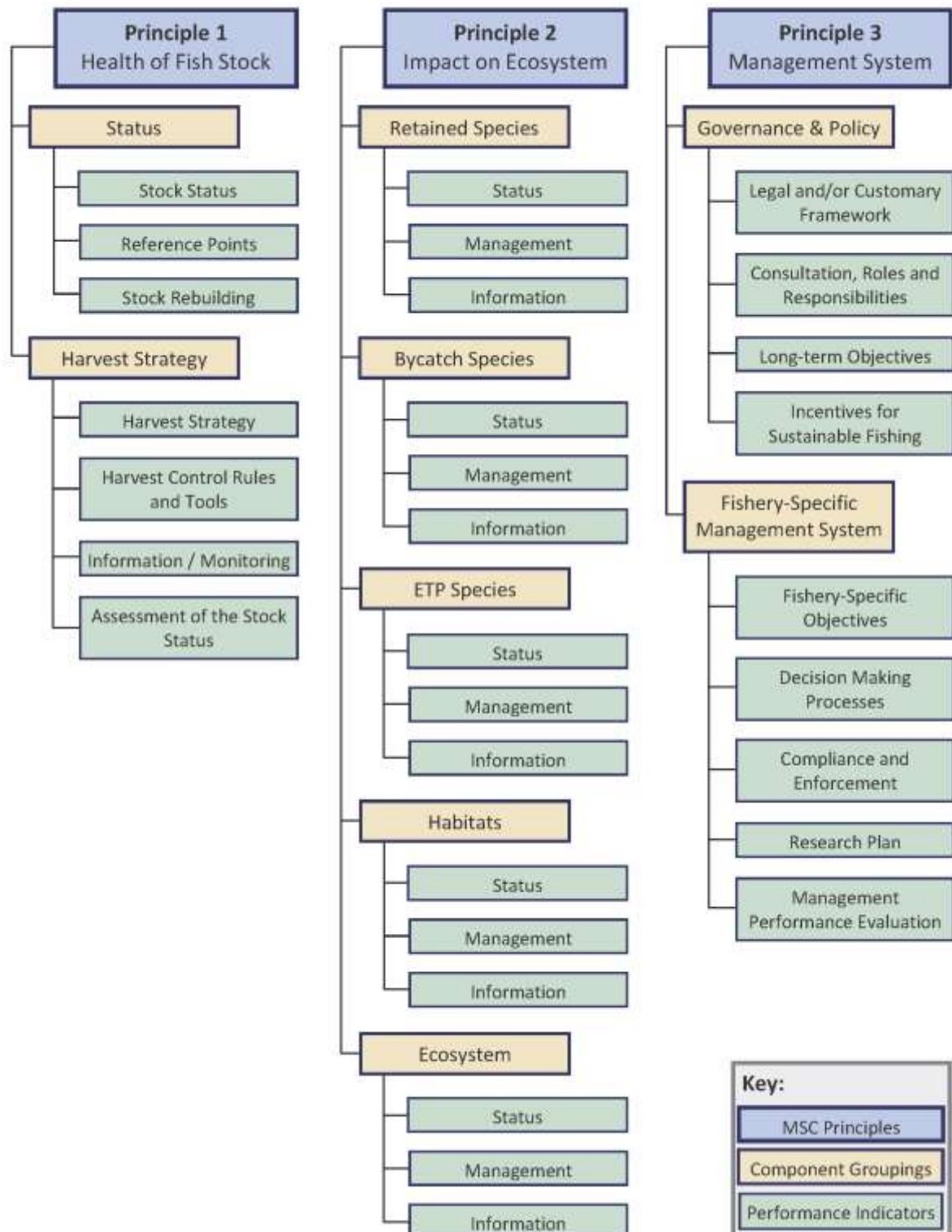


Figure 11. Graphic of MSC Principles and Criteria

Below is a much-simplified summary of the MSC Principles and Criteria, to be used for over-view purposes only. For a fuller description, including scoring guideposts under each Performance Indicator, reference should be made to the full assessment tree, complete with scores and justification, contained in the following sections of this report. Alternately a fuller description of the MSC Principles and Criteria can be obtained from the MSC website (www.msc.org).

Principle 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

Intent:

The intent of this Principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favour of short-term interests. Thus, exploited populations would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Status

- » The stock is at a level that maintains high productivity and has a low probability of recruitment overfishing.
- » Limit and target reference points are appropriate for the stock (or some measure or surrogate with similar intent or outcome).
- » Where the stock is depleted, there is evidence of stock rebuilding and rebuilding strategies are in place with reasonable expectation that they will succeed.

Harvest strategy / management

- » There is a robust and precautionary harvest strategy in place, which is responsive to the state of the stock and is designed to achieve stock management objectives.
- » There are well defined and effective harvest control rules in place that endeavour to maintain stocks at target levels.
- » Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.
- » The stock assessment is appropriate for the stock and for the harvest control rule, takes into account uncertainty, and is evaluating stock status relative to reference points.

Principle 2

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends

Intent:

The intent of this Principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

Retained species / Bycatch / ETP species

- » Main species are highly likely to be within biologically based limits or if outside the limits there is a full strategy of demonstrably effective management measures.
- » There is a strategy in place for managing these species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species.
- » Information is sufficient to quantitatively estimate outcome status and support a full strategy to manage main retained / bycatch and ETP species.

Habitat & Ecosystem

- » The fishery does not cause serious or irreversible harm to habitat or ecosystem structure and function, considered on a regional or bioregional basis.
- » There is a strategy and measures in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.
- » The nature, distribution and vulnerability of all main habitat types and ecosystem functions in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery and there is reliable information on the spatial extent, timing and location of use of the fishing gear.

Principle 3

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

Intent:

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

Governance and policy

- » The management system exists within an appropriate and effective legal and/or customary framework that is capable of delivering sustainable fisheries and observes the legal & customary rights of people and incorporates an appropriate dispute resolution framework.
- » Functions, roles and responsibilities of organisations and individuals involved in the management process are explicitly defined and well understood. The management system includes consultation processes.
- » The management policy has clear long-term objectives, incorporates the precautionary approach and does not operate with subsidies that contribute to unsustainable fishing.

Fishery specific management system

- » Short and long term objectives are explicit within the fishery's management system.
- » Decision-making processes respond to relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner.
- » A monitoring, control and surveillance system has been implemented. Sanctions to deal with non-compliance exist and there is no evidence of systematic non-compliance.
- » A research plan provides the management system with reliable and timely information and results are disseminated to all interested parties in a timely fashion.

Performance Indicator Scores and Rationale

Evaluation Table for PI 1.1.1

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	Y	Y	Y
	Justification	<p>The most recent stock assessments for North Atlantic swordfish are reported in ICCAT (2013), with status estimated as of 2011. The most recent advice on status, outlook, and management is given in ICCAT (2015) which takes account of catches since 2011 and provides status estimates for 2013 and beyond based on projections from the 2013 assessment. Three assessment approaches were used (see PI 1.2.4), with reporting on two stock production models. Multiple sensitivity tests were conducted for all assessment approaches. The base case used for reporting uses the ASPIC model with assumed Schaefer dynamics.</p> <p>The assessment results suggest that in 2011, the stock was above B_{MSY} with 90% probability, implying there is a high degree of certainty that in 2011 it was above the point where recruitment would be impaired, taken here as the default MSC LRP of $0.5B_{MSY}$ (CR v1.3 CR 2.3.3.3).</p> <p>The outlook statement in ICCAT (2015) clearly indicates that the stock is estimated in 2015 to have a greater than 90% probability of being above B_{MSY} and that at constant future annual catches of 13,700 mt, would remain above B_{MSY} with 83% probability over the next decade. However, if annual catches reach 15,000 mt the probability of falling below B_{MSY} increases to over 50%.</p> <p>Taken as a whole, in 2016, the stock is estimated to be above the point where recruitment might be impaired with a high degree of certainty. SG100 is met.</p>		
b	Guidepost		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.
	Met?		Y	N
	Justification	<p>The most recent stock assessments for North Atlantic swordfish are reported in ICCAT (2013), with status estimated as of 2011. The most recent advice on status, outlook, and management is given in ICCAT (2016) which takes account of catches since 2011 and provides status estimates for 2013 and beyond based on projections from the 2013 assessment. Three assessment approaches were used (see PI 1.2.4), with reporting on two stock production models. Multiple sensitivity tests were conducted for all assessment approaches. The base case used for reporting uses the ASPIC model with assumed Schaefer dynamics.</p> <p>CB2.2.2.1 states that at SG80, there shall be evidence that the stock is at the target reference point now or has fluctuated around the target reference point for the past few years. The 2013 assessment shows that the lower 80% confidence bound of stock biomass was at the TRP, taken as B_{MSY} (see PI1.1.2), in 2009-10 and</p>		

		increased above this level in 2011 (Figure 12 ICCAT 2013). The most recent advice on status and outlook, with consideration of catches since the last assessment, (ICCAT 2016) indicates that the stock biomass continued to increase after 2011. The stock has therefore been at or fluctuating around its target reference point for the past few years. SG80 requirements are met.	
		To meet SG100 there needs to be a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years. CB2.2.1.3 defines a high degree of certainty as 95%. CB2.2.2.2 clarifies “over recent years” as meaning for a period longer than the past few years (the standard for SG80). The 2013 stock assessment and the 2015 update advice indicate that the stock had rebuilt from below the TRP to the TRP in 2007, and has continued to increase since then. However, the most recent estimate of biomass from the stock assessment is in 2011. The update in 2015 did not use a revised stock assessment but is based on projections accounting for catches since the 2013 assessment. A new assessment is planned for 2017. There is evidence that the stock size has been above the TRP for several years, but not with a high degree of certainty. SG100 requirements are therefore not met.	
References		ICCAT (2013) Report of the 2013 Atlantic Swordfish Stock Assessment Session. Doc. No. SCI-036/2013 https://www.iccat.int/Documents/Meetings/Docs/2013_SWO_ASSESS_REP_ENG.pdf ICCAT (2016) Report of the Standing Committee on Research and Statistics (SCRS) PLE 1 2016 http://www.iccat.org/Documents/Meetings/Docs/2016_SCRS_ENG.pdf	
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Target reference point	B _{current} /B _{MSY} Where B _{MSY} is model defined as 0.5K	B _{MSY} (2011) = 65,060t (+/- 80% range of 54,450-76,600t)	In 2011: 1.14 (+/- 80% range of 1.05-1.24) Based on Table 19 of ICCAT (2013) In 2013: Above B _{MSY} with 90% probability. Based on ICCAT (2016) Outlook statement
Limit reference point	0.5B _{MSY} MSC default (CR v1.3 CR2.3.3.3)	As above	Not provided but given status relative to TRP, very high probability of being above default LRP
OVERALL PERFORMANCE INDICATOR SCORE: SI(a): 100; SI(b): 80			90
CONDITION NUMBER (if relevant):			N/A

Evaluation Table for PI 1.1.2

PI 1.1.2		Limit and target reference points are appropriate for the stock		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	Y	Y	
	Justification	<p>The key reference point used is stock biomass as a proportion of B_{MSY}. B_{MSY} is estimated analytically using a range of models subject to sensitivity testing (see PI 1.2.4) with appropriate data inputs and model fitting using a range of appropriate diagnostics. Assessments are not conducted annually but outlook updates of the stock relative to B_{MSY} are provided by considering projections given updated catch estimates. The reference points used are appropriate for the stock and can be (and are) estimated.</p> <p>SG60 and SG80 requirements are met.</p>		
b	Guidepost		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	Met?		Y	N
	Justification	<p>ICCAT is yet to establish by Recommendation or Resolution an explicit LRP for North Atlantic swordfish. However, CR v1.3 CB2.3.2.1 allows for the use of an implicit LRP (and TRP) for managing the stock. ICCAT (2015) Recommendation 15-07 is on the development of HCR (see also PI 1.2.2) and includes specifications for the SCRS to advise the Commission on setting, amongst other things, LRPs for all stocks, including a 5-year schedule for the establishment of species-specific HCRs. At this stage, therefore, ICCAT planning for HCR development, including LRP, TRP and other settings, is well developed and in-train.</p> <p>Management action on North Atlantic swordfish relates to ensuring the stock is at or above the objectives laid out in the Convention; that is, B_{MSY} (see also PI 1.1.2). This is well exemplified in ICCAT (1999) Recommendation 99-02 which established a rebuilding program for NA swordfish when the stock was estimated to be at $0.65 B_{MSY}$ and with fishing mortality estimated as $1.34F_{MSY}$. The Commission adopted rigorous measures (catch reductions and various technical measures) and has followed through since that time to ensure rebuilding, with the stock currently above B_{MSY} with a high probability (see PI 1.1.1), going beyond the rebuilding objective of achieving B_{MSY} with a greater than 50% probability.</p> <p>The Commission introduced rebuilding measures in response to stock and fishing mortality status estimates, effectively treating either or both of those estimates as triggers, or thresholds for action. The trigger was to rebuild to meet Convention objectives but implicitly also to avoid further stock decline. These 1999 status estimates might generally be interpreted as management threshold reference points but it is not unreasonable here to treat them as LRPs which the Commission</p>		

		<p>sought to avoid with a high probability by rebuilding to B_{MSY} within a specified timeframe and taking appropriate, sustained action to meet that goal.</p> <p>This is further emphasized by Recommendation 13-02 by ICCAT for the Conservation of North Atlantic Swordfish (ICCAT, 2013b) which at paragraph 5 states: The SCRS and the Commission shall begin a dialogue to allow for the development of harvest control rules (HCRs) for consideration in any subsequent recommendations. Further, while the HCRs are being developed, should the biomass approach the level which triggered the establishment of the previous rebuilding plan [Rec 99-02] then management measures should be considered to avoid further decline and begin to rebuild the stock.</p> <p>The MSC CR v1.3 CB2.3.3. paragraphs do not easily cover default reference points when B_{MSY} is defined by the model but not, as such, analytically determined. The common interpretation, however, for stocks other than low productivity ones, is that a default LRP of $20\%B_0$ is adequate for SG80 scoring. The trigger level of $0.65B_{MSY}$ is by definition $33.66\%B_0$, exceeding the MSC requirements.</p> <p>The same Recommendation (13-02), at paragraph 4, states: When assessing stock status and providing management recommendations to the Commission in 2016, the SCRS shall consider the interim limit reference (LRP) of $0.4 \times B_{MSY}$ or any more robust LRP established through further analysis. This paragraph appears to specify a more explicit LRP (as $0.4B_{MSY} = 20\%B_0$) but leaves open options for “more robust” alternatives even within 2016. For purposes of scoring at this time, paragraph 4 is not used, relying on the implied LRP from Recommendation 99-02 and Recommendation 13-02, paragraph 5.</p> <p>SG80 requirements are met.</p> <p>There is no explicit rationale presented in ICCAT documentation that precautionary matters (such as environmental variability, CR2.3.10), were considered when developing the rebuilding plan in 1999.</p> <p>SG100 requirements are not met.</p>		
c	Guidepost		The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	Met?		Y	N
	Justification	<p>The ICCAT Basic Texts (2007) include repeated language reflecting the preambular reference to “maintaining the populations of these fishes at levels which will permit the maximum sustainable catch”. Article VIII states that “The Commission may, on the basis of scientific evidence, make recommendations designed to maintain the populations of tuna and tuna-like fishes that may be taken in the Convention area at levels which will permit the maximum sustainable catch. These recommendations shall be applicable to the Contracting Parties under the conditions laid down in paragraphs 2 and 3 of this Article.”</p> <p>All evidence from SCRS and Commission reports, Recommendations and Resolutions, including rebuilding provisions for North Atlantic swordfish (ICCAT, 1999, Rec 99-2) supports that the ICCAT core objective follows the Basic Texts, with clear use of B_{MSY} as a TRP used in management decisions for swordfish.</p> <p>SG80 requirements are met.</p> <p>There is no explicit rationale presented in ICCAT documentation that the ecological role of the stock, or other precautionary matters, is considered in setting the TRP.</p>		

		SG100 requirements are not met.		
d	Guidepost		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	Met?		Not relevant	
	Justification	Swordfish is not a Low Trophic Level (LTL) species.		
References		<p>ICCAT (2007) The International Convention for the Conservation of Atlantic Tunas (as amended) http://www.iccat.int/Documents/Commission/BasicTexts.pdf</p> <p>ICCAT (1999) Recommendation on Rebuilding Program for North Atlantic swordfish, Rec 99-2 https://www.iccat.int/Documents/Recs/compendiopdf-e/1999-02-e.pdf</p> <p>ICCAT (2013b) Recommendation 13-02 for the Conservation of North Atlantic Swordfish https://www.iccat.int/Documents/Recs/compendiopdf-e/2013-02-e.pdf</p> <p>ICCAT (2015) Recommendation by ICCAT on the Development of Harvest Control Rules and of Management Strategy Evaluation, Rec 15-07 https://www.iccat.int/Documents/Recs/compendiopdf-e/2015-07-e.pdf</p>		
OVERALL PERFORMANCE INDICATOR SCORE: SI(a): 80; SI(b): 80; SI(c): 80; SI(d): N/A				80
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 1.1.3

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Where stocks are depleted rebuilding strategies, which have a reasonable expectation of success, are in place.		Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the specified timeframe.
	Met?	(Y/N)		(Y/N)
	Justification	Not applicable		
b	Guidepost	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time. For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	A rebuilding timeframe is specified for the depleted stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the depleted stock.
	Met?	(Y/N)	(Y/N)	(Y/N)
	Justification	Not applicable		
c	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within a specified timeframe.	There is evidence that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a specified timeframe.	
	Met?	(Y/N)	(Y/N)	
	Justification	Not applicable		

PI 1.1.3	Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe	
References		
OVERALL PERFORMANCE INDICATOR SCORE:		N/A
CONDITION NUMBER (if relevant):		N/A

Evaluation Table for PI 1.2.1

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Y	Y	N
	Justification	<p>The harvest strategy consists of an objective (B_{MSY}), annual monitoring (of catch and CPUE) and assessment (either full or update by the SCRS) of biomass and fishing mortality and setting of TACs, catch limits, and other measures by the Commission to achieve the objective. An implicit LRP can be inferred from rebuilding measures started in 1999 (see PI 1.1.2). The strategy of setting quotas to achieve the target biomass over the long term has maintained the stock above the MSC default limit reference point ($0.5B_{msy}$) and has rebuilt the stock to well above B_{MSY}. Continued use of the strategy would be expected to ensure this continues.</p> <p>SG60 requirements are met.</p> <p>The Commission has set annual TACs consistent with the advice of the SCRS. The most dramatic example of this is the implementation of the 10-year rebuilding plan in 1999 (ICCAT, 1999) in response to SCRS-assessed declines in stock biomass. This resulted in reductions in TACs until signs of stock recovery in 2003, at which time the TACs were permitted to increase. Therefore, as the stock conditions changed, the TACs of the rebuilding plan were amended to respond to these changes.</p> <p>SG80 requirements are met.</p> <p>The strategy is responsive to the state of the resource with, since late 2016 an adoption of Recommendation 2016-03 (ICCAT, 2016a) a specification for actions to be taken if the stock falls to a specified trigger point (see PI 1.2.2a). While the strategy is intended to achieve the target B_{MSY}, it is not fully specified or designed as a clear set of rules. This is reflected by the agreement of ICCAT to develop HCR using Management Strategy Evaluation (MSE), effectively to 'design' a strategy to achieve explicit objectives reflected in specified LRP and TRP (see PI 1.2.2).</p> <p>SG100 requirements are not met</p>		
b	Guidepost	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	Y	N

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Justification	<p>The SCRS carries out stock assessments based on fisheries-dependent data, and provides advice to the Commission relative to B_{MSY}. The SCRS evaluates management measures in place and recommends changes as required to meet management objectives. In the case of swordfish, this advice has been used to set TACs and other measures. Since 1999 the stock has rebuilt and been maintained above B_{MSY} (see PI 1.1.1).</p> <p>SG60 and SG80 requirements are met.</p> <p>There is no evidence that the harvest strategy has been evaluated. ICCAT has agreed to develop HCR using Management Strategy Evaluation (MSE), effectively to evaluate and design a harvest strategy (see PI 1.2.1a).</p> <p>SG100 requirements are not met.</p>		
c	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	<p>Every three to four years, the SCRS undertakes a full assessment of the stock. This includes a review of the catch, fishery dependent indices of abundance, models of historical population size as well as biological reference points. TAC and other management measures are reviewed annually and changed as required. This process provides the monitoring to determine whether or not the strategy is working.</p> <p>The SG60 requirements are met.</p>		
d	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Y
	Justification	<p>The ICCAT SCRS reviews the elements of harvest strategy annually and provides advice to the Commission on whether the strategy has been successful and whether it needs to be changed. The SCRS has regularly reviewed and conducted stock assessments, re-estimated (re-calculated) and re-evaluated the appropriateness of the reference points, and whether the objectives of the Convention are being met. The Commission takes the advice of the SCRS under consideration and agrees binding Recommendations. Recommendations for the management of the North Atlantic swordfish stock have generally been in line with the advice from the SCRS.</p> <p>Neilson et. al. (2013) provides a detailed history of the status of the North Atlantic swordfish stock as assessed by the SCRS and management actions taken by ICCAT to recover the status of the stock, demonstrating how the harvest strategy has been modified over time following the successive reviews of its effectiveness by the SCRS. During the early 1990s when the stock status was both overfished and undergoing overfishing, ICCAT introduced a minimum size limit (Rec 90-02), recommended national quotas (Rec 94-14) and in 1995 resolved that the SCRS would develop a TAC series that allowed a 50% probability of rebuilding to the level of biomass that corresponds to MSY within 5, 10, and 15 years (Res 95-09).</p> <p>During the second half of the decade the stock continued to be in an overfished state, culminating in 1999 with ICCAT setting annual TACs at 10,600 mt in 2000, 10,500 mt in 2001 and 10,400 mt in 2002. By 2002, the stock status was improving, being somewhat overfished ($B = 95\%$ of B_{MSY}) but no longer undergoing overfishing</p>		

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
		<p>($F = 75\%$ of F_{MSY}) and ICCAT set a TAC of 14,000 mt for the years 2003–2005. The SCRS noted additional years of strong recruitment contributing to stock recovery. By 2006 the stock status had improved further to nearly recovered; B near B_{MSY}; $F < F_{MSY}$ since 2001. ICCAT extended the 14,000 mt TAC through 2008 and elected to add 2,690 mt to the TACs during the new management period, which was the unused portion of the United States quota during the 2003–2006 period.</p> <p>This addition brought the recommended TAC to levels that exceeded the scientific recommendations. In 2009, the status was updated to “Recovery plan achieved with $>50\%$ probability”, with estimated $B > B_{MSY}$, $F < F_{MSY}$; $MSY = 13,730$ mt. ICCAT recommended a TAC intended to maintain the stock at or above B_{MSY}.</p> <p>The TAC in 2010 and 2011 was 13,700 mt (Rec. 09-02 and Rec.10-02 respectively), just below the estimated MSY. In 2011 (Rec. 11-02), ICCAT the Commission noted the concern expressed by the SCRS that the allowable country-specific catch levels agreed to in Rec. 10-02 exceeded the 2011 TAC. In 2011 (Rec. 11-02) ICCAT set the annual TACs for 2012 and 2013 at 13,700 mt with added provisions to ensure that any overages would be deducted in subsequent years. In Rec. 11-02 ICCAT also called for the establishment at its 2013 meeting of conservation and management measures for a next three-year period (2014/15/16) on the basis of the SCRS advice resulting from the new stock assessment (in 2013) as well as the ICCAT Criteria for the Allocation of Fishing Possibilities (Rec. 01-25). In 2013 (Rec 13-02) ICCAT set the annual TACs for 2014, 2015 and 2016 at 13,700 mt. The SCRS has scheduled a new stock assessment in 2017.</p> <p>Although there is no evidence that the current harvest strategy as a whole has been evaluated in detail, the annual review and record of changes over time demonstrates that the strategy has achieved its rebuilding objectives. ICCAT has also recognised limitations in the harvest strategy and has agreed to develop an HCR to evaluate and design an explicit and more robust harvest strategy (see PI1.2.2). Therefore, SCRS is in regular discussion with the Commission to develop and further improve assessment methods and evaluate reference points. The harvest strategy is periodically reviewed and improved as necessary. The SG 100 requirements are met.</p>		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	Not relevant. CB 2.5.3 states that this scoring issue shall be scored if the target species is a shark.		
References		<p>ICCAT (1999) Recommendation on Rebuilding Program for North Atlantic swordfish, Rec 99-2 https://www.iccat.int/Documents/Recs/compendiopdf-e/1999-02-e.pdf</p> <p>ICCAT (2015) Recommendation on the development of harvest control rules and of management strategy evaluation, Rec 15-07</p> <p>ICCAT (2016a) Recommendation 16-03 by ICCAT for the Conservation of North Atlantic Swordfish. https://www.iccat.int/Documents/Recs/compendiopdf-e/2016-03-e.pdf</p> <p>Neilson, J., Arocha, F., Calay, S., Mejuto, J., Ortiz, M., Scott, G., Smith, C., Travassos, P., Tserpes, G. & Andrushchenko, I. (2013). The Recovery of Atlantic Swordfish: The Comparative Roles of the Regional Fisheries Management Organization and Species Biology, Reviews in Fisheries Science, 21:2, 59-97.</p>		

PI 1.2.1	There is a robust and precautionary harvest strategy in place	
OVERALL PERFORMANCE INDICATOR SCORE: SI(a):80; SI(b):80; SI(c):60; SI(d):80; SI(e):n/r		85
CONDITION NUMBER (if relevant):		N/A

Evaluation Table for PI 1.2.2

PI 1.2.2		There are well defined and effective harvest control rules in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Y	Y	
	Justification	<p>The MSC Interpretation on Harvest Control Rules (HCRs) distributed to CABs on 16 December 2015, explains that “...‘generally understood’ HCRs do not need to be well defined or explicitly agreed, but there should be at least some implicit agreement supported by past management actions from which to understand that ‘generally understood’ rules exist, and there should be no reason to expect that management will not continue to follow such generally understood rules in future and act to be responsive to changes in indicators of stock status with respect to explicit or implicit reference points.”</p> <p>ICCAT has a history of taking management action to reduce the exploitation rate in the NA swordfish fishery in response to stock and fishing mortality status estimates. Fishing mortality rates were reduced by several ad hoc measures including transfer of effort to the South Atlantic by some countries, implementation of a minimum size and, later in the 1990s, the implementation of TACs which were renegotiated after every stock assessment.</p> <p>In 1999, ICCAT implemented a more formal, ten-year rebuilding plan under Recommendation (Rec) 99-02 (see PI1.1.2) and has set TACs, catch limits, and other technical regulations regularly since that time, following advice from the SCRS, to rebuild and maintain the North Atlantic swordfish stock above Bmsy.</p> <p>In 2011, ICCAT adopted Recommendation 11-13 setting out principles of decision making for ICCAT conservation and management measures (ICCAT 2011). This describes a generally understood decision-making framework based on a harmonized format for tuna RFMO science bodies to convey advice (Strategy Matrix) agreed at the Second Joint Meeting of Tuna RFMOs in June 2009 in San Sebastian, Spain. Recommendation 11-13 guides the Commission in developing management measures responsive to stock status as represented on the Kobe Plot (a standardized “four quadrant, red-yellow-green” format, which is widely embraced as a practical, user-friendly method to present stock status information). The Recommendation sets out clearly how management measures should be designed depending on where status is estimated in the Kobe quadrants, generally codifying the type of action taken in Recommendation 99-2. In all cases, the requirement set out is that management measures should be designed to maintain the stock at, or rebuild to, Bmsy, with a high probability. Where appropriate (overfishing and overfished) the adoption of a rebuilding plan is required.</p> <p>The framework does not specify actions with respect to approaching limits but is designed around achieving targets with high probability, considering both stock status and exploitation rate with requirements to reduce exploitation rate when it is above Fmsy. By definition, as the framework is designed to achieve the TRP with high probability and maintain fishing mortality below Fmsy, it will also act to maintain the stock above the implicit LRP (see PI1.1.2 si(b)). This represents, generally understood HCR that is consistent with the harvest strategy.</p> <p>Further, ICCAT recommendation 13-02 (ICCAT, 2013) on the conservation of North Atlantic swordfish, specifies at paragraph 5 that: <i>The SCRS and the Commission</i></p>		

		<p><i>shall begin a dialogue to allow for the development of harvest control rules (HCRs) for consideration in any subsequent recommendations. Further, while the HCRs are being developed, should the biomass approach the level which triggered the establishment of the previous rebuilding plan [Rec 99-02] then management measures should be considered to avoid further decline and begin to rebuild the stock.</i></p> <p>The SG60a requirements are therefore met.</p> <p>A new recommendation in 2016 (recommendation 16-03; ICCAT, 2016a) is more explicit. It specifies a “rebuilding plan”, determines when a “rebuilding plan” shall be triggered, and clearly states a requirement for harvest levels as recommended by the SCRS that will meet the Commission’s objectives of maintaining or rebuilding stocks to Bmsy within the defined (10 year) period. It also specifies that the Commission “shall adopt” those harvest levels. Specified actions are required if the biomass is estimated/projected to fall towards 0.65 Bmsy.</p> <p>The MRAG and Acoura teams note that:</p> <ol style="list-style-type: none"> 1. The SCRS undertakes regular reviews and provides regular advice; 2. The SCRS reviews don’t just look at current status, they project future status with measures of uncertainty. 3. The trigger is, in effect, above 0.65 Bmsy; Recommendation 16-03 states that “should the biomass approach the level which triggered the establishment of the previous rebuilding plan [Rec. 99-02], then the Commission shall adopt a 10-year rebuilding plan.”; 4. The minimum expectation is rebuilding within 10 years. 5. The words, “maintaining or rebuilding” imply a more precautionary approach and the possibility of triggering the plan well above 0.65 Bmsy. <p>We further note that the Rec 99-02 rebuilding plan pre-dated any certifications and has been invoked to suggest a general approach, supporting SG60 scoring. It was put in place when the Commission recognised the advice of the SCRS that the stock was over exploited, but not in response to a pre-planned rule guiding the Commission’s decision making. Rec 99-02 outlined (at Para 1) that a 10-year rebuilding program will be implemented to achieve Bmsy, and set up new catch limits for contracting parties. It also specified (at Para 9) that the SCRS should regularly conduct an assessment and provide advice. But it did not say how the Commission must react to that advice. The rebuilding of the swordfish stocks to above Bmsy demonstrates that the control implemented worked as desired and the requirement in advance to follow this action, should the biomass approach the level at which it was previously put in place, is now codified in Rec 16-03.</p> <p>The SG80a requirements are therefore met.</p> <p>NOTE: A process to develop a new HCR using Management Strategy Evaluation (MSE) is in effect. Recommendation 15-07 (ICCAT 2015) is on the development of a new HCR using MSE and includes specifications for the SCRS to advise the Commission on setting reference points for all stocks, including a 5-year schedule for the establishment of species-specific HCRs. At this stage, therefore, ICCAT planning for new HCR development, including LRP, TRP and other settings, is in-train. Once completed, it is possible that SG100 might be achieved at PI1.2.2(b). MSE is not a requirement to specify actions in a well-defined HCR and SG80 may in principle be achieved without it (at PI1.2.2(a) and/or (b)).</p>		
b	Guidepost		The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.
	Met?		Y	N

	Justification	<p>The SCRS assessments provide the Commission with estimates of projected biomass for a range of TAC options along with the associated probability of being at or above B_{MSY}. It has also advised the Commission on TACs that would achieve a specified probability of being at or above B_{MSY} (e.g. 75% in ICCAT, 2012). These probabilities are based upon the main uncertainties in the stock assessment, with consideration of alternative assessment approaches and multiple sensitivity tests (see PI 1.2.4). The HCR can therefore be considered to take account of the main uncertainties (due to data, assumptions and assessment model) in setting harvest levels.</p> <p>SG80 requirements are met.</p> <p>The HCR framework is an instruction to the Commission on how to proceed given status estimates and outlook advice from the SCRS. It naturally incorporates uncertainties due to the scientific processes but does not account for other uncertainties related, for example, to implementation error or issues not considered in the stock assessment processes, such as environmental or ecological processes.</p> <p>SG100 requirements are not met.</p>		
c	Guidepost	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
	Met?	Y	Y	N
	Justification	<p>ICCAT relies on its CPCs to constrain domestic harvesting within each country's or entity's catch limit. In addition, minimum size regulations have been established for the Convention area. Countries can implement domestic controls above and beyond these limits to further the conservation of North Atlantic swordfish. For example, US-specific tools include fleet quotas, individual quotas, time/area closures, observer coverage requirements, VMS requirements, dockside monitoring requirements, hail in/out requirements, logbook requirements, season, transfer processes and bycatch reduction measures.</p> <p>There is evidence that clearly shows these tools used to implement the generally understood harvest control rule is appropriate and effective in achieving the required exploitation levels (ICCAT, 2009b; 2012a). While there is evidence that the catch was reduced further than required by the TAC reductions implemented as part of the rebuilding plan, the successful rebuilding of the stock to B_{MSY} between 1999 and 2009 nevertheless shows that these tools are appropriate and effective in controlling exploitation. The consistent decline in fishing mortality from 1999 to recent years (since when it has been stable) is shown in the stock assessment outputs (for example, Figure 9 of ICCAT, 2016). The Commission is committed to implementing the TACs (ICCAT, 2011) and has put in place carry-over mechanisms to ensure this (see above).</p> <p>SG80 requirements are met.</p>		
References		<p>ICCAT (2009) Supplemental Recommendation by ICCAT to amend the Rebuilding Program for North Atlantic swordfish, Rec 09-02 http://www.iccat.int/Documents/Recs/compendiopdf-e/2009-02-e.pdf</p> <p>ICCAT (2011). Recommendation by ICCAT for Conservation of North Atlantic Swordfish, Rec. 11-02.</p> <p>ICCAT (2011a) Recommendation by ICCAT on the Principles of decision making for ICCAT Conservation and Management Measures, Rec 11-13. http://www.iccat.int/Documents/Recs/compendiopdf-e/2011-13-e.pdf</p>		

	<p>ICCAT (2012a) Report of the Standing Committee on Research and Statistics (SCRS), Madrid, Spain, October 2012. 303 pp. http://www.iccat.int/Documents/Meetings/SCRS2012/2012_SCRS_R</p> <p>ICCAT (2013) Report of the 2013 Atlantic Swordfish Stock Assessment Session. Doc. No. SCI-036/2013 https://www.iccat.int/Documents/Meetings/Docs/2013_SWO_ASSESS_REP_ENG.pdf</p> <p>ICCAT (2013b) Recommendation 13-02 for the Conservation of North Atlantic Swordfish https://www.iccat.int/Documents/Recs/compendiopdf-e/2013-02-e.pdf</p> <p>ICCAT (2015) Recommendation by ICCAT on the Development of Harvest Control Rules and of Management Strategy Evaluation, Rec 15-07 https://www.iccat.int/Documents/Recs/compendiopdf-e/2015-07-e.pdf</p> <p>ICCAT (2016) Report of the Standing Committee on Research and Statistics (SCRS) PLE 1 2016 http://www.iccat.org/Documents/Meetings/Docs/2016_SCRS_ENG.pdf</p> <p>ICCAT (2016a) Recommendation 16-03 by ICCAT for the Conservation of North Atlantic Swordfish. https://www.iccat.int/Documents/Recs/compendiopdf-e/2016-03-e.pdf</p>
OVERALL PERFORMANCE INDICATOR SCORE: SI(a): 80; SI(b): 80; SI(c): 80	80
CONDITION NUMBER (if relevant):	N/A

Evaluation Table for PI 1.2.3

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Y	Y	N
	Justification	<p>There is a good understanding of stock structure (ICCAT, 2007a). On-going tagging, genetic and morphological studies have generally confirmed stock structure, indicating that it is sufficient to support the harvest strategy.</p> <p>Several studies (ICCAT, 2006) have described Swordfish growth and have been used to characterize historical trends in the catch at length in the fishery, indicating that this information is also sufficient to support the harvest strategy.</p> <p>Information on growth is time invariant which does not allow for examination of production-associated temporal trends. The same appears to be the case with maturity changes. It is not therefore possible to say that information on stock productivity is comprehensive.</p> <p>Landings are generally dockside monitored and information on removals from all fleets exploiting the stock is considered adequate to inform the current harvest strategy (and future HCR development).</p> <p>SG60 and SG80 requirements are met.</p> <p>Overall, information on the fishery, while sufficient for the harvest strategy (and future HCR development), is not considered comprehensive (e.g. for growth and maturity trends).</p> <p>SG100 requirements are not met.</p>		
b	Guidepost	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Y	Y	N

<p>Justification</p>	<p>The composition and operations of fleets involved in the North Atlantic swordfish fishery are well understood. This species is available to a large number of fishing countries due to its broad geographical distribution in the Atlantic. Directed swordfish fisheries (longline and harpoon) across the whole Atlantic include fleets from Canada, EU-Spain, United States, Brazil, Morocco, Namibia, EU-Portugal, South Africa, Uruguay, and Venezuela. The primary by-catch or opportunistic fisheries that take swordfish are tuna fleets from Chinese Taipei, Japan, Korea and EU-France.</p> <p>ICCAT requires members to report information regarding fishing activities, including catches, catches by size, effort and CPUE and biological and distributional/migration data. Recommendation 13-02 states that all CPCs catching swordfish in the North Atlantic shall endeavor to provide annually the best available data to the SCRS, including catch, catch at size, location and month of capture on the smallest scale possible, as determined by the SCRS. The data submitted shall be for broadest range of age classes possible, consistent with minimum size restrictions, and by sex when possible. The data shall also include discards (both dead and alive) and effort statistics, even when no analytical stock assessment is scheduled. The SCRS shall review these data annually.</p> <p>Responsibility for reporting lies with the CPCs. Landings are recorded either through logbooks, dealer records or dockside monitoring. As most if not all swordfish are landed as individual fish, there is comprehensive information on the age/size composition of the landings. Reporting of catch data is reasonably up to date although there are some time lags. ICCAT (2013) reported catches up to 2012, noting that at the time of the assessment no 2012 catches were reported for eight CPCs. For these CPCs, the ICCAT swordfish stock assessment group used the average value of catches reported for 2009-2011 as an estimate for 2012 to use in the projections. This amounted to approximately a 6% increase in the reported catch of 13,134.</p> <p>Discards are estimated through observer coverage for those countries with this type of monitoring (e.g. US, Canada and Spain). Evaluations have been conducted which provide estimates of the uncertainty in these data and give guidance on the appropriate level of observer coverage. Observer coverage of the US pelagic longline fishery is consistent with NMFS guidelines (8%) and is sufficient to characterize discards. Observer coverage of the Spanish pelagic longline fishery is consistent with the recommendations of IEO scientists and the General secretariat for Fisheries (1%). Observer coverage of the Canadian longline fishery is consistent with the DFO recommended minimum coverage (5%). The SCRS reports in 2015 (ICCAT, 2015a) and 2016 (ICCAT, 2016) that several fleets have reported dead discards since 1991. The volume of Atlantic-wide reported discards has ranged from a minimum of 157 t in 2009 to a maximum of 1,139t in 2000, with 198t reported for 2014 and 149t in 2015. In 2015, the SCRS expressed concern due to the low percentage of fleets that have reported annual dead discards (in t) in recent years. Nevertheless, overall unreported landings and discards, do not appear to be significant. The uncertainties in these data are quantified through statistical models as part of the assessment process.</p> <p>Stock abundance is monitored through the SCRS assessment process (see PI 1.2.4). A number of indices of fishable biomass (from 1963) and abundance at age (from 1978) are available and are used in the stock assessment (e.g. ICCAT 2013) from a number of harvesting nations (Japan, Portugal, Morocco, Canada 1 and 2, Spain age-specific and age-aggregated, and USA 1 and 2) (ICCAT, 2013). These represent about 3 – 5 swordfish generations of monitoring. There are no fishery independent indices available so stock abundance indices are restricted to fishery dependent sources.</p> <p>The CPUE data and stock assessment support the setting of annual TACs and catch limits by ICCAT (see PI1.2.2 si(c)). Stock abundance and fishery removals are therefore regularly monitored at a level of accuracy and coverage consistent with the generally understood harvest control rule (see PI1.2.2 si(a)), and CPUE indices are available and monitored with sufficient frequency to support the harvest control rule. The SG60 and SG80 requirements are met.</p>
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		The last stock assessment was conducted in 2013 using data up to 2012. The next stock assessment is planned for 2017. Monitoring of abundance in the intervening period is based on CPUE indices. Stock estimates from the assessment are now several years old. Therefore, not all information required by the generally understood harvest control rule is monitored with high frequency and a high degree of certainty. The SG100 requirements are not met.		
c	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		Y	
	Justification	<p>All other fishery removals from the stock comprise only IUU fishing, if any.</p> <p>ICCAT has taken significant measures to eliminate IUU fishing as indicated by Rec 2003-16 and Rec 2011-18.</p> <p>Rec 2011-18 states that, "IUU fishing is one of ICCAT's most pressing problems, threatening the sustainability of the stocks and undermining ICCAT's credibility. It affects mostly Atlantic bluefin tuna (BFT) but also other ICCAT species, including bigeye, yellowfin, and skipjack tuna, and many shark species." The Recommendation does not mention North Atlantic swordfish in the list of species affected by IUU.</p> <p>Where IUU is considered a potential problem for stock assessment, the ICCAT SCRS incorporates stock assessment runs which include estimates of unreported catch. This has not been done for North Atlantic swordfish. As part of certification assessments, the Canadian DFO (pers. comm.) and US National Marine Fisheries Service (pers. comm.) have confirmed that the SCRS has no reason to believe there are any substantial unreported catches of North Atlantic swordfish, based on current information.</p> <p>Overall, all information on North Atlantic swordfish removals is considered good and able to support a robust stock assessment.</p> <p>The SG80 requirements are met.</p>		
References		<p>ICCAT (2003) Recommendation by ICCAT to Adopt Additional Measures Against Illegal, Unreported and Unregulated (IUU) Fishing https://www.iccat.int/Documents/Recs/compendiopdf-e/2003-16-e.pdf</p> <p>ICCAT (2006). ICCAT Manual. http://www.iccat.es/en/ICCATManual.asp?mId=4</p> <p>ICCAT (2007a). Report of the 2006 ICCAT workshop on swordfish stock structure. Col. Vol. Sci. Pap. ICCAT.61: 1 – 23. http://www.iccat.int/en/pubs_CVSP.htm</p> <p>ICCAT (2011) Recommendation by ICCAT Further Amending Recommendation 09-10 Establishing a List of Vessels Presumed to Have Carried Out Illegal, Unreported and Unregulated Fishing Activities in the ICCAT Convention Area https://www.iccat.int/Documents/Recs/compendiopdf-e/2011-18-e.pdf</p> <p>ICCAT (2013) Report of the 2013 Atlantic Swordfish Stock Assessment Session. Doc. No. SCI-036/2013 https://www.iccat.int/Documents/Meetings/Docs/2013_SWO_ASSESS_REP_ENG.pdf</p> <p>ICCAT (2015a) Report of the standing committee on research and statistics (SCRS). Spain, October 2015. https://www.iccat.int/Documents/Meetings/SCRS2015/SCRS_PROV_ENG.pdf</p> <p>ICCAT (2016) Report of the Standing Committee on Research and Statistics (SCRS) PLE 1 2016 http://www.iccat.org/Documents/Meetings/Docs/2016_SCRS_ENG.pdf</p>		

OVERALL PERFORMANCE INDICATOR SCORE: SI(a):80; SI(b):80; SI(c):80	80
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 1.2.4

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.
	Met?		Y	N
	Justification	<p>Stock production (that is, age-aggregated) and/or age-based models are commonly used in assessments to assess stock biomass and fishing mortality in relation to reference points associated with harvest control rules. Age-structured approaches, but not stock production ones, allow a description and consideration of year-class specific processes. For North Atlantic swordfish, it is not possible to reliably age 5+ fish and, for the age groups in the fishery (less than age 5), spatial and temporal dynamics, which may vary considerably by region in the North Atlantic, further complicate an age-structure approach. These make a stock production approach an appropriate option until these issues are resolved. The SCRS uses two production approaches to provide advice to the ICCAT Commission relative to B_{MSY}. The assessments are appropriate for the HCR in use (see PI 1.2.2).</p> <p>SG80 requirements are met.</p> <p>While the assessment models are appropriate for the stock and HCR and consider some of the major features of Swordfish biology and the fishery, the use of the stock production model to provide harvest advice implies the lack of explicit consideration of age-specific processes (e.g. recruitment) in management advice. While this is not completely true as the SCRS has also used age-structured assessment models as a check of the production model results, harvest projections are only made based on the latter. This is further complicated by the fact that full assessments are only conducted every 3 – 4 years. This implies that interim advice provided during updates cannot benefit from information that may be available in catch and CPUE data on incoming recruitment, or consider changes in selectivity due to changes in the nature of the fishery and technical regulations.</p> <p>SG100 requirements are not met.</p>		
b	Guidepost	The assessment estimates stock status relative to reference points.		
	Met?	Y		
	Justification	<p>Each assessment conducted by the SCRS for the last decade has provided estimates of current and historical biomass relative to B_{MSY} and current and historical fishing mortality rate relative to F_{MSY}. While there is no explicit limit reference point, the assessment calculates biomass relative to a number of reference points which might be adopted as limit reference points in the future.</p> <p>SG60 requirements are met.</p>		

PI 1.2.4		There is an adequate assessment of the stock status		
c	Guidepost	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Y	Y	Y
	Justification	<p>Major sources of uncertainty are identified in the assessment and include observation uncertainty in the combined biomass index and process uncertainty in the stock's intrinsic rate of growth, r, and carrying capacity, K. Alternate models of surplus production dynamics are also considered (SPM vs BSM). Model uncertainty is somewhat examined through comparing the results of age-structured (VPA) and age aggregated (SPM and BSM) formulations.</p> <p>Observation uncertainty is taken into account through use of a number of CPUE indices and their synthesis into a combined index through General Linear Modelling. Error in the catch and its associated proportions at age is assumed to be negligible. Process error is taken into account through consideration of alternate surplus production functions (e.g. Schaefer vs Fox) as well as uncertainty in the intrinsic rate of stock growth, r, and carrying capacity, K. It is less clear how model uncertainty is taken into account although the results of an age-structured statistically integrated model are compared to those of the age-aggregated models and narrative on this included in the assessment. In addition, retrospective analyses explore how the models perform when updated with new data.</p> <p>The SG60 and 80 requirements are met.</p> <p>The assessment, either using age-aggregated or age-structured approaches, takes uncertainty into account through examination of the implications of observation, process and model error. Retrospective analyses are undertaken to determine how the models perform when updated with new information. Key model parameters are described in probabilistic terms including the ratio of current biomass and fishing mortality to B_{MSY} and F_{MSY}, respectively.</p> <p>SG100 requirements are met.</p>		
d	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			Y
	Justification	<p>ICCAT (2013) explored the implications of alternative model formulations and a range of hypotheses under each model. For the two-stock production models there was a rigorous evaluation of each model while there was less time available to do the same for exploratory age structured model. Overall, noting the base case model used is a stock production model, ICCAT (2013) explored the implications of alternative model formulations and a range of hypotheses in a rigorous manner. Importantly, management advice based on the base case assessment model has been rigorously explored and estimates of trends in biomass and fishing mortality were similar across model formulations and a reasonable range of assumptions.</p> <p>The SG100 requirements are met.</p>		
e	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.

PI 1.2.4		There is an adequate assessment of the stock status		
	Met?		Y	N
	Justification	<p>The assessment of the stock status is subject to peer review. Internal peer reviews of stock assessments are conducted by the ICCAT SCRS which usually meets in October of every year. Additionally, working group meetings are held within a year on an ad-hoc as needed basis. Usually these are used to prepare data and analyses prior to an assessment meeting. Once an assessment has been reviewed by the full SCRS, an executive summary is presented to the Commission.</p> <p>The SG80 requirements are met.</p> <p>The SCRS is the scientific committee within ICCAT responsible for preparing and reviewing assessments. It is composed of scientists from the countries of ICCAT. While a broad range of international expertise participates in the SCRS this is considered an internal review. External review would require ICCAT to request individuals or a group outside of the SCRS to undertake a review of assessments. While ICCAT has a process for this which has been used for other stocks, it has not been applied to Swordfish.</p> <p>The SG100 requirements are not met.</p>		
References		<p>ICCAT (2013) Report of the 2013 Atlantic Swordfish Stock Assessment Session. Doc. No. SCI-036/2013 https://www.iccat.int/Documents/Meetings/Docs/2013_SWO_ASSESS_REP_ENG.pdf</p>		
OVERALL PERFORMANCE INDICATOR SCORE: SI(a):80; SI(b):60; SI(c):100; SI(d):100; SI(e):80				90
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 2.1.1

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	N – bigeye tuna and bluefin tuna (see Slc)	Y – Argentine squid and chub mackerel Y – All minor species meet SG80 by default	Y – shortfin mako shark
	Justification	<p>With respect to retained species, MSC guidance states “‘Main’ allows consideration of the weight, value or vulnerability of species caught. For instance, a retained species that comprises less than 5% of the total catch by weight may normally be considered to be a minor retained species (i.e., not ‘main’) in the catch, unless it is of high value to the fisher or of particular vulnerability.” (GCB3.5.2, MSC 2013b).</p> <p>In this regard, bigeye tuna (<i>Thunnus obesus</i>) and bluefin tuna (<i>Thunnus thynnus</i>) comprise less than 5% of the catch, but are assessed as main retained species on the basis of vulnerability, while shortfin mako shark (<i>Isurus oxyrinchus</i>), yellowfin tuna (<i>Thunnus albacares</i>) and albacore tuna (<i>Thunnus alalunga</i>) are considered to be minor retained species.</p> <p>The also MSC requires that bait species are considered against the retained species performance indicators (CB3.5.5, MSC 2013a). On this basis, Argentine squid (<i>Illex argentes</i>) and chub mackerel (<i>Scomber japonicas</i>) both qualify as main retained species by comprising more than 5% of the ‘catch’, while Atlantic mackerel (<i>Scomber scombus</i>) from Spain qualifies as a minor retained species.</p> <p><u>Bigeye tuna – Main Retained (4.7%)</u></p> <p>Atlantic bigeye tuna was last assessed in 2015, and at that time the stock was estimated to be overfished and overfishing was occurring (ICCAT 2015d). As such, bigeye tuna is scored under Slc (see below).</p> <p><u>Bluefin tuna – Main Retained (2.7%)</u></p> <p>The Western Atlantic bluefin tuna stock was last assessed in 2014, and while fishing mortality at that time was less than F_{MSY} in all scenarios, such that overfishing was not occurring, biomass under some scenarios was less than B_{MSY} (ICCAT 2014a). As such, bluefin tuna is scored under Slc (see below).</p> <p><u>Argentine squid – Main Retained (7.6%)</u></p> <p>Argentine squid is a short-lived species with a population size which is strongly influenced by environmental drivers. The average age at maturity is less than one year (Safina Centre 2014). It is also highly fecund, and catches averaged in excess of 480,000 t for the 2011-2014 period (FAO 2016a). SG80 is met, but in the absence of a clear status indicator, SG100 is not.</p> <p><u>Chub mackerel – Main Retained (5.7%)</u></p> <p>Chub mackerel is an abundant, Indo-Pacific, primarily coastal pelagic species. The average annual total catch for the 2011-2014 period is estimated at 1,695,500 t (FAO 2016), while approximately 300 t is used annually in the swordfish longline fishery. There are various stocks of this species have fluctuated considerably over time, but the main driver of stock size is the environment (Collette et al. 2011). SG80 is met, but in the absence of a clear status indicator, SG100 is not.</p>		

PI 2.1.1	The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species			
		<p><u>Shortfin mako shark – Minor Retained (2.5%)</u></p> <p>The latest assessment of shortfin mako shark (ICCAT 2012a) utilised 16 runs of a Bayesian surplus production model, which gave very consistent results. All the runs found that the median of the current stock abundance was above B_{MSY}. All runs also found that the median F was less than F_{MSY}, except for the run that used estimated catches from effort before 1997. A catch-free-age-structured production model was also applied to the North Atlantic stock of shortfin mako. Estimates of SSB/SSB_{MSY} across all scenarios explored ranged from 1.63 to 2.04 and estimates of F/F_{MSY} ranged from 0.16 to 0.62. ICCAT (2012a) concluded that the results indicated in general that the status of the North Atlantic shortfin mako shark stock is healthy and the probability of overfishing is low. As such, shortfin mako shark meets SG100.</p> <p><u>Yellowfin tuna – Minor Retained (1.6%)</u></p> <p>The most recent full stock assessment of Atlantic yellowfin tuna was conducted in 2011 (ICCAT 2016c). At that time, overfishing was not likely to be occurring, but there was only an estimated 26% chance that the stock was not overfished. Continuation of catch levels in the order of 110,000 t was expected to lead to a biomass above B_{MSY} by 2016 with a 60% probability. These projections have not been updated, however the overall catches in 2012-2014 were lower than 110,000 t, which could result in a higher probability of achieving B_{MSY} within the same time frame. As such, while this element achieves SG80 as a minor species, it does not meet the requirements of SG100.</p> <p><u>Albacore tuna – Minor Retained (0.8%)</u></p> <p>The northern Atlantic stock of albacore tuna was most recently assessed in 2013 (ICCAT 2016d). That assessment indicated that the stock has remained overfished with SSB below SSB_{MSY} since the mid-1980s, but status has improved since the lowest levels around 30% in the late 1990s, and current SSB_{2011} is approximately 94% of SSB at MSY. The F_{2011}/F_{MSY} ratio is now 0.72, indicating that overfishing is not occurring. As a minor species, albacore tuna meets SG80 but does not meet the SG100 requirement.</p> <p><u>Atlantic mackerel – Minor Retained (4%)</u></p> <p>Atlantic mackerel (<i>Scomber scombrus</i>) is a coastal and shelf scombrid species of the North Atlantic and Mediterranean. The average annual total catch for the 2011-2014 period is estimated at 1,064,000 t (FAO 2016c), while approximately 156 t is used annually swordfish longline fishery. The stock is assessed by ICES, and biomass has exceeded $MSYB_{trigger}$ (a reference point indicating the stock is not considered to be at risk of being below safe biological limits) since 2009 (ICES 2016a). SG100 is met.</p>		
b	Guidepost			Target reference points are defined for retained species.
	Met?			<p>Y – bigeye tuna, bluefin tuna, shortfin mako, yellowfin tuna, albacore tuna, Atlantic mackerel</p> <p>N – chub mackerel and Argentine squid.</p>

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
	Justification	<p>Target reference points are defined for bigeye tuna (ICCAT 2015d), bluefin tuna (ICCAT 2014a), shortfin mako (ICCAT 2012a), yellowfin tuna (ICCAT 2016c), albacore tuna (ICCAT 2016d) and northeast Atlantic mackerel (ICES 2016a).</p> <p>Reference points for chub mackerel (e.g. Fishsource 2016) and Argentine squid (e.g., Safina Centre 2014) were not identified during this reassessment.</p>		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y – bigeye tuna and bluefin tuna N/A – All other species	Y – bigeye tuna and bluefin tuna N/A – All other species	
	Justification	<p>This SI is scored for bigeye tuna and bluefin tuna, only.</p> <p><u>Bigeye tuna</u></p> <p>Management of the Atlantic bigeye tuna fishery is coordinated through ICCAT, with a multi-year conservation and management program in place (ICCAT 2016e). Under the program, Canada's bigeye tuna catch is required to be maintained at less than 1,575 t. There is no significant Canadian catch of Atlantic bigeye tuna other than in the swordfish longline fishery, and the annual landings of bigeye tuna in this fishery have averaged just 176 t over the 2011-2015 period (Table 4). This quantity accounts for just 0.2% of the TAC for this species, and only around 11% of the Canadian allocation. SG80 is met.</p> <p><u>Bluefin tuna</u></p> <p>As with bigeye tuna, management of the Atlantic bluefin tuna is coordinated through ICCAT, with a multi-year rebuilding program being in place (ICCAT 2016e). Under this program, Canada's quota for bluefin tuna for 2015 and 2016 was capped at 437.47 t. Landings in the swordfish longline fishery have averaged 46.8 t over the 2011-2015 period (Table 4), however, which accounted for just 2.7% of the total TAC for this species, and only around 11% of the Canadian allocation. SG80 is met.</p>		
d	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	Met?	Y – Argentine squid, chub mackerel N/A – All other species		

PI 2.1.1	The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species
Justification	<p>Both Argentine squid and chub mackerel are considered as retained species on the basis of being used as bait in the swordfish longline fishery. They are considered here because the exact source of these species is not known. The total catches of both these species is measured in the hundreds of thousands of tonnes, however, and their populations are considered to fluctuate mainly as a result of environmental drivers rather than because of fishing pressure (e.g., Collette et al. 2011, Safina Centre 2014). The quantities of these species used as bait in the swordfish longline fishery represent extremely small, essentially negligible quantities in comparison to the total catch, and are never likely to increase significantly beyond these amounts. This SG60 requirement is met.</p>
References	<p>Collette, B., Acero, A., Canales Ramirez, C., Cardenas, G., Carpenter, K.E., Chang, S.-K., Di Natale, A., Fox, W., Guzman-Mora, A., Juan Jorda, M., Miyabe, N., Montano Cruz, R., Nelson, R., Salas, E., Schaefer, K., Serra, R., Sun, C., Uozumi, Y., Wang, S., Wu, J. & S. Yeh (2011). <i>Scomber japonicus</i>. The IUCN Red List of Threatened Species 2011</p> <p>FAO (2016a). Species fact sheet – <i>Illex argentines</i>. Food and Agriculture Organization of the United Nations. 3 pp. http://www.fao.org/fishery/species/3565/en</p> <p>FAO (2016b). Species fact sheet – <i>Scomber japonicus</i>. Food and Agriculture Organization of the United Nations. 3 pp. http://www.fao.org/fishery/species/3277/en</p> <p>FAO (2016c). Species fact sheet – <i>Scomber scombrus</i>. Food and Agriculture Organization of the United Nations. 3 pp. http://www.fao.org/fishery/species/2473/en</p> <p>Fishsource (2016). Species profile – Pacific chub mackerel. Available online: https://www.fishsource.org/fishery_page/3759</p> <p>ICCAT (2012a). 2012 Shortfin mako stock assessment and ecological risk assessment meeting. Olhão, Portugal, June 11-18, 2012. International Commission for the Conservation of Atlantic Tunas, Madrid, 105 pp. Available online: https://www.iccat.int/Documents/Meetings/Docs/2012_SHK_ASS_ENG.pdf</p> <p>ICCAT (2014a). Executive summary, Report of the 2014 Atlantic bluefin tuna stock assessment session, Madrid, Spain, September 22-27, 2014. International Commission for the Conservation of Atlantic Tunas, Madrid, 35 pp. Available online: https://www.iccat.int/Documents/SCRS/ExecSum/BFT_ENG.pdf</p> <p>ICCAT (2015d). Executive summary, Report of the 2015 ICCAT bigeye tuna stock assessment session, Madrid, Spain, July 13-17, 2015. International Commission for the Conservation of Atlantic Tunas, Madrid, 19 pp. Available online: https://www.iccat.int/Documents/SCRS/ExecSum/BET_ENG.pdf</p> <p>ICCAT (2016c). Executive summary, Report of the 2016 ICCAT yellowfin tuna stock assessment meeting, San Sebastian, Spain, July 27 – July 1, 2016. International Commission for the Conservation of Atlantic Tunas, Madrid, 17 pp. Available online: https://www.iccat.int/Documents/SCRS/ExecSum/YFT_ENG.pdf</p> <p>ICCAT (2016d). Executive summary, Report of the 2016 ICCAT North and South Atlantic albacore stock assessment meeting, Madeira, Portugal, April 28 – May 6, 2016. International Commission for the Conservation of Atlantic Tunas, Madrid, 24 pp. Available online: https://www.iccat.int/Documents/SCRS/ExecSum/ALB_ENG.pdf</p> <p>ICCAT (2016e). Compendium – Management recommendations and resolutions adopted by ICCAT for the conservation of Atlantic tunas and tuna-like species. International Commission for the Conservation of Atlantic Tunas, Madrid, 334 pp. Available online: https://www.iccat.int/Documents/Recs/ACT_COMP_2016_ENG.pdf</p> <p>ICES (2016a). Mackerel (<i>Scomber scombrus</i>) in subareas 1–7 and 14, and in divisions 8.a–e and 9.a (Northeast Atlantic). 14 pp. Available online:</p>

PI 2.1.1	<p>The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species</p>	
	<p>http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/mac-nea.pdf</p> <p>MSC 2013a. MSC Certification Requirements, Version 1.3, 14 January 2013. Marine Stewardship Council, London, 301 pp.</p> <p>MSC 2013b. Guidance to the MSC Certification Requirements, Version 1.3. 14 January 2013. Marine Stewardship Council, London,” 254 pp.</p> <p>Safina Centre (2014). Species profile – Argentine squid. 16 pp. Available online: http://safinacenter.org/documents/2014/08/argentine-squid-full-species-report.pdf</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		90
CONDITION NUMBER (if relevant):		N/A

PI 2.1.1 Scoring calculation

Species	Main / Minor	Sl _a (60, 80, 100)	Sl _b (100 only)	Sl _c (60, 80 only)	Sl _d (60 only)	Element score	PI Score
Bigeye tuna	Main	Sl _c scored	100	80	N/A	90	90
Bluefin tuna	Main	Sl _c scored	100	80	N/A	90	
Shortfin mako shark	Minor	100	100	N/A	N/A	100	
Yellowfin tuna	Minor	80	100	N/A	N/A	90	
Albacore tuna	Minor	80	100	N/A	N/A	90	
Argentine squid	Main	80	Default 80	N/A	60	80	
Chub mackerel	Main	80	Default 80	N/A	60	80	
Atlantic mackerel	Minor	100	100	N/A	N/A	100	

Evaluation Table for PI 2.1.2

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
	Met?	Y – all retained species	Y – all retained species	Y – Bluefin tuna N – all other retained species
	Justification	<p>Bigeye tuna and bluefin tuna comprise less than 5% of the catch, but are assessed as main retained species on the basis of vulnerability, while shortfin mako shark, yellowfin tuna and albacore tuna are considered to be minor retained species.</p> <p>For bait species, Argentine squid and chub mackerel both qualify as main retained species through comprising more than 5% of the 'catch', while Atlantic mackerel from Spain qualifies as a minor retained species.</p> <p>There are various management measures in place in the swordfish longline fishery for retained species (not including bait species). These include, a limited number of licences, a hail out prior to fishing, vessels are practically limited in the number of hooks that can be deployed, all hooks must be corrodible circle hooks, vessels are required to operate a VMS and are subject to observer coverage (covering an average of 6.8% of the swordfish catch from 2011-2015 – Table 6) there is aerial overflight and at-sea enforcement activity, and there is a requirement for a hail-in prior to landing, and 100% dockside monitoring is in place (DFO 2016h). All retained species are also subject to stock assessment and monitoring, with Canadian catch data submitted to ICCAT for these purposes. Together, these measures comprise a partial strategy, and SG80 is met. The measures don't meet the MSC definition of a full 'strategy', however, (e.g., it is not clear that there are mechanisms in place for the modification of fishing practices if unacceptable impacts were identified – GCB3.3, MSC 2013b), so SG100 is not met.</p> <p>For bluefin tuna, there are additional measures in place which do meet the SG100 level of performance. These include additional licensing restrictions that limit who can fish for bluefin tuna, and when and how fishing can take place. There is also a requirement to tag landed bluefin tuna, and the existence of specific closed areas to limit impacts on this species. A multi-year rebuilding program is in place for bluefin tuna, with individual, country-based quotas in place, including for Canada (ICCAT 2016e).</p> <p>For bait species, the partial strategy in place is simply that the quantities used are extremely small relative to the catch of the species in question, and purchasing is based on supply and availability rather than because a specific squid or mackerel species is critical to the fishery. As such, bait species are considered to meet SG80, but not SG100 as there is not considered to be a 'strategy' in place.</p>		

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y – all retained species	Y – all retained species	Y – Bluefin tuna N – all other retained species
	Justification	<p>The approach taken to the management of retained species (not including bait) is consistent with that taken in other fisheries, and contains the essential elements of effort and area limits, monitoring and assessment. Catches for retained species in the swordfish longline fishery are low relative to the total catch of each species. There is objective basis for confidence that the partial strategy will work for retained species, and SG80 is met. Species for which there is not considered to be a strategy in place cannot meet SG100.</p> <p>For bluefin tuna, there is additional management in place, and the overall multi-year rebuilding program for this species (ICCAT 2016e). The latest assessment results indicate that the stock has been growing, and that F is less than F_{MSY} in both high and low recruitment scenarios (ICCAT 2014a); SG100 is met for bluefin tuna.</p> <p>As noted in Sla, for bait species, the partial strategy in place is simply that the quantities used are extremely small relative to the catch of the species in question, and purchasing is based on supply and availability rather than because a specific squid or mackerel species is critical to the fishery. As such, these species are considered to meet SG80, but not SG100 as there is not a 'strategy' in place.</p>		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y – all retained species	Y – Bluefin tuna N – all other retained species
	Justification	<p>Evidence that the partial strategy (licences, areas fished, hook types, data collection, etc) is being implemented successfully is available in the form of the compliance information. As noted elsewhere, at no time throughout the certified period has there been evidence of significant compliance issues or systematic non-compliance. Nevertheless, retained species other than bluefin tuna cannot meet this SG100 level requirement as there is not considered to be a 'strategy' in place under Sla.</p> <p>Given the size, value and prominence of bluefin tuna, the management focus is particularly intense. It is considered that C&P data in Canada, and the stock assessment results more widely, together provide clear evidence that the strategy is being implemented successfully – SG100 is met.</p> <p>As noted in Sla, for bait species, the partial strategy in place is simply that the quantities used are extremely small relative to the catch of the species in question, and purchasing is based on supply and availability rather than because a specific squid or mackerel species is critical to the fishery. As such, these species are considered to meet SG80, but not SG100 as there is not a 'strategy' in place.</p>		

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			Y – Bluefin tuna N – all other retained species
	Justification	Retained species other than bluefin tuna cannot meet this SG100 level requirement as there is not considered to be a 'strategy' in place under Sla. For bluefin tuna, Canadian catch is closely controlled and data are submitted to ICCAT. The latest stock assessment results indicate that F is less than F_{MSY} , and that the stock is growing. SG100 is met.		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Y – shortfin mako	Y – shortfin mako	Y – shortfin mako
	Justification	Shortfin mako is the only shark assessed as a 'retained species'. Relatively small quantities are taken (average 43 t landed annually between 2011-2015), and while fins may be removed from the shark carcasses (i.e., a shark body without the fins) for storage and handling purposes, a variety of measures are in place as licence conditions that ensure finning does not occur; these include that shark carcasses cannot be discarded, the number of fins retained cannot exceed the number that would normally be attached to the carcasses landed, and the weight of fins cannot exceed 5% of the weight of the corresponding carcasses (DFO 2016h). Importantly, there is also 100% dockside monitoring of all landings, with a hail-in required prior to landing. The Assessment Team is not aware of any infractions having been reported in the fishery for reasons associated with shark finning. SG100 is met.		
References		<p>DFO (2016h). 2016 Canadian Atlantic swordfish longline conditions. Department of Fisheries and Oceans Canada. 9 pp.</p> <p>ICCAT (2014a). Executive summary, Report of the 2014 Atlantic bluefin tuna stock assessment session, Madrid, Spain, September 22-27, 2014. International Commission for the Conservation of Atlantic Tunas, Madrid, 35 pp. Available online: https://www.iccat.int/Documents/SCRS/ExecSum/BFT_ENG.pdf</p> <p>ICCAT (2016e). Compendium – Management recommendations and resolutions adopted by ICCAT for the conservation of Atlantic tunas and tuna-like species. International Commission for the Conservation of Atlantic Tunas, Madrid, 334 pp. Available online: https://www.iccat.int/Documents/Recs/ACT_COMP_2016_ENG.pdf.</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				N/A

PI 2.1.2 Scoring calculation

Species	Main / Minor	Sl _a (60, 80, 100)	Sl _b (60, 80, 100)	Sl _c (80, 100 only)	Sl _d (100 only)	Sl _e (60, 80, 100)	Element score	PI Score
Bigeye tuna	Main	80	80	80	Default 80	N/A	80	85
Bluefin tuna	Main	100	100	100	100	N/A	100	
Shortfin mako shark	Minor	80	80	80	Default 80	100	85	
Yellowfin tuna	Minor	80	80	80	Default 80	N/A	80	
Albacore tuna	Minor	80	80	80	Default 80	N/A	80	
Argentine squid	Main	80	80	80	Default 80	N/A	80	
Chub mackerel	Main	80	80	80	Default 80	N/A	80	
Atlantic mackerel	Minor	80	80	80	Default 80	N/A	80	

Evaluation Table for PI 2.1.3

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y – all retained species	Y – all retained species	Y – all retained species
	Justification	Landings data for retained species are recorded in logbooks and verified routinely with 100% dockside monitoring. Observers are also deployed routinely, with a target of 5% coverage for the period 2011-2015, although the target coverage has been increased to 10% for 2017 following a risk review (DFO, pers. comm.). It is considered that accurate and verifiable information is available on the catch of all retained species. Also, species taken in the fishery are subject to stock assessment (e.g., ICCAT 2015, ICCAT 2014a, ICCAT 2016c, etc.), while the quantities used as bait are extremely small relative to the total catch of those species. As such, it is considered that the consequences for the status of affected populations are also known; SG100 is met.		
b	Guidepost	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y – all retained species	Y – all retained species	N – all retained species
	Justification	<p>Catches in the swordfish longline fishery are recorded on logbooks, and observer coverage (in terms of the proportion of the swordfish retained) has averaged more than 6% for the 2011-2015 period (Table 6). Landings are verified through 100% dockside monitoring.</p> <p>DFO has recently increased the target observer coverage to 10%, following a review indicating that there was some uncertainty over the level of discarding from the fishery (DFO, pers. comm.). As such, it is not clear that information is sufficient to quantitatively estimate outcome status with a high degree of certainty, so SG100 is not met.</p> <p>For bait species, although the quantities used are extremely small relative to the total catch, because the amount used is only an estimate, and the quantities or sources can change quickly depending on price and availability, SG80 is considered met, but not SG100.</p>		
c	Guidepost	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
	Met?	Y – all retained species	Y – all retained species	Y – all retained species
	Justification	<p>The reporting requirements, observer coverage and 100% dockside monitoring in the swordfish longline fishery are certainly adequate to support a partial strategy to manage retained species, and so SG80 is met. The recent query over discarding levels (DFO pers. comm.) is being addressed through an increase in observer coverage levels, and so it is considered that information is also adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective; SG100 is met.</p> <p>The management of fisheries for bait species is completely independent of the management of the swordfish longline fishery, but the quantities used are extremely small relative to the total catch. The information available on the quantities used and the catches from and status of the stocks as a whole (e.g., Fishsource 2016, ICES 2016a, Safina Centre 2014) is therefore adequate to evaluate with a high degree of certainty whether the strategy is achieving its objective; SG100 is met for these species, also.</p>		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Y – all retained species	N – all retained species
	Justification	<p>Licences in the swordfish longline fishery are capped, the entire fleet is required to operate with VMS, and vessels must hail-out prior to fishing and hail-in prior to landing. Catches are recorded on logbooks, and there is 100% dockside monitoring. It is considered that this information clearly means the fishery meets the SG80 requirement that sufficient data continue to be collected to detect any increase in risk level.</p> <p>Post-release mortality levels for shortfin mako shark have been estimated, recently (Campana <i>et al.</i> 2016). However, to the knowledge of the assessment team, post-release mortality levels for other retained fish species that are discarded are unknown, and while the increase in observer coverage to address a query over discarding (DFO pers. comm.) is evidence that managers are responding to an identified uncertainty, it is not yet clear if the monitoring is conducted in sufficient detail to assess ongoing mortalities to all retained species. As such, SG100 is not met.</p> <p>For bait species, again, although the quantities used are extremely small relative to the total catch, because the amount used is only an estimate, and the quantities or sources can change quickly depending on price and availability, SG80 is considered met, but not SG100.</p>		
References		<p>Campana, S.E., Joyce, W., Fowler, M. & M. Showell (2016). Discards, hooking, and post-release mortality of porbeagle (<i>Lamna nasus</i>), shortfin mako (<i>Isurus oxyrinchus</i>), and blue shark (<i>Prionace glauca</i>) in the Canadian pelagic longline fishery. ICES Journal of Marine Science, V. 73, pp. 520-528.</p> <p>Fishsource (2016). Species profile – Pacific chub mackerel. Available online: https://www.fishsource.org/fishery_page/3759.</p>		

PI 2.1.3	Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species	
	<p>ICCAT (2014a). Executive summary, Report of the 2014 Atlantic bluefin tuna stock assessment session, Madrid, Spain, September 22-27, 2014. International Commission for the Conservation of Atlantic Tunas, Madrid, 35 pp. Available online: https://www.iccat.int/Documents/SCRS/ExecSum/BFT_ENG.pdf</p> <p>ICCAT (2015d). Executive summary, Report of the 2015 ICCAT bigeye tuna stock assessment session, Madrid, Spain, July 13-17, 2015. International Commission for the Conservation of Atlantic Tunas, Madrid, 19 pp. Available online: https://www.iccat.int/Documents/SCRS/ExecSum/BET_ENG.pdf</p> <p>ICCAT (2016c). Executive summary, Report of the 2016 ICCAT yellowfin tuna stock assessment meeting, San Sebastian, Spain, July 27 – July 1, 2016. International Commission for the Conservation of Atlantic Tunas, Madrid, 17 pp. Available online: https://www.iccat.int/Documents/SCRS/ExecSum/YFT_ENG.pdf</p> <p>ICES (2016a). Mackerel (<i>Scomber scombrus</i>) in subareas 1–7 and 14, and in divisions 8.a–e and 9.a (Northeast Atlantic). 14 pp. Available online: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/mac-nea.pdf.</p> <p>Safina Centre (2014). Species profile – Argentine squid. 16 pp. Available online: http://safinacenter.org/documents/2014/08/argentine-squid-full-species-report.pdf</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		90
CONDITION NUMBER (if relevant):		N/A

PI 2.1.3 Scoring calculation

Species	Main / Minor	Sl _a (60, 80, 100)	Sl _b (60, 80, 100)	Sl _c (60, 80, 100)	Sl _d (80, 100 only)	Element score	PI Score
Bigeye tuna	Main	100	80	100	80	90	90
Bluefin tuna	Main	100	80	100	80	90	
Shortfin mako shark	Minor	100	80	100	80	90	
Yellowfin tuna	Minor	100	80	100	80	90	
Albacore tuna	Minor	100	80	100	80	90	
Argentine squid	Main	100	80	100	80	90	
Chub mackerel	Main	100	80	100	80	90	
Atlantic mackerel	Minor	100	80	100	80	90	

Evaluation Table for PI 2.2.1

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y – all bycatch species	Y – all bycatch species	N – all bycatch species
	Justification	<p>Blue shark is assessed as a main bycatch species, while porbeagle shark (<i>Lamna nasus</i>), common thresher shark (<i>Alpas vulpinus</i>) and white marlin (<i>Kajikia albida</i>) are assessed as minor bycatch species.</p> <p><u>Blue shark – Main bycatch (44.8%)</u></p> <p>The most recent assessment of the North Atlantic blue shark stock was undertaken in 2015 (ICCAT 2015e). All scenarios considered indicated that the stock was not overfished ($B_{2013}/B_{MSY} = 1.35-3.45$) and that overfishing was not occurring ($F_{2013}/F_{MSY} = 0.04-0.75$); a similar status was also concluded in the 2008 stock assessment. However, the stock assessment report noted that there was a high level of uncertainty in data inputs and model structural assumptions, so the possibility of the stock being overfished and overfishing occurring could not be ruled out. SG80 is met, but not SG100 for this species.</p> <p><u>Porbeagle shark – Minor bycatch (0.7%)</u></p> <p>The latest stock assessment information for porbeagle was presented by Campana et al. (2015). The authors ran four variants of a forward projecting, age and sex-structured life history model, fit to catch-at-length and catch per unit effort data to the end of 2008, although some information including catch and discards was updated to the end of 2011. The four variants of the population model differed in their assumed productivity, but all variants of the model predicted porbeagle recovery to 20% of spawning stock numbers (SSN20%) before 2014 if the human-induced mortality rate was kept at or below 4% of the vulnerable biomass (Campana et al. 2015). Accounting for landings, capture mortality and post-release mortality, the total annual mortality of porbeagle from all commercial fishing activities in Canadian waters from 2009 to 2014 has averaged 107 t (range 88 – 164 t); this represents a mortality rate of approximately 2% (DFO 2015). Following Campana et al. (2015), these catch and mortality data indicate that the porbeagle population status is now highly likely to be above the SSN20% level, such that SG80 is met. SG100 is not met because this status cannot be confirmed in the absence of an updated assessment for porbeagle.</p> <p><u>Common thresher shark – Minor bycatch (0.3%)</u></p> <p>There is no formal stock assessment for Atlantic common thresher shark, but Young et al. (2015) determined that while common thresher shark in the Northwest and Central Atlantic had undergone a decline historically, the population has likely stabilised since 1990.</p> <p>Information on total catches of thresher shark in all fisheries is available, indicating that the swordfish longline fishery accounts for approximately 7% of the total for the 2011-2015 period. Although all the thresher shark taken in the swordfish longline fishery are discarded, the Assessment Team did not find any specific information on post-release survival rates from commercial longline fisheries. As a minor bycatch species, a default score of 80 is attained for this SI, but SG100 is not met.</p> <p><u>White marlin – Minor bycatch (0.2%)</u></p>		

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
		There is considerable uncertainty in the results of the 2012 white marlin stock assessment, but they indicated that whilst the stock remains overfished, relative fishing mortality has been declining over the last ten years and is now most likely to be below F_{MSY} , such that overfishing is not occurring. Although relative biomass has probably stopped declining over the last ten years, it still remains well below B_{MSY} . As a minor bycatch species, a default score of 80 is attained for this SI, but SG100 is not met.		
b	Guidepost	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	N/A	N/A	
	Justification	Not applicable – blue shark is the only main bycatch species, and this species is not outside biological limits.		
c	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	N/A		
	Justification	At the SG60 level, this requirement is assessed for main species only. Blue shark is the only main bycatch species, and its status is not poorly known.		
References		<p>Campana, S.E., Fowler, M., Houlihan, D., Joyce, W., Showell, M., Miri, C. & M. Simpson (2015). Current status and threats to the North Atlantic blue shark (<i>Prionace glauca</i>) population in Atlantic Canada. DFO Canadian Science Advisory Secretariat Research Document 2015/026. v + 44 pp</p> <p>Science Advisory Secretariat Research Document 2012/096. iv + 84 pp.</p> <p>DFO (2015). Recovery potential assessment for porbeagle (<i>Lamna nasus</i>) in Atlantic Canada. DFO Canadian Science Advisory Secretariat Science Advisory Report 2015/048. 18 pp.</p> <p>ICCAT (2012b). Executive summary, Report of the 2012 white marlin stock assessment meeting, Madrid, Spain, May 21-25, 2012. International Commission</p>		

PI 2.2.1	<p>The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups</p>	
	<p>for the Conservation of Atlantic Tunas, Madrid, 11 pp. Available online: https://www.iccat.int/Documents/SCRS/ExecSum/WHM_ENG.pdf</p> <p>ICCAT(2015e). Report of the 2015 ICCAT blue shark stock assessment session, Lisbon, Portugal, July 27-31, 2015. International Commission for the Conservation of Atlantic Tunas, Madrid, 116 pp. Available online: https://www.iccat.int/Documents/Meetings/Docs/2015_BSH%20ASSESS_REPORT_ENG.pdf.</p> <p>IMM (2012). North Atlantic Swordfish (<i>Xiphias gladius</i>) Canadian Pelagic Longline Fishery, Volume 1, public certification report. Intertek Moody Marine, Dartmouth, Canada. 244 pp.</p> <p>Knapman, P., Stokes, K. & R. Blyth-Skyrme (2017). On-site surveillance visit – report for the North West Atlantic Canada longline swordfish fishery. Acoura Marine, Scotland, 118 pp.</p> <p>MSC 2013a. MSC Certification Requirements, Version 1.3, 14 January 2013. Marine Stewardship Council, London, 301 pp.</p> <p>MSC 2013b. Guidance to the MSC Certification Requirements, Version 1.3. 14 January 2013. Marine Stewardship Council, London,” 254 pp.</p> <p>Young, C.N., Carlson, J., Hutchinson, M., Kobayashi, D., McCandless, C., Miller, M.H., Teo, S., & T. Warren (2015). Status review report: common thresher shark (<i>Alopias vulpinus</i>) and bigeye thresher shark (<i>Alopias superciliosus</i>). Final Report to National Marine Fisheries Service, Office of Protected Resources. December 2015. 196 pp. Available online: http://www.cio.noaa.gov/services_programs/prplans/pdfs/ID344_Thresher_Shark_Final_Product.pdf</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		N/A

PI 2.2.1 Scoring calculation

Species	Main / Minor	Sl _a (60, 80, 100)	Sl _b (60, 80 only)	Sl _c (60 only)	Element score	PI Score
Blue shark	Main	80	N/A	N/A	80	80
Porbeagle shark	Minor	80	N/A	N/A	80	
Thresher shark	Minor	Default 80	N/A	N/A	80	
White marlin	Minor	Default 80	N/A	N/A	80	

Evaluation Table for PI 2.2.2

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y – all bycatch species	Y – all bycatch species	Y – porbeagle shark N – all other bycatch species
	Justification	<p>Blue shark comprises 44.8% of the catch in the swordfish longline fishery and is assessed as main bycatch species, while porbeagle shark (0.7% of the catch), common thresher shark (0.3% of the catch) and white marlin (0.2% of the catch) are considered to be minor bycatch species.</p> <p>There are various management measures in place in the swordfish longline fishery for bycatch species. These include, limited licences, a hail-out is required prior to fishing, vessels are practically limited in the number of hooks that can be deployed, all hooks must be corrodible circle hooks, wire leaders cannot be used, vessels are required to operate a VMS and are subject to observer coverage (covering an average of 6.8% of the swordfish catch from 2011-2015 – Table 6) there is aerial overflight and at-sea enforcement activity, and there is a requirement for a hail-in prior to landing, and 100% dockside monitoring is in place (DFO 2016h). Catches of all bycatch species are monitored through observer coverage (currently at a target of 5%) and, with the exception of common thresher shark, bycatch species are also subject to stock assessment, with Canadian catch data submitted to ICCAT for these purposes. Together, these measures comprise a partial strategy, and SG80 is met. In general, the measures don't meet the MSC definition of a full 'strategy', however, (e.g., it is not clear that there are mechanisms in place for the modification of fishing practices if unacceptable impacts were identified – GCB3.3, MSC 2013b); SG100 is not met.</p> <p>For porbeagle, there is additional focus in the fishery, with a licence condition that all live porbeagle shark are released, and that their condition upon release is required to be recorded in the log. There is also a recommended maximum porbeagle catch limit for all Canadian fisheries of 185 t (DFO 2013), which represents a mortality rate of approximately 4% (representing a mortality level which would support a recovery of the stock back to SSN20% by 2014, even under the most pessimistic productivity assumption tested in the assessment model (Campana et al. 2013)). If the 185 t catch limit was exceeded, it was confirmed by DFO (pers. comm., Canadian swordfish fishery site visit, October 2016) that this would be considered at the DFO Post-Season review, and additional measures or restrictions could be brought forward for consideration at the Atlantic Large Pelagic Advisory Council (ALPAC) in order to bring catches down (also stated in DFO 2016i). With this additional focus, it is considered that there is a strategy in place for porbeagle shark, so SG100 is met for this species.</p>		

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y – all bycatch species	Y – all bycatch species	Y – porbeagle shark N – all other bycatch species
	Justification	<p>The approach taken to the management of bycatch species is consistent with that taken in other fisheries, and contains the essential elements of effort and area limits, monitoring and, for most species, stock assessment. Catches of bycatch species in the swordfish longline fishery are low relative to the total catch of each species. There is objective basis for confidence that the partial strategy will work for retained species, and SG80 is met. Species for which there is not considered to be a strategy in place cannot meet SG100.</p> <p>For porbeagle, the stock assessment results from Campana et al. (2013) indicated that a mortality rate of 4% would result in a recovery of the stock back to the SSN20% limit reference point by 2014. Recently, there has been a reduction in the amount of porbeagle landed in the swordfish longline fishery, and only 500 kg was landed in 2015, with the vast majority therefore being returned. Analyses of post-release mortality has also been undertaken, and while there may be some differences in survival depending on specific fishing practices, porbeagle survival rates of around 30% from pelagic longline gears were reported following tagging studies (DFO 2015, Campana et al. 2016). For porbeagle shark, it is considered that the work undertaken together comprises testing that supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved; as such, SG100 is met.</p>		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y – all bycatch species	Y – porbeagle shark N – all other bycatch species
	Justification	<p>Evidence that the partial strategy (licences, areas fished, hook types, data collection, etc) is being implemented successfully is available in the form of the compliance information. As noted elsewhere, at no time throughout the certified period has there been evidence of significant compliance issues or systematic non-compliance. As such, SG80 is met. Nevertheless, bycatch species other than porbeagle shark cannot meet this SG100 level requirement as there is not considered to be a 'strategy' in place under SIa.</p> <p>For porbeagle, very little is now landed to market (500 kg in 2015), and so most are now released. The mortality rate in Canadian fisheries has now dropped to around 2%, annually (DFO 2015). This is half the rate that was expected to have allowed the stock size to grow to SSN20% by 2014 (Campana 2013); this comprises clear evidence that the strategy is being implemented successfully, so SG100 is met for this species.</p>		

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			N – all bycatch species
	Justification	Bycatch species other than porbeagle shark cannot meet this SG100 level requirement as there is not considered to be a 'strategy' in place under Sla. For porbeagle shark, following Campana et al. (2013), catch and mortality data indicate that the population is now very likely to be above the SSN20% level; however, this cannot be confirmed in the absence of an updated stock assessment. Nevertheless, a stock assessment cannot be conducted because, given the absence of a commercial fishery, up-to-date biological data on the porbeagle shark population are now limited. A fishing survey will reportedly be undertaken in summer 2017 in an effort to gather sufficient data to support an assessment process (T. Atkinson, pers. comm.), but until a new assessment is undertaken, it is not possible to say that there is sufficient evidence to confirm that porbeagle shark meets this SG100 requirement.		
References		<p>Campana, S.E., Gibson, A.J.F., Fowler, M., Dorey, A. & W. Joyce (2013). Population dynamics of Northwest Atlantic porbeagle (<i>Lamna nasus</i>), with an assessment of status and projections for recovery. DFO Canadian Science Advisory Secretariat Research Document 2012/096. iv + 84 pp.</p> <p>Campana, S.E., Joyce, W., Fowler, M. & M. Showell (2016). Discards, hooking, and post-release mortality of porbeagle (<i>Lamna nasus</i>), shortfin mako (<i>Isurus oxyrinchus</i>), and blue shark (<i>Prionace glauca</i>) in the Canadian pelagic longline fishery. ICES Journal of Marine Science, V. 73, pp. 520-528.</p> <p>DFO (2013). Canadian Atlantic Swordfish and Other Tunas Integrated Fishery Management Plan (summary available online: http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/swordfish-espardon/swordfish-2013-espardon-eng.htm).</p> <p>DFO (2015). Recovery potential assessment for porbeagle (<i>Lamna nasus</i>) in Atlantic Canada. DFO Canadian Science Advisory Secretariat Science Advisory Report 2015/048. 18 pp.</p> <p>DFO (2016i). Minutes of the Atlantic Large Pelagic Advisory Committee (ALPAC) meeting, March 9-10, 2016. Draft, September 2016. DFO, 9 pp.</p> <p>MSC (2013b). Guidance to the MSC certification requirements, version 1.3. 14 January 2013. Marine Stewardship Council, London. 254 pp.</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				N/A

PI 2.2.2 Scoring calculation

Species	Main / Minor	Sla (60, 80, 100)	Slb (60, 80, 100)	Slc (80, 100 only)	Sld (100 only)	Element score	PI Score
Blue shark	Main	80	80	80	Default 80	80	85
Porbeagle shark	Minor	100	100	100	Default 80	95	

Common thresher shark	Minor	80	80	80	Default 80	80	
White marlin	Minor	80	80	80	Default 80	80	

Evaluation Table for PI 2.2.3

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y – all bycatch species	Y – all bycatch species	N – all bycatch species
	Justification	Logbook data are required to be submitted and observer data (covering 6.8% of the swordfish catch for 2011-2015 – Table 6) are available for the swordfish longline fishery. These data cover all species taken in the fishery, and they are considered sufficient to meet SG80. However, because the observer data represent a relatively small component of the catch, and the target coverage has been increased to 10% for 2017 following a risk review (DFO, pers. comm.), it is not considered that it is currently possible to state that 'accurate and verifiable information is available; as such, SG100 is not met.		
b	Guidepost	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y – all bycatch species	Y – all bycatch species	Y – blue shark N – all other bycatch species
	Justification	<p>Stock assessments are undertaken routinely for blue shark (ICCAT 2015e) and white marlin (e.g., ICCAT 2012b), and periodically for porbeagle shark (e.g., most recently, Campana et al. 2013). Of these stock assessments, only the blue shark assessment provided information that is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty, so meeting SG100.</p> <p>For the other species (i.e., porbeagle shark and white marlin), the assessments are now a little out of date and it is not possible to estimate outcome status with a high degree of certainty. Therefore, SG80 is met, but not SG100.</p> <p>Information on common thresher shark status is limited, but the catch in the swordfish longline fishery represents just 7% of the total reported to ICCAT for the 2011-2015 period. As a minor species, SG80 is met by default.</p>		
c	Guidepost	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y – all bycatch species	Y – all bycatch species	N – all bycatch species

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
	Justification	<p>The reporting requirements and observer coverage in the swordfish longline fishery are adequate to support a partial strategy to manage main bycatch species (blue shark, only), and so SG80 is met. For all other bycatch species, SG80 is met by default.</p> <p>The recent query over discarding levels (DFO pers. comm.) is being addressed through an increase in observer coverage levels, but (unlike for retained species, the data for which are supported by 100% dockside monitoring) it is not apparent that information is also adequate to support a strategy to manage bycatch species, and evaluate with a high degree of certainty whether the strategy is achieving its objective; SG100 is not met.</p> <p>In this regard, a non-binding Recommendation (#1) is set, that options to improve the quality and consistency of discard reporting are investigated, and that any feasible approaches are implemented.</p>		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		Y – all bycatch species	N – all bycatch species
	Justification	<p>Licences in the swordfish longline fishery are capped, the entire fleet is required to operate with VMS, and vessels must hail-out prior to fishing and hail-in prior to landing. Catches are recorded in logbooks, and there is an observer program that accounted for 6.8% of the swordfish taken in the fishery for 2011-2015 (Table 6). It is considered that this information clearly means the fishery meets the SG80 requirement that sufficient data continue to be collected to detect any increase in risk level.</p> <p>Post-release mortality levels for blue shark and porbeagle shark have been quantified recently, and estimates of total mortality are therefore now available for these species (Campana et al. 2016). Estimates of post-release mortality from different fisheries have also been undertaken for thresher shark and white marlin (e.g., Cramer 2004). Nevertheless, managers are responding to an identified uncertainty over discarding levels by increasing the observer coverage (DFO pers. comm.), and while this is being worked through it is not yet clear if the monitoring is conducted in sufficient detail to assess ongoing mortalities to all retained species. As such, SG100 is not met.</p>		
References		<p>Campana, S.E., Joyce, W., Fowler, M. & M. Showell (2016). Discards, hooking, and post-release mortality of porbeagle (<i>Lamna nasus</i>), shortfin mako (<i>Isurus oxyrinchus</i>), and blue shark (<i>Prionace glauca</i>) in the Canadian pelagic longline fishery. ICES Journal of Marine Science, V. 73, pp. 520-528.</p> <p>Cramer, J. (2004). Life after catch and release. Marine Fisheries Review, V. 66, pp. 27-30.</p> <p>ICCAT (2012b). Executive summary, Report of the 2012 white marlin stock assessment meeting, Madrid, Spain, May 21-25, 2012. International Commission for the Conservation of Atlantic Tunas, Madrid, 11 pp. Available online: https://www.iccat.int/Documents/SCRS/ExecSum/WHM_ENG.pdf.</p>		

PI 2.2.3	Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch	
	<p>ICCAT(2015e). Report of the 2015 ICCAT blue shark stock assessment session, Lisbon, Portugal, July 27-31, 2015. International Commission for the Conservation of Atlantic Tunas, Madrid, 116 pp. Available online: https://www.iccat.int/Documents/Meetings/Docs/2015_BSH%20ASSESS_REPORT_ENG.pdf.</p> <p>Campana, S.E., Gibson, A.J.F., Fowler, M., Dorey, A. & W. Joyce (2013). Population dynamics of Northwest Atlantic porbeagle (<i>Lamna nasus</i>), with an assessment of status and projections for recovery. DFO Canadian Science Advisory Secretariat Research Document 2012/096. iv + 84 pp.</p> <p>Campana, S.E., Joyce, W., Fowler, M. & M. Showell (2016). Discards, hooking, and post-release mortality of porbeagle (<i>Lamna nasus</i>), shortfin mako (<i>Isurus oxyrinchus</i>), and blue shark (<i>Prionace glauca</i>) in the Canadian pelagic longline fishery. ICES Journal of Marine Science, V. 73, pp. 520-528.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		85
CONDITION NUMBER (if relevant):		N/A
RECOMMENDATION NUMBER:		1

PI 2.2.3 Scoring calculation

Species	Main / Minor	Sl _a (60, 80, 100)	Sl _b (60, 80, 100)	Sl _c (60, 80, 100)	Sl _d (80, 100 only)	Element score	PI Score
Blue shark	Main	80	100	80	80	85	85
Porbeagle shark	Minor	80	80	80	80	80	
Common thresher shark	Minor	80	80	80	80	80	
White marlin	Minor	80	80	80	80	80	

Evaluation Table for PI 2.3.1

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Y – leatherback turtle and loggerhead sea turtle	Y – leatherback turtle and loggerhead sea turtle	N – leatherback turtle and loggerhead sea turtle
	Justification	<p>Species that need to be considered against the Endangered, Threatened and Protected (ETP) performance indicators include any that are protected under international law, as well as those listed under the Canadian Species At Risk Act (SARA 2002). The listing of a species by COSEWIC (Committee on the Status of Endangered Wildlife in Canada) does not result in a species being considered under the ETP species performance indicators for MSC assessments.</p> <p>Both leatherback turtles (<i>Dermochelys coriacea</i>) and loggerhead sea turtles (<i>Caretta caretta</i>) are taken in the swordfish longline fishery (Table 6), and these are listed as 'endangered' on Schedule 1 of SARA (the listing of loggerhead sea turtle was confirmed in May 2017 – GoC 2017). Both turtle species are also listed on CITES Appendix I.</p> <p>There are no specific 'limits' (i.e., catch thresholds, allocations or quotas) that apply to the swordfish longline fishery for turtle species, other than that retention of turtles is prohibited (DFO 2016h). Nevertheless, catches are recorded by observers and estimates of total catch are made (e.g., DFO 2010, O'Boyle 2012), and recent status assessments for both species in the Northwest Atlantic are available (i.e., leatherback turtle – Tiwari et al. 2013; loggerhead sea turtle – Ceriani et al. 2015). In both cases, the recent status assessments indicate that the populations are growing, and they are considered by the IUCN to be 'least concern'. SG80 is met, but the SG100 is not met as this would require that there is "<i>negligible mortality of ETP species from the fishery</i>" (CB3.11.3.1, MSC 2013a), and it is not possible to conclude that this is the case.</p>		
b	Guidepost	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y – leatherback turtle and loggerhead sea turtle	Y – leatherback turtle and loggerhead sea turtle	N – leatherback turtle and loggerhead sea turtle
	Justification	<p>Direct effects from fishing activity are related to capture or entanglement in the fishing gear.</p> <p>The total number of leatherback turtles caught in the swordfish longline fishery is estimated to be 60-90 per year since 2006, with mortality estimates of 21%-49%, although leatherback turtle mortality in the similar US fishery is estimated at 21% (O'Boyle 2012), and recent data from the Canadian observer programme shows that of the 29 leatherback turtles observed captured in the fishery from 2011-2015,</p>		

PI 2.3.1	The fishery meets national and international requirements for the protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species
	<p>nine (31%) were released 'alive injured', and one individual was recorded 'dead' upon release (Table 7). The remainder (66%) were released 'alive uninjured', although post-release mortality may occur at a later time in some animals. If the worst case is assumed (i.e., 90 turtles entangled and 49% mortality) then the swordfish longline fishery would result in 44 leatherback turtles per year suffering mortality, equivalent to 0.13% of the adult population (estimated to be 33,810 – Tiwari et al. 2013).</p> <p>Importantly, the IUCN status assessment for leatherback turtle was recently updated, with subpopulations of the species being listed individually for the first time (Wallace et al. 2013). Tiwari et al. (2013) undertook the assessment for the Northwest Atlantic leatherback turtle subpopulation, which is the subpopulation of relevance to the swordfish longline fishery; they stated:</p> <p><i>“The Northwest Atlantic leatherback nests in the southeastern U.S.A., throughout the mainland and insular Caribbean, and the Guiana Shield, and marine habitats extend throughout the North Atlantic, including the Gulf of Mexico, north beyond 50N, into the Mediterranean, and across the equator to northwestern Africa. Several genetic nesting stocks have been identified within this subpopulation, but metapopulation dynamics support its designation as a single subpopulation, or regional management unit. Based on long-term time series datasets of abundance—i.e. annual counts of nesting females and nests—this Northwest Atlantic subpopulation is large (>50,000 nests yr⁻¹, ~10,000 females yr⁻¹) and has increased by 20.6% over the past three generations, and is projected to increase to >180,000 nests yr⁻¹ in the next generation (by 2040). Therefore, the Northwest Atlantic subpopulation is considered Least Concern under current IUCN Red List Criteria.”</i></p> <p>According to the DFO Recovery Potential Assessment for loggerhead sea turtle (DFO 2010), the swordfish longline fishery interacted with an estimated average of 1,200 loggerhead sea turtles annually between 2002 and 2008. While there is mandatory release (DFO 2016h), post hooking mortality does occur at a range of between 20% and 45%, such that 200-500 loggerhead sea turtles were estimated to die annually in the Canadian longline fishery. Because the loggerhead sea turtles caught in the fishery are oceanic and neritic juveniles, when these are converted to adult equivalents, using survivorship rates provided in the US Recovery Plan (NMFS & USFWS 2008), it is estimated that the fishery results in 5-118 adult equivalent mortalities annually for 2002-2008. In comparison, the estimated total annual adult equivalent mortality for loggerhead sea turtles in all fisheries was estimated to be 12,434 animals (NMFS & USFWS 2008), such that the annual take in the swordfish longline fishery in terms of adult equivalent values was estimated to equate to just 0.04 - 0.95% of the total fisheries impact.</p> <p>As for leatherback turtles, it is noted that the IUCN status assessment for loggerhead sea turtles was updated recently (Ceriani 2015). This latest status assessment now also lists loggerhead sea turtle subpopulations individually, rather than simply showing an overall global status for the species. The Northwest Atlantic subpopulation of loggerhead sea turtle is the subpopulation of relevance to the swordfish longline fishery, and this is listed as being 'Least Concern', with the available long-term series of annual nest counts (used as an index of population abundance) showing an overall increase over the past three generations. The 'Least Concern' status reflects that the Northwest Atlantic subpopulation did not trigger any of the thresholds and options for a threatened category under criteria A (Declining population – past, present and/or projected), B (Geographic range size, and fragmentation, decline or fluctuations), C (Small population size and fragmentation, decline, or fluctuations), or D (Very small population or very restricted distribution).</p> <p>A further recent review of loggerhead sea turtles in the Northwest Atlantic by Chapman & Seminoff (2016) reported that <i>“With the exception of lower totals for 2014 in Georgia and the Carolinas, the last five years appear to have a positive</i></p>

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species		
		<i>trend in all areas. Florida's wealth of data show a dip in the loggerhead sea population around the early 2000's but also a definite rebound in the past decade."</i> In summary, the swordfish longline fishery does catch some leatherback turtles and loggerhead sea turtles, but the direct effects are limited and the Northwest Atlantic populations of both species are increasing. While there are threats to these species, and bycatch in fisheries generally is considered to be a key concern, conservation efforts are being effective. Naturally, any catch of ETP species is undesirable, but the impacts of the swordfish longline fishery on these species are managed, and the evidence is that direct effects are highly unlikely to create unacceptable impacts; SG80 is met. SG100 is not met for leatherback turtles or loggerhead sea turtles, as the observer data are not comprehensive, so it is not possible to conclude that there is a high degree of confidence that there are no significant detrimental direct effects from the fishery to either species.		
c	Guidepost		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y – leatherback turtle and loggerhead sea turtle	Y – leatherback turtle and loggerhead sea turtle
	Justification	Indirect effects are considered to be impacts on behaviours, feeding efficiency, habitats or other aspects of ETP species' life histories. Indirect effects have been considered (DFO 2010, O'Boyle 2012) and there is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species; SG100 is met.		
References		<p>Ceriani, S.A. & Meylan, A.B. 2015. <i>Caretta caretta</i> (North West Atlantic subpopulation). The IUCN Red List of Threatened Species 2015: e.T84131194A84131608. http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T84131194A84131608.en.</p> <p>DFO (2010). Atlantic Canadian loggerhead turtle conservation action plan. Fisheries and Oceans Canada, Maritimes Region, October 2010. Available online: http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/log-turtle-tortue-caouane/index-eng.htm.</p> <p>MSC 2013a. MSC Certification Requirements, Version 1.3, 14 January 2013. Marine Stewardship Council, London, 301 pp.</p> <p>O'Boyle, R. (2012). Assessment of leatherback turtle (<i>Dermochelys coriacea</i>) fisheries and non-fisheries related interactions in Atlantic Canadian waters. Canadian Science Advisory Secretariat, Research Document 2012/063. 99 pp.</p> <p>Tiwari, M., Wallace, B.P. & M. Girondot (2013). <i>Dermochelys coriacea</i> (Northwest Atlantic Ocean subpopulation). The IUCN Red List of Threatened Species 2013: e.T46967827A46967830. http://dx.doi.org/10.2305/IUCN.UK.2013-2.RLTS.T46967827A46967830.en.</p> <p>Wallace, B.P., Tiwari, M. & M. Girondot (2013). <i>Dermochelys coriacea</i>. The IUCN Red List of Threatened Species 2013: e.T6494A43526147. http://dx.doi.org/10.2305/IUCN.UK.2013-2.RLTS.T6494A43526147.en.</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				
85				

PI 2.3.1	<p>The fishery meets national and international requirements for the protection of ETP species.</p> <p>The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species</p>
CONDITION NUMBER (if relevant):	N/A

Evaluation Table for PI 2.3.2

PI 2.3.2		The fishery has in place precautionary management strategies designed to: <ul style="list-style-type: none"> • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place that minimise mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y – leatherback turtle and loggerhead sea turtle	Y – leatherback turtle and loggerhead sea turtle	N – leatherback turtle and loggerhead sea turtle
	Justification	<p>The swordfish longline fishery has had a focus on turtle bycatch since the early 2000s, and the development of the strategy for managing impacts on turtles is summarised in DFO 2010; this states:</p> <p><i>"In 2001 and 2002, the Nova Scotia Swordfishermen's Association (NSSA) obtained funding through Environment Canada's Habitat Stewardship Fund to pay for increased observer coverage to determine the extent and possible means for mitigation of sea turtle by-catch by their fleet. In 2003, the NSSA developed a Code of Conduct for Responsible Sea Turtle Handling and Mitigative Measures, which was added to the fleet's Conservation Harvesting Plan in 2004. This voluntary Code of Conduct is attached to fleet licence conditions. Included are measures such as avoiding areas of high sea turtle capture rates, notifying all vessels operating in the area if high sea turtle capture rates are encountered, gear hauling protocols to minimize harm to any turtles that may be captured, and sea turtle handling guidelines and usage instructions for de-hooking gear. Over the course of 2003-2004, de-hooking and line-cutting kits were purchased by the NSSA to supply each active vessel in the fishery. In 2008, representatives from all vessels currently active in this fishery received training and certification in the use of this equipment through a workshop given by the US National Marine Fisheries Service. The majority (90%) of the fleet now uses circle hooks to increase the chances of survival for some discarded species. Also, the typical gear configuration allows sea turtles to get to the surface to breathe, which enables live release in nearly all cases. Other measures currently in place include mandatory release of loggerhead sea turtles, tracking of vessels via Vessel Monitoring System (VMS), 5% observer coverage of fishing trips, and an additional 5% in 2009/10 and 2010/2011 to better determine the level of precision of encounter estimates and to improve spatial coverage."</i></p> <p>Further, vessels are now required by licence condition to use corrodible, circle hooks, and to carry dehooking/disentangling gear, while the licence-holder/operator is also now required to hold a valid certificate showing they have completed a turtle dehooking/disentanglement course (DFO 2016h). Fishermen are also required to carry and submit SARA logbooks (recording encounters with ETP species) at the end of each trip.</p> <p>There is clearly a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to be highly</p>		

PI 2.3.2		The fishery has in place precautionary management strategies designed to: <ul style="list-style-type: none">• Meet national and international requirements;• Ensure the fishery does not pose a risk of serious harm to ETP species;• Ensure the fishery does not hinder recovery of ETP species; and• Minimise mortality of ETP species.		
		likely to achieve national and international requirements for the protection of ETP species; SG80 is met. SG100 is not met, as a comprehensive strategy is considered to be a “ <i>complete and tested strategy made up of linked monitoring, analyses, and management measures and responses</i> ” (GCB3.3, MSC 2013b), and it is not clear how consistently well followed are the voluntary elements (e.g., avoiding areas of high sea turtle capture rates).		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Y – leatherback turtle and loggerhead sea turtle	Y – leatherback turtle and loggerhead sea turtle	N – leatherback turtle and loggerhead sea turtle
	Justification	The elements of the strategy for turtles are generally consistent with those used in other fisheries (i.e., circle hooks, lines set shallow enough to allow captured turtles to reach the surface to breathe, handling protocols, observer coverage at target levels, etc.), so meeting SG60. The requirement for training in the use of dehooking/disentangling gear and that it is carried, together with observer data (including information on status post-dehooking) and the latest status assessments for leatherback turtles (Tiwari et al. 2013) and loggerhead sea turtles (Ceriani et al. 2015), indicate that there is an objective basis for confidence that the strategy will work, based on information directly about the fishery and the species involved; SG80 is also met. Quantitative analysis of the observer data indicates that the coverage levels should be higher if a more accurate count of turtle interactions is to be obtained; Hanke et al. (2012) determined that around 20% observer coverage is likely to give a coefficient of variation of at least 30% for species such as sharks and turtles taken in the swordfish longline fishery. As such, SG100 is not met.		
c	Guidepost		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y – leatherback turtle and loggerhead sea turtle	N – leatherback turtle and loggerhead sea turtle

PI 2.3.2		The fishery has in place precautionary management strategies designed to: <ul style="list-style-type: none">• Meet national and international requirements;• Ensure the fishery does not pose a risk of serious harm to ETP species;• Ensure the fishery does not hinder recovery of ETP species; and• Minimise mortality of ETP species.		
	Justification	Vessels are now required by licence condition to use corrodible, circle hooks, and to carry dehooking/disentangling gear, while the licence-holder/operator is also now required to hold a valid certificate showing they have completed a turtle dehooking/disentanglement course (DFO 2016h). In discussions during the site visit, there was no indication from any stakeholder that there were concerns that these requirements were not being followed; SG80 is met. SG100 is not met, but could be supported if a higher level of observer coverage was in place to provide greater confidence that the voluntary elements of the strategy are followed.		
d	Guidepost			There is evidence that the strategy is achieving its objective.
	Met?			Y – leatherback turtle and loggerhead sea turtle
	Justification	The nesting habitats of the Northwest Atlantic subpopulations of leatherback turtles and loggerhead sea turtles that are of relevance to the swordfish longline fishery are found far to the south of Canada, on the coasts of northern South America, the Caribbean and Gulf of Mexico. The most significant loggerhead sea turtle nesting sites are found on the Florida coast. During the egg and hatching phases they are vulnerable to nest robbing, light pollution and predation. The animals then range extensively through their juvenile and adult lives, where they are vulnerable to impacts from fishing and other human activities as well as predation. Any measures adopted in Canadian waters to protect marine turtles and minimise impacts therefore need to be part of a wider effort if they are to be successful. In effect, the latest IUCN status assessments that show growth in the Northwest Atlantic subpopulations of both leatherback turtle and loggerhead sea turtle, and status of 'least concern', provide evidence that this effort is being successful. This SG100 requirement is met.		
References		Ceriani, S.A. & Meylan, A.B. 2015. <i>Caretta caretta</i> (North West Atlantic subpopulation). The IUCN Red List of Threatened Species 2015: e.T84131194A84131608. http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T84131194A84131608.en . DFO (2010). Atlantic Canadian loggerhead turtle conservation action plan. Fisheries and Oceans Canada, Maritimes Region, October 2010. Available online: http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/log-turtle-tortue-caouane/index-eng.htm . DFO (2016h). 2016 Canadian Atlantic swordfish longline conditions. Department of Fisheries and Oceans Canada. 9 pp. Hanke, A.R., Andrushchenko, I., and G. Croft (2012). Observer Coverage of the Atlantic Canadian Swordfish and Other Tuna Longline Fishery: An Assessment of Current Practices and Alternative Methods. DFO Canadian Science Advisory Secretariat Research Document 2012/049. iii + 84 pp. MSC 2013b. Guidance to the MSC Certification Requirements, Version 1.3. 14 January 2013. Marine Stewardship Council, London,” 254 pp. Tiwari, M., Wallace, B.P. & M. Girondot (2013). <i>Dermochelys coriacea</i> (Northwest Atlantic Ocean subpopulation). The IUCN Red List of Threatened Species 2013:		

PI 2.3.2	The fishery has in place precautionary management strategies designed to to: <ul style="list-style-type: none">• Meet national and international requirements;• Ensure the fishery does not pose a risk of serious harm to ETP species;• Ensure the fishery does not hinder recovery of ETP species; and• Minimise mortality of ETP species.		
	e.T46967827A46967830. http://dx.doi.org/10.2305/IUCN.UK.2013-2.RLTS.T46967827A46967830.en .		
OVERALL PERFORMANCE INDICATOR SCORE:			85
CONDITION NUMBER (if relevant):			N/A

Evaluation Table for PI 2.3.3

PI 2.3.3		Relevant information is collected to support the management of fishery impacts on ETP species, including: <ul style="list-style-type: none"> Information for the development of the management strategy; Information to assess the effectiveness of the management strategy; and Information to determine the outcome status of ETP species. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y – leatherback turtle and loggerhead sea turtle	Y – leatherback turtle and loggerhead sea turtle	N – leatherback turtle and loggerhead sea turtle
	Justification	<p>Observer data are available from the swordfish longline fishery from at least 2001 and, together with estimates of post-hooking mortality rates, these have been used to quantitatively estimate the impact of the swordfish longline fishery on leatherback turtles and loggerhead turtle (e.g., DFO 2010, O'Boyle 2012); SG80 is met.</p> <p>The observer coverage is not sufficiently comprehensive for SG100 to be met, although the fishery has at various times increased the level of coverage to improve the quality of the data collected (DFO 2010). Most recently, DFO increased the target level to 10% for 2017 in response to a risk review (DFO pers. comm.).</p> <p>In this regard, a non-binding Recommendation (#2) is set. This is that the client support and pursue a re-running of the Regional Peer Review assessment of incidental catch in the Atlantic Canadian swordfish/other tuna longline fishery (i.e., DFO 2016k), or a similar process, to review the approach to incidental catch monitoring in the longline swordfish fishery. A key aim should be to determine what, if any, changes are needed to the observer programme to ensure that the data collected are adequately representative of the fishery.</p>		
b	Guidepost	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y – leatherback turtle and loggerhead sea turtle	Y – leatherback turtle and loggerhead sea turtle	N – leatherback turtle and loggerhead sea turtle

PI 2.3.3		Relevant information is collected to support the management of fishery impacts on ETP species, including: <ul style="list-style-type: none">• Information for the development of the management strategy;• Information to assess the effectiveness of the management strategy; and• Information to determine the outcome status of ETP species.		
	Justification	<p>Information on turtle catches and mortality rates in the swordfish longline fishery is available (DFO 2010, O'Boyle 2012), although a study to better estimate post-hooking mortality rates in loggerhead sea turtles is currently underway, with the aim of deploying the final set of tags on these animals in the summer of 2017 (DFO 2016g).</p> <p>Recent status assessments for both turtle species in the Northwest Atlantic are available (i.e., leatherback turtle – Tiwari et al. 2013; loggerhead sea turtle – Ceriani et al. 2015). In both cases, the recent status assessments indicate that the populations are growing, and they are considered by the IUCN to be 'least concern'. Essentially, information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species, and so SG80 is met.</p> <p>As noted for S1a, the fishery has at various times increased the level of coverage to improve the quality of the data collected (DFO 2010). With the current level of data, and without the completion of the ongoing study in to post-hooking mortality in loggerhead sea turtles, SG100 is not met.</p> <p>A non-binding Recommendation was set in the Year 4 audit report for the last certification period (Knapman et al. 2017). This was that the client provides DFO with clear and well publicised support for the timely completion of the loggerhead sea turtle tagging study through advocating to the swordfish longline fishermen of the need to identify and fulfil suitable opportunities to take DFO tagging staff on swordfish and combined swordfish and tuna longline trips in 2017. This non-binding Recommendation (#3) is repeated here, and will be reiterated annually until such time as the study is completed.</p>		
c	Guidepost	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	Y – leatherback turtle and loggerhead sea turtle	Y – leatherback turtle and loggerhead sea turtle	N – leatherback turtle and loggerhead sea turtle
	Justification	<p>As noted previously, observer data are available from the swordfish longline fishery from at least 2001 and, together with estimates of post-hooking mortality rates, these have been used to quantitatively estimate the impact of the swordfish longline fishery on leatherback turtles and loggerhead turtle (e.g., DFO 2010, O'Boyle 2012). In addition, every vessel is required to carry VMS, such that spatial and temporal distribution of fishing activity is known (e.g., see Figure 1). The numbers of fishing days, longline sets and hooks fished are also available over time. These data mean that information is sufficient to measure trends and support a full strategy to manage impacts on ETP species; SG80 is met.</p> <p>Consistent with the scoring elsewhere, the observer coverage in the swordfish longline fishery is not sufficiently comprehensive for SG100 to be met.</p>		
References		Ceriani, S.A. & Meylan, A.B. 2015. <i>Caretta caretta</i> (North West Atlantic subpopulation). The IUCN Red List of Threatened Species 2015: e.T84131194A84131608. http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T84131194A84131608.en .		

PI 2.3.3	<p>Relevant information is collected to support the management of fishery impacts on ETP species, including:</p> <ul style="list-style-type: none">• Information for the development of the management strategy;• Information to assess the effectiveness of the management strategy; and• Information to determine the outcome status of ETP species.	
	<p>DFO (2010). Atlantic Canadian loggerhead turtle conservation action plan. Fisheries and Oceans Canada, Maritimes Region, October 2010. Available online: http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/log-turtle-tortue-caouane/index-eng.htm.</p> <p>DFO (2016g). Progress Report: Loggerhead turtle post-release survival study. Department of Fisheries and Oceans Canada, September 20, 2016, 2 pp.</p> <p>DFO (2016k). Proceedings of the regional peer review assessment of incidental catch in the Atlantic Canadian swordfish/other tuna longline fishery. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2016/nnn.</p> <p>Knapman, P., Stokes, K. & R. Blyth-Skyrme (2017). On-site surveillance visit – report for the North West Atlantic Canada longline swordfish fishery. Acoura Marine, Scotland, 118 pp.</p> <p>O’Boyle, R. (2012). Assessment of leatherback turtle (<i>Dermochelys coriacea</i>) fisheries and non-fisheries related interactions in Atlantic Canadian waters. Canadian Science Advisory Secretariat, Research Document 2012/063. 99 pp.</p> <p>Tiwari, M., Wallace, B.P. & M. Girondot (2013). <i>Dermochelys coriacea</i> (Northwest Atlantic Ocean subpopulation). The IUCN Red List of Threatened Species 2013: e.T46967827A46967830. http://dx.doi.org/10.2305/IUCN.UK.2013-2.RLTS.T46967827A46967830.en.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		N/A
RECOMMENDATION		2 & 3

Evaluation Table for PI 2.4.1

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	Y	Y
	Justification	The swordfish longline fishery is prosecuted with surface drifting longline gear that never comes in to contact with the seabed. Gear loss (and subsequent fouling of the seabed) is also highly unlikely on anything other than a trivial scale due to the use of intermediate floats that are used to support the mainline, meaning that even if the end buoys are lost (for example due to being run over by a large ship), the gear should be recovered. Vessels also stay with their gear between setting and retrieval, so also helping to minimise the potential for lost gear. The fishery meets SG100.		
References		None.		
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				N/A

Evaluation Table for PI 2.4.2

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	Y
	Justification	The swordfish longline fishery is prosecuted with surface drifting longline gear that never comes in to contact with the seabed. Gear loss (and subsequent fouling of the seabed) is also highly unlikely on anything other than a trivial scale due to the use of intermediate floats that are used to support the mainline. Together, these features of the fishery act as a defacto strategy to manage impacts on habitats. The fishery meets SG100.		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	Y	N
	Justification	Although it is a feature of the design of the gear and the location it is used in that significant seabed impacts are highly unlikely, to the knowledge of the Assessment Team, no studies have been undertaken to determine the extent to which the surface longline gear used in the swordfish fishery impacts the seabed. As such, while there is clearly objective confidence that the defacto strategy will work, so meeting SG80, SG100 is not met because it is not possible to state that testing has been undertaken to determine that the defacto strategy will work.		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	The swordfish longline fishery employs pelagic longline gear. There is clear evidence that this is the case, and that the defacto strategy is therefore being implemented successfully. SG100 is met.		

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
d	Guidepost			There is some evidence that the strategy is achieving its objective.
	Met?			Y
	Justification	The swordfish longline fishery employs pelagic longline gear. There is clear evidence that this is the case, and therefore there is some evidence that the defacto strategy is achieving its objective; SG100 is met.		
References		None		
OVERALL PERFORMANCE INDICATOR SCORE:				95
CONDITION NUMBER (if relevant):				N/A

Evaluation Table for PI 2.4.3

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	Y
	Justification	The Scotian Shelf and offshore banks such as Georges Bank and the Grand Bank at the southern and northern edge of the fishing area have been mapped in moderate to high detail (e.g., Brown et al. 2011, C-NLOPB 2014, Kostylev et al. 2001, Kostylev et al. 2004), as have the canyons and shelf edge with respect to the presence of sensitive habitats such as corals and sponges (e.g., Kenchington et al. 2010, Kenchington et al. 2016). However, the surface drifting longline gear that is employed in the swordfish longline fishery is highly unlikely to ever come in to contact with these habitats unless the gear is lost, but that is also considered very unlikely. As such, it is considered that the distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types – SG100 is met.		
b	Guidepost	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	N
	Justification	The surface drifting longline gear that is employed in the swordfish longline fishery is highly unlikely to ever come in to contact with seabed habitats unless the gear is lost, but that is also considered very unlikely. The areas fished are known (e.g., see Figure 1), and so SG80 is met. Although seabed impacts are highly unlikely given the nature of the gear and its mode of operation, it is not possible to say that physical impacts of the gear on the habitat types have been quantified fully. As such, SG100 is not met. In this regard, a non-binding Recommendation (#4) is set on the fishery. This is that information on the amounts and locations of any lost gear (i.e., number of hooks and floats, length of mainline, etc.) are recorded centrally and reported annually. This would help to inform the assessment of risk to habitats and may allow for higher scores to be generated.		
c	Guidepost		Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types		
	Met?		Y	Y
	Justification	Data on fishing areas and fishing practices, sufficient to detect any increase in risk to habitats, continue to be collected routinely through the use VMS and at-sea observers – SG80 is met. While there is very little vulnerability of seabed habitats to the surface drifting longline gear employed in the swordfish longline fishery, efforts continue to better map the distribution of particularly sensitive habitats (e.g., Kenchington et al. 2016 presents the results of newly completed research in to significant benthic areas), and the information base is improving constantly – it is considered that this meets SG100.		
References		<p>Brown, C.J., Todd, B.J., Kostylev, V.E. & R.A. Pickrill (2011). Image-based classification of multibeam sonar backscatter data for objective surficial sediment mapping of Georges bank, Canada. Continental Shelf Research, V. 31, pp. S110-S119.</p> <p>C-NLOPB (2014). Eastern Newfoundland strategic environmental assessment, final report. Canada-Newfoundland and Labrador Offshore Petroleum Board, August, 527 pp.</p> <p>Kenchington, E., Lirette, C., Cogswell, A., Archambault, D., Archambault, P., Benoit, H., Bernier, D., Brodie, B., Fuller, S., Gilkinson, K., Lévesque, M., Power, D., Siferd, T., Treble, M., & V. Wareham (2010). Delineating coral and sponge concentrations in the biogeographic regions of the East Coast of Canada using spatial analyses. Canadian Science Advisory Secretariat Research Document 2010/041. 202 pp.</p> <p>Kenchington, E., Beazley, L., Lirette, C., Murillo, F.J., Guijarro, J., Wareham, V., Gilkinson, K., Koen-Alonso, M., Benoit, H., Bourdages, H., Sainte-Marie, B., Treble, M. & T. Siferd (2016) Delineation of coral and sponge significant benthic areas in Eastern Canada using kernel density analyses and species distribution models. Canadian Science Advisory Secretariat Research Document 2016/093. 184 pp.</p> <p>Kostylev, V.E., Todd, B.J., Fader, G.B.J., Courtney, R.C., Cameron G.D.M. & R.A. Pickrill (2001). Benthic habitat mapping on the Scotian Shelf based on multibeam bathymetry, surficial geology and sea floor photographs. Marine Ecology Progress Series, V. 219, pp. 121-137.</p> <p>Kostylev, V.E. (2004). Habitat management template for Scotian shelf habitat mapping. Natural Resources Canada, Progress report for horizontal NRCan – DFO habitat mapping project. 35 pp.</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				95
CONDITION NUMBER (if relevant):				N/A
RECOMMENDATION				4

Evaluation Table for PI 2.5.1

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Y	Y	Y (partial)
	Justification	<p>Given the geographical extent of the fishery (Canadian as well as international waters), and the range of the target species, the fishery is considered to occur within the pelagic ecosystem of the Northwest Atlantic. The key ecosystem element is considered to be trophic structure and function.</p> <p>An extensive discussion on the potential for the swordfish fishery to disrupt trophic structures in the pelagic system was provided in the first certification report for the fishery (IMM 2012). Their review included consideration of changes in biomass, species composition and size structures of large predators, and of trophic level overall. The conclusion at that time was that there was some evidence that the swordfish fishery was highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm, in part because the fishery accounts for a low proportion of the pelagic fishing effort and landings in the North Atlantic.</p> <p>Such a conclusion is also reached in this latest assessment. The catch from the swordfish longline fishery represents a small proportion of the total catch of any species taken in recent years (e.g., around 10% for swordfish (Table 2), 0.2% for bigeye tuna, 2.7% for bluefin tuna, 2.3% for shortfin mako shark, 0.1% for yellowfin tuna, 0.1% for albacore tuna, 4% for blue shark, approximately 20% for porbeagle (although the Canadian directed fishery is now closed – DFO 2016j), around 7% for common thresher shark, and 2% for white marlin). In addition, the median size of swordfish taken in the longline fishery has varied without trend over recent years, and was above the long term average in 2011 (Andrushchenko & Hanke 2016), while with the exception of bigeye tuna (ICCAT 2015d), the stock assessments for these species indicate that the stocks are likely to be within biological limits (see Section 3.6.2 for details).</p> <p>In conclusion, there is some evidence that the swordfish longline fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. The Assessment Team is not aware of any specific modelling work (e.g., with Ecopath and Ecosim) that has been undertaken to investigate the Northwest Atlantic pelagic ecosystem in detail, so it isn't possible to score the fishery at 100 for this SI, but a partial score of 90 is awarded.</p>		
References		<p>Andrushchenko, I. & A.R. Hanke (2015). Updated CPUE from the Canadian swordfish longline fishery, 2003-2013. Collective Volume of Scientific Papers – ICCAT, V. 60, pp. 1914-1942. Available online: https://www.iccat.int/Documents/CVSP/CV071_2015/n_5/CV071052132.pdf.</p> <p>DFO (2016j). Shark fisheries. DFO web publication, last updated 2016-12-19: http://dfo-mpo.gc.ca/species-especes/sharks/info/fisheries-eng.html</p> <p>ICCAT (2015d). Executive summary, Report of the 2015 ICCAT bigeye tuna stock assessment session, Madrid, Spain, July 13-17, 2015. International Commission for the Conservation of Atlantic Tunas, Madrid, 19 pp. Available online: https://www.iccat.int/Documents/SCRS/ExecSum/BET_ENG.pdf</p>		

PI 2.5.1	The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function	
	IMM (2012). North Atlantic Swordfish (<i>Xiphias gladius</i>) Canadian pelagic longline fishery, Volume 1, public certification report. Intertek Moody Marine, Dartmouth, Canada. 244 pp.	
OVERALL PERFORMANCE INDICATOR SCORE:		90
CONDITION NUMBER (if relevant):		N/A

Evaluation Table for PI 2.5.2

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	N
	Justification	<p>The swordfish longline fishery is considered to occur within the pelagic ecosystem of the Northwest Atlantic, and the key ecosystem element is considered to be trophic structure and function.</p> <p>DFO has also raised the profile of ecosystem management considerations through the introduction of the EBSAs. While identification as an EBSA does not afford an area any particular legal status, it does draw attention to an area's high ecological or biological significance, and may promote the application of higher standards of management (DFO 2009d). The Scotian slope EBSA and Emerald basin and the Scotian Gulf EBSA have been identified in part for swordfish (King et al. 2016).</p> <p>There is consideration of management of trophic structure acknowledged in the fishery's IFMP. General management tools to support productivity and biodiversity objectives are listed as including licensing, catch and effort controls, size-based limits, area/season closures, etc. (DFO 2013).</p> <p>The management measures in place in the fishery to limit catches of swordfish and other large pelagic species act as a functional partial strategy to achieve ecosystem management objectives, and there is some evidence that the swordfish longline fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. As such, SG80 is met.</p> <p>SG100 is not met as there is not a specific ecosystem management 'strategy' in place in the fishery.</p>		
b	Guidepost	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	<p>The strategy, which consists of a plan, contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem.</p> <p>This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.</p>
	Met?	Y	Y	N

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
	Justification	<p>The partial strategy in place for the Canadian swordfish longline fishery (i.e., including licensing, catch and effort controls, size-based limits, area/season closures, etc.) is designed in consideration of wider Northwest Atlantic fisheries exploitation patterns and management, which is intended to constrain these fisheries to catches that achieve maximum sustainable yield of the high trophic level target species (i.e., swordfish, tunas, sharks). The partial strategy clearly takes into account available information (e.g., stock assessment results) and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance; SG80 is met.</p> <p>SG100 cannot be met as there is not considered to be a full 'strategy' in place (see Sla).</p>		
c	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Y	Y	N
	Justification	<p>As noted for Slb, the partial strategy in place for the Canadian swordfish longline fishery (i.e., including licensing, catch and effort controls, size-based limits, area/season closures, etc.) is designed in consideration of wider Northwest Atlantic fisheries exploitation patterns and management, which is intended to constrain these fisheries to catches that achieve maximum sustainable yield of the high trophic level target species (i.e., swordfish, tunas, sharks).</p> <p>Given the wide-ranging nature of these species, Canada's management of the fishery in consideration of the wider Northwest Atlantic context is critical, and means that the partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems), and so SG80 is met for this SI.</p> <p>Consistent with Slb and the practice that the highest score cannot be awarded for this SI in the absence of a full 'strategy' (see Sla), SG100 is not met.</p>		
d	Guidepost		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Y	(N)
	Justification	<p>The partial strategy in place (licensing, catch and effort controls, size-based limits, area/season closures, etc. are implemented through the licence conditions in the swordfish longline fishery. There was no indication given to the Assessment Team that there are any particular compliance or enforcement concerns regarding this fishery. As such, SG80 is met.</p> <p>Consistent with Slb and the practice that the highest score cannot be awarded for this SI in the absence of a full 'strategy' (see Sla), SG100 is not met.</p>		
References		DFO (2009d). Large Ocean Management Areas. http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/loma-zego/index-eng.htm .		

PI 2.5.2	There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function	
	<p>DFO (2013) Integrated Fisheries Management Plans (IFMPs) for swordfish and other tuna species (albacore, bigeye and yellowfin tuna) http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/swordfish-espado/NEW-swordfish-2013-espado-eng.htm</p> <p>King, M., Fenton, D., Aker, J. & A. Serdynska (2016). Offshore ecologically and biologically significant areas in the Scotian Shelf Bioregion. DFO Canadian Science Advisory Secretariat Research Document 2016/007. viii + 92 pp.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		N/A

Evaluation Table for PI 2.5.3

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	<p>The swordfish longline fishery is considered to occur within the pelagic ecosystem of the Northwest Atlantic, and the key ecosystem element is considered to be trophic structure and function.</p> <p>Although the links and interdependencies between different trophic levels can be complex, the relationships between different predator and prey species in pelagic ecosystems are broadly understood, including the implications of catastrophic loss of top predators out of the system (e.g., Myers et al. 2007, Heithaus et al. 2008, Baum & Worm 2009). SG80 is met.</p>		
b	Guidepost	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated in detail.
	Met?	Y	Y	N
	Justification	<p>As noted against PI 2.5.1, the catch from the swordfish longline fishery represents a small proportion of the total catch of any species, while the median size of swordfish taken in the longline fishery has varied without trend over recent years, and was above the long-term average in 2011 (Andrushchenko & Hanke 2016). With the exception of bigeye tuna (ICCAT 2015d), the stock assessments for these species indicate that the stocks are likely to be within biological limits (see Section 3.6.2 for details).</p> <p>As the key ecosystem element is considered to be structure and function of the Northwest Atlantic pelagic ecosystem, it is clear that the main impacts of the fishery on this element can be inferred as being all but negligible. The information available from stock assessments of the different species taken in the fishery are considered to demonstrate that some of the main impacts have been investigated in detail; SG80 is met.</p> <p>To the knowledge of the assessment team, there is no ecosystem model for the pelagic ecosystem of the Northwest Atlantic. In the absence of such a model, it is not possible to say that SG100 is met.</p>		

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
c	Guidepost		The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?		Y	N
	Justification	<p>Population size, growth rates, distribution, migration timing and prey preferences (i.e., the main functions) are known for target, retained, bycatch and ETP species, while habitat distribution is also known (although the surface drifting longline gear used in the fishery does not come into contact with the seabed unless lost, which is considered likely to be a very rare event); SG80 is met.</p> <p>The impacts of the swordfish longline fishery on these components are identified, but it is not possible to be confident that the main functions are 'understood'. As such, and because some of SG100 is not met, SG100 is not met overall.</p>		
d	Guidepost		Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Y	Y
	Justification	<p>As noted against PI 2.5.1, the catch from the swordfish longline fishery represents a small proportion of the total catch of any species, while the median size of swordfish taken in the longline fishery has varied without trend over recent years, and was above the long term average in 2011 (Andrushchenko & Hanke 2016). With the exception of bigeye tuna (ICCAT 2015d), the stock assessments for the retained and bycatch species indicate that the stocks are likely to be within biological limits (see Section 3.6.2 for details), while the Northwest Atlantic subpopulations of leatherback turtle and loggerhead sea turtle are assessed as least concern and are growing (Tiwari et al. 2013, Ceriani et al. 2015).</p> <p>Overall, there is information on the impact of the swordfish longline fishery on all the relevant components, as well as sufficient information on the relative impact of the fishery on the trophic structure and function, to be allow the main consequences for the ecosystem to be inferred; SG100 is met.</p>		
e	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?		Y	N

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem
	Justification	<p>Data on catch, total effort, and the distribution of effort in the swordfish longline fishery continue to be collected, and these are sufficient to detect any increase in risk level, so meeting SG80.</p> <p>It is noted that DFO has recently increased the target observer coverage to 10%, following a review indicating that there was some uncertainty over the level of discarding from the fishery (DFO, pers. comm.). While this issue is being worked through, SG100 (requiring that information is sufficient to support the development of strategies to manage ecosystem impacts) is not met.</p>
	References	<p>Andrushchenko, I. & A.R. Hanke (2015). Updated CPUE from the Canadian swordfish longline fishery, 2003-2013. Collective Volume of Scientific Papers – ICCAT, V. 60, pp. 1914-1942. Available online: https://www.iccat.int/Documents/CVSP/CV071_2015/n_5/CV071052132.pdf.</p> <p>Ceriani, S.A. & Meylan, A.B. 2015. <i>Caretta caretta</i> (North West Atlantic subpopulation). The IUCN Red List of Threatened Species 2015: e.T84131194A84131608. http://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T84131194A84131608.en.</p> <p>ICCAT (2015d). Executive summary, Report of the 2015 ICCAT bigeye tuna stock assessment session, Madrid, Spain, July 13-17, 2015. International Commission for the Conservation of Atlantic Tunas, Madrid, 19 pp. Available online: https://www.iccat.int/Documents/SCRS/ExecSum/BET_ENG.pdf</p> <p>Tiwari, M., Wallace, B.P. & M. Girondot (2013). <i>Dermochelys coriacea</i> (Northwest Atlantic Ocean subpopulation). The IUCN Red List of Threatened Species 2013: e.T46967827A46967830. http://dx.doi.org/10.2305/IUCN.UK.2013-2.RLTS.T46967827A46967830.en.</p>
OVERALL PERFORMANCE INDICATOR SCORE:		85
CONDITION NUMBER (if relevant):		N/A

Evaluation Table for PI 3.1.1

The “Governance and Policy” component of Principle 3 (the PIs pre-fixed with 3.1) focuses on the high level context of the fishery management system within the UoA. In this instance, there are two aspects of the management that need to be taken into account – the international (ICCAT) and the domestic (Canada).

PI 3.1.1		The management system exists within an appropriate legal and/or customary framework which ensures that it: <ul style="list-style-type: none"> Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and Incorporates an appropriate dispute resolution framework. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Y	Y	N
	Justification	<p>ICCAT The International Convention for the Conservation of Atlantic Tunas (ICCAT 2007) is the formal document that establishes the international legal and administrative structure for the management of tuna and tuna-like stocks, i.e. swordfish, in the Atlantic.</p> <p>The Convention establishes that ICCAT is the only organisation that can undertake the range of work required for the study and management of tunas and tuna-like fishes in the Atlantic. ICCAT is responsible for the coordination of research and data collection and analysis by the Contracting Parties and Cooperating Non-Contracting Parties (CPCs).</p> <p>Under the Convention, the CPCs undertake to collaborate and carry out studies on target fish stock biology and abundance and data collection and analysis on current conditions and trends on target fish stocks and other fish species caught incidentally, such as sharks. Each year, scientists from the CPCs present their latest results to the pertinent ICCAT Species Groups and to the Standing Committee on Research and Statistics (SCRS). From time to time, the advances made by groups or individual investigators are adopted as the most up-to-date information and become part of the knowledge base used in stock assessments.</p> <p>Each year, the Commission adopts a number of Recommendations for the management of stocks, e.g. catch quotas and minimum sizes for a given stock. ICCAT Recommendations are binding only insofar as the CPCs agree to implement them domestically. Each recommendation becomes effective for all CPCs six months after the date of the notification from the Commission.</p> <p>Canada Within Canada's EEZ, there is a well-established legislative framework. The federal Minister of Fisheries and Oceans has the ultimate responsibility for the fishery and his/her authority is delegated to officials through the organizational structure of the Department of Fisheries and Oceans (DFO), i.e. there is a formal and binding system for the cooperation between national entities at the federal and regional level. The Fisheries Act 1985 provides the legislative basis for the implementation of regulations, e.g. The Fishery (General) Regulations 1993 and the Atlantic Fishery Regulations 1985, that, among other things,</p>		

PI 3.1.1		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none">• Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and• Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and• Incorporates an appropriate dispute resolution framework.		
		<p>provide for the issuing of fishing licences and prescription of conditions for the operation of the fishery. The Species at Risk Act 2002 and the Oceans Act 1996 provide the framework for implementing domestic management in a manner consistent with MSC Principle 2.</p> <p>Internationally Canada is a signatory to the FAO Code of Conduct, United Nations Convention on the Law of the Sea (UNCLOS) and United Nations Fisheries Agreement (UNFA) and, as well as being a member of ICCAT is also a member of several other Regional Fisheries Management Organisations (RFMOs), e.g. Northwest Atlantic Fisheries Organization (NAFO).</p> <p>Therefore, it is considered there is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2. The fishery meets SG60 and SG80. Since there are no binding procedures in ICCAT, the fishery does not meet SG100.</p>		
b	Guidepost	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery.	The management system incorporates or subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective.
		Met?	Y	Y
	Justification	<p>ICCAT</p> <p>ICCAT has a tradition of making decisions by consensus and resolving disputes informally, e.g. ICCAT members discuss issues in species panels, approving panel reports and raising relevant issues at Commission sessions providing a full airing of concerns in an effort to avoid disputes. However, in cases where disputes cannot be settled, the ICCAT Convention provides a process of objection allowing individual Contracting Parties to withdraw from endorsing and implementing an ICCAT recommendation (ICCAT Convention Article VIII (2,3). This procedure has been used fairly infrequently in the course of ICCAT's history; 12 times since 1969, with 7 of these being objections raised by two member states with respect to their blue fin tuna allocation (Spencer et al 2016).</p> <p>ICCAT's Conservation and Management Measures Compliance Committee monitors compliance with the Convention and ICCAT recommendations (ICCAT recommendations are binding insofar as the Contracting Party agree to implement them domestically). This Committee has the potential to address disputes over implementation of ICCAT recommendations, but to date it has been generally ineffective. While exceeding TAC allocations for North Atlantic swordfish has not generally been a problem, there are numerous examples of catches in excess of TACs for other stocks without punitive action or mitigation (Spencer et al 2016).</p> <p>ICCAT has recognised the need for a more formal dispute settlement procedure for some time and a Working Group on Convention Amendment were tasked with looking at this issue in 2012 (Spencer et al 2016). At the last ICCAT meeting in 2016 this issue had still not been resolved, the sticking point apparently being on whether dispute settlement procedures would be</p>		

PI 3.1.1	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 			
		<p>compulsory or not, i.e., whether procedures could only be instituted jointly by all parties to a dispute or, instead, by a single or number of Contracting Parties.</p> <p>Canada Within the purview of Canada, the Federal Courts Act 1985, provides a transparent mechanism to challenge decisions of administrative bodies or tribunals and receive a hearing before a justice of the court.</p> <p>The system has been tested and proven to be effective on several occasions, for example, in 1990 at the Supreme Court of Canada (SCC), "The Sparrow Decision" resolved that aboriginal groups have a right to fish for food, societal and ceremonial purposes and that this use-right is surpassed only by conservation of the resource.</p> <p>Therefore, the management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery, thereby meeting the SG 80. The SG 100 is not achieved as ICCAT has yet to adopt a more formal system for dispute settlement.</p>		
c	Guidepost	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	Y	Y	Y
	Justification	<p>ICCAT ICCAT includes a specific Recommendation on, "Criteria for Allocation of Fishing Possibilities", i.e. quota allocations (ICCAT, 2001). Among these criteria, the interests of artisanal, subsistence, small-scale coastal fishers, coastal fishing communities, coastal states and regions dependent on fishing, as well as the right to fish on the high seas are recognised.</p> <p>Canada The Constitution Act 1982 (Government of Canada 1982) recognizes and confirms aboriginal and treaty rights of the aboriginal peoples of Canada, including the guarantee of legal rights to fish for food and livelihood. This section has been litigated and confirmed by the Supreme Court on several occasions and constitutes a formal commitment to the rights of aboriginal peoples. Disputes regarding aboriginal fishing rights have been fairly resolved (R.v Sparrow, R.v Marshall) (Supreme Court of Canada 1985) and have led to current policy initiatives that ensures the protection of aboriginal rights, namely the "Aboriginal Fisheries Strategy" (DFO 1992) which is aimed at ensuring that aboriginal entitlements are respected in the development of fisheries management regimes for aboriginal peoples.</p> <p>Since 2000 the DFO has facilitated a transfer process to provide First Nations with Swordfish licenses. As a result of this process there have been 9 licence transfers to Aboriginal groups – with no transfers since 2004. All communal commercial fisheries licences are held in the name of the First Nation Group</p>		

PI 3.1.1	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none">• Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and• Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and• Incorporates an appropriate dispute resolution framework.	
	<p>(DFO 2013).</p> <p>Therefore, the management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2, meeting SG 100.</p>	
References	<p>Atlantic Fishery Regulations (1985) http://laws-lois.justice.gc.ca/eng/regulations/sor-86-21/index.html</p> <p>DFO (1992) The Aboriginal Fisheries Strategy http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/afs-srapa-eng.htm</p> <p>DFO (2013) Integrated Fisheries Management Plans (IFMPs) for swordfish and other tuna species (albacore, bigeye and yellowfin tuna) http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/swordfish-espadon/NEW-swordfish-2013-espadon-eng.htm</p> <p>FAO Code of Conduct for Responsible Fisheries (1995) http://www.fao.org/docrep/005/v9878e/v9878e00.HTM</p> <p>Fisheries Act (1985) http://laws-lois.justice.gc.ca/PDF/F-14.pdf</p> <p>Fishery (General) Regulations (1993) http://laws-lois.justice.gc.ca/PDF/SOR-93-53.pdf</p> <p>ICCAT (2007) The International Convention for the Conservation of Atlantic Tunas (as amended) http://www.iccat.int/Documents/Commission/BasicTexts.pdf</p> <p>ICCAT 2001, 01-25 ICCAT Criteria for the Allocation of Fishing Possibilities http://iccat.int/Documents/Recs/compendiopdf-e/2001-25-e.pdf</p> <p>ICCAT Contracting Parties http://www.iccat.es/en/contracting.htm.</p> <p>ICCAT Manual https://www.iccat.int/Documents/SCRS/Manual/CH1/CH1-ENG.pdf</p> <p>Northwest Atlantic Fisheries Organization (NAFO) https://www.nafo.int</p> <p>Oceans Act (1996) http://laws-lois.justice.gc.ca/PDF/O-2.4.pdf</p> <p>Sparrow Decision https://scc-csc.lexum.com/scc-csc/scc-csc/en/item/609/index.do</p> <p>Species at Risk Act (2002) http://laws-lois.justice.gc.ca/PDF/S-15.3.pdf</p> <p>Spencer et al (2016) http://www.iccat.es/Documents/Other/0-2nd_PERFORMANCE_REVIEW_TRI.pdf</p> <p>The Federal Courts Act (1985) http://laws-lois.justice.gc.ca/eng/acts/F-7/</p> <p>United Nations Convention on the Law of the Sea (UNCLOS) (1982) http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf</p> <p>United Nations Fisheries Agreement (UNFA) (1995) http://www.un.org/depts/los/convention_agreements/convention_overview_fish_stocks.htm</p>	
OVERALL PERFORMANCE INDICATOR SCORE: SI a: 80; SI b: 80; SI c: 100.		85
CONDITION NUMBER:		N/A

Evaluation Table for PI 3.1.2

PI 3.1.2		<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
	Met?	Y	Y	Y
	Justification	<p>ICCAT The ICCAT Convention and basic texts include defined roles and responsibilities of the Commission, of the Secretariat and the Contracting Parties. The ICCAT Manual provides an organogram and explicitly describes the functions, roles and responsibilities of the various ICCAT bodies (replicated in section 3.7.3 of this report). ICCAT meetings are advertised and open to the public providing an opportunity for all interested and affected parties to be involved.</p> <p>Canada Canada has established two main bodies for consulting with industry and other stakeholders on positions at ICCAT and the domestic management measures of the Canadian longline swordfish fishery:</p> <p>The Atlantic Large Pelagic Advisory Committee (ALPAC) is the main body for both industry and the DFO to work collaboratively on the management of large pelagic species (swordfish, albacore, bigeye, yellowfin, blue fin and sharks) in Atlantic Canada. The Committee's membership, roles and responsibilities are set out in a terms of reference (DFO 2002). The Committee is chaired by DFO and, aside from the representation of most divisions of DFO, membership of the ALPAC group is made up of industry stakeholders that include: fish harvesters; processors; representatives from each of the Atlantic provincial governments and Quebec. Observers may take part in the discussions if invited to by the Chair (DFO 2002). As indicated in minutes of the meeting (DFO 2016a) ENGOs actively participate in the meetings.</p> <p>The ALPAC terms of reference confirm there will be at least one meeting a year and the IFMP (DFO 2013) indicates the committee normally meets at least twice a year: in the spring, when the committee reviews the fisheries from the previous year and discuss any issues/concerns and recommendations for the domestic management of the fisheries; and, in the autumn, discussions take place on the position the Canadian delegation will adopt at the annual meeting at ICCAT.</p> <p>No formal voting procedures are established. The committee seeks to operate on a consensus basis.</p> <p>ALPAC may also establish ad hoc sub-committees and/or working groups to assess specific policy options and management measures.</p> <p>An "Ecosystem Working Group" was initiated in the spring of 2010 to provide advice to ALPAC and DFO with respect to the implementation of an Ecosystem Approach to Management (EAM) in the various large pelagic fisheries in Atlantic</p>		

PI 3.1.2		<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>		
		<p>Canada. Both of the swordfish fleets, pelagic longline and harpoon, are represented on the working group (DFO 2013).</p> <p>The Scotia Fundy Large Pelagics Advisory Committee (SFLPAC) is described by DFO as “the second tier” government-industry consultative group (DFO 2013) that meets at least once a year to discuss fisheries issues and provide input and advice to DFO on the management and use of the Canadian Atlantic east coast tuna, swordfish and shark fisheries resources. The Committee’s membership, roles and responsibilities are set out in a terms of reference (DFO 2014). The Committee is chaired by DFO and membership includes representatives from Scotia-Fundy based groups, i.e. licence holders for all relevant gear sectors, aboriginal groups, processors, Nova Scotia and New Brunswick provincial governments, regional ENGOs (DFO 2014).</p> <p>The Committee provides recommendations and advice on Maritimes (Scotia-Fundy) regional policy issues related to the large pelagic fisheries as well as annual fishing plans, regulatory measures, fishing seasons, licensing policies, size limitations, by-catch provisions, gear restrictions and other aspects of the Integrated Fisheries Management Plans (IFMPs) that may arise. Ad hoc sub-committees / working groups can be established to review specific policy and management issues. Separate working groups for tunas, swordfish and shark have been established. No formal voting procedures are established. The committee seeks to operate on a consensus basis and when consensus is not possible, the majority opinion is noted as well as outstanding objections (DFO 2014).</p> <p>DFO Maritimes Region and a group of regional and national Environmental Non Governmental Organisations (ENGOs) have established a “Dialogue Forum” that meets on a regular basis to help inform those stakeholders of upcoming items of interest related to Fisheries and Oceans management. The forum operates under an agreed terms of reference (DFO 2011).</p> <p>Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction, thereby meeting the SG 100.</p>		
b	Guidepost	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
	Met?	Y	Y	N
	Justification	<p>ICCAT ICCAT meetings provide the consultative mechanism for Contracting Parties to share information concerning management of fisheries. The process allows for annual national reports, including local knowledge, to be reviewed and included in Commission meetings.</p> <p>Each year, scientists from the Contracting Parties are invited to present their latest results to the pertinent ICCAT Species Groups and to the SCRS.</p>		

PI 3.1.2		<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>		
		<p>Advances made by groups or individual investigators are adopted as the most up-to-date information and become part of the knowledge base used in stock assessments. The assessment team consider this a consultative process and the SCRS a forum through which the management system demonstrates consideration of the information obtained.</p> <p>Canada National, regional and fishery specific consultations take place within the domestic management system.</p> <p>Consultation on national policy and legislative issues are advertised on the DFO website http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/comm/consultation-eng.htm.</p> <p>Regional consultations are also posted on DFO regional websites, e.g. http://www.inter.dfo-mpo.gc.ca/Maritimes/Oceans/Species-at-Risk/Public-Consultations.</p> <p>DFO also demonstrates through their website the input and consideration of local knowledge and information obtained from consultations, e.g. the following link presents information that was provided to DFO following the consultation on three potential Areas of Interest (Aol) (the initial administrative steps in developing marine protected areas) off the Nova Scotia coast http://www.inter.dfo-mpo.gc.ca/Maritimes/Oceans/OCMD/Marine-Protection/What-We-Heard.</p> <p>With respect to fishery specific consultation processes, the terms of reference of ALPAC and SFLPAC (DFO 2002 & 2014) and the supporting minutes of meetings, clearly demonstrates the management of the fishery includes consultation processes that regularly seek and accept relevant information, including local knowledge.</p> <p>As a result the management system is considered to include consultation processes that regularly seek and accept relevant information, including local knowledge, and demonstrate consideration of the information obtained. The SG 80 requirements are therefore met. The SG 100 is not met as there was no evidence to show that the management system demonstrates how information is used or not used.</p>		
c	Guidepost		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?		Y	Y
	Justification	<p>ICCAT ICCAT meetings are advertised and open to the public providing an opportunity for all interested and affected parties to be involved, including in the Scientific process.</p> <p>The ICCAT Convention (Article XI) states that the Commission may invite any appropriate international organization and any non-member Government that is a member of the UN or of any Specialized Agency to send observers to meetings of the Commission and its subsidiary bodies.</p> <p>While there is no explicit provision made in the ICCAT Convention for the participation of NGOs in meetings they are explicitly mentioned and taken into</p>		

PI 3.1.2		<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>
		<p>account within, “Guidelines and Criteria for Granting Observer Status at ICCAT Meetings” (ICCAT 2005). All NGOs which support the objectives of ICCAT and with a demonstrated interest in the species under the purview of ICCAT are eligible to participate as an observer in all but extraordinary meetings held in executive sessions or meetings of Heads of Delegations. Application has to be made through the Secretariat at least 50 days in advance of the meeting. CPCs are notified and given opportunity to object. Applications are accepted unless one-third of the CPCs object.</p> <p>Observers are not allowed to vote, but they can, upon invitation by the chair, make an oral statement during the meeting and distribute documents at meetings through the Secretariat. Observers may be required to pay a fee to contribute to additional expenses generated by their participation.</p> <p>Canada Through DFO national and regional websites, consultation are widely available and are considered to provide opportunity and encouragement for all interested and affected parties to be involved. Evidence through feedback provided on, “what we heard” links, indicates effective engagement, e.g. http://www.inter.dfo-mpo.gc.ca/Maritimes/Oceans/OCMD/Marine-Protection/What-We-Heard,.</p> <p>Minutes of the ALPAC and SFLPAC (DFO 2016a & 2016b) provide evidence that the fishery specific consultation process provides opportunity and encouragement for all interested and affected parties, and facilitates their effective engagement.</p> <p>The consultation process is therefore considered to provide opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement, meeting SG 100.</p>
References		<p>DFO (2002) ALPAC Terms of Reference</p> <p>DFO (2011) Terms of Reference Maritimes Region DFO – Marine ENGO Forum</p> <p>DFO (2013) Integrated Fisheries Management Plans (IFMPs) for swordfish and other tuna species (albacore, bigeye and yellowfin tuna) http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/swordfish-espado/NEW-swordfish-2013-espado-eng.htm</p> <p>DFO (2014) SFLPAC Terms of Reference</p> <p>DFO (2016a) ALPAC Minutes</p> <p>DFO (2016b) SFLPAC Minutes</p> <p>ICCAT Manual https://www.iccat.int/Documents/SCRS/Manual/CH1/CH1-ENG.pdf</p> <p>ICCAT (2005) Guidelines and criteria for granting observer status at ICCAT meetings 05-12. https://www.iccat.int/Documents/Recs/compendiopdf-e/2005-12-e.pdf</p> <p>ICCAT (2007) The International Convention for the Conservation of Atlantic Tunas (as amended) http://www.iccat.int/Documents/Commission/BasicTexts.pdf</p>
OVERALL PERFORMANCE INDICATOR SCORE: SI a: 100; SI b: 80; SI c: 100		90
CONDITION NUMBER:		N/A

Evaluation Table for PI 3.1.3

NB This PI was included in the harmonisation meeting convened by MSC and referred to in section 4.1 of this report. The text reflects the agreed outcome of this meeting and includes an update following the publication of an independent performance review of ICCAT.

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Long-term objectives to guide decision-making, consistent with the MSC Principles and Criteria and the precautionary approach, are implicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy.
	Met?	Y	Y	N
	Justification	<p>ICCAT</p> <p>The long term objective set out in Article VIII of the ICCAT Convention is to maintain the populations of tuna and tuna-like fishes that may be taken in the Convention area at levels which will permit the maximum sustainable catch. There is no mention of the precautionary approach in the Convention because it predates the concept of the precautionary approach which was introduced in fisheries in the 1990s. However, there are ICCAT Recommendations and Resolutions that explicitly mention the precautionary approach.</p> <p>ICCAT Recommendation 11-13 sets out a series of principles, based on stock status as represented by the Kobe Plot. This format of presenting stock assessment results facilitates the application of the precautionary approach by providing the basis to evaluate and adopt management options at various levels of success. This applies to both Principle 1 species (i.e. swordfish) and Principle 2 species (i.e. other tunas, marlins, and sharks), even when information is limited (ICCAT 2013a).</p> <p>At its 2015 meeting, ICCAT adopted two resolutions that state that when making recommendations pursuant to Article VIII of the Convention, the Commission should:(a) apply a precautionary approach, in accordance with relevant international standards (Resolution 2015-12) (ICCAT, 2015c); and, (b) apply an ecosystem-based approach to fisheries management (Resolution 2015-11) (ICCAT, 2015b). The formulation of these resolutions is consistent with the UN Fish Stock Agreement and the FAO Code of Conduct for Responsible Fisheries.</p> <p>Of the two main types of instruments used by ICCAT in implementing management policy (recommendations and resolutions), recommendations are binding on ICCAT Contracting Parties under the terms of Article VIII, however, resolutions are non-binding. In their respective preambles, Resolutions 2015-11 and 2015-12 make reference to the discussions taking place within the ICCAT Convention Amendment Working Group on the incorporation of a precautionary approach and an ecosystem approach to fisheries management and in the proposed amendments to the ICCAT Convention. These resolutions can be regarded as an interim step pending the outcome of the Convention Amendment Working Group. Pending that outcome, the precautionary approach is not yet required by management policy within ICCAT.</p> <p>Since the MSC harmonization meeting (section 4.1 above) a performance review report of ICCAT (Spencer et al 2016) has been published. It concludes that ICCAT has been inconsistent in applying the precautionary approach, has not generally applied the precautionary approach where scientific information is</p>		

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach
	<p>uncertain, unreliable or inadequate. The review recommends that Resolution 15-12 is transformed into a Recommendation and that the new Convention contains an explicit commitment to apply the precautionary approach.</p> <p>Canada</p> <p>Fish stock conservation and other ecosystem sustainability objectives stem from Canadian legislation such as: the Fisheries Act, Ocean's Act and Species at Risk Acts, and policy initiatives such as: the Atlantic Fisheries Policy Review and Sustainable Fisheries Framework.</p> <p>The Atlantic Fisheries Policy Review provides objectives to guide decision-making in Atlantic fisheries. It places conservation of the resource as the priority, sets the path for greater industry self-reliance, establishes transparent rules-based processes for decision-making and encourages a greater role for resource users and others (DFO 2004).</p> <p>The precautionary and ecosystem approaches are required to be incorporated into all fishery management decisions while protecting biodiversity and fisheries habitat by virtue of the "Sustainable Fisheries Framework" (DFO 2009a).</p> <p>The "Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas" requires the mitigation of the impacts of fishing on sensitive benthic areas or avoidance of impacts of fishing that are likely to cause serious or irreversible harm to sensitive marine habitat, communities and species (DFO 2009b).</p> <p>Requirements and procedures for new fisheries are outlined in "The Emerging Species Policy". A cornerstone of the policy is the establishment of a scientific base with which stock responses to new fishing pressures can be assessed (DFO 2008).</p> <p>These broad policy guidelines are implemented through fisheries specific objectives that are outlined in fisheries management plans.</p> <p>Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach are explicit within management policy, thereby meeting the SG 80. Because the precautionary approach is not yet required by management policy within ICCAT the SG 100 is not met.</p>
References	<p>DFO (2004) Atlantic Fisheries Policy Review http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/afpr-rppa/framework-cadre-eng.htm</p> <p>DFO (2008) The Emerging Species Policy http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/efp-pnp-eng.htm</p> <p>DFO (2009a) Sustainable Fisheries Framework http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm</p> <p>DFO (2009b) Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-back-fiche-eng.htm</p> <p>DFO (2013) Integrated Fisheries Management Plans (IFMPs) for swordfish and other tuna species (albacore, bigeye and yellowfin tuna) http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/swordfish-espado/NEW-swordfish-2013-espado-eng.htm</p> <p>FAO Code of Conduct for Responsible Fisheries (1995) http://www.fao.org/docrep/005/v9878e/v9878e00.HTM</p> <p>ICCAT (2011b) Recommendation by ICCAT on the Principles of decision making for ICCAT Conservation and Management Measures, Rec 11-13. http://www.iccat.int/Documents/Recs/compendiopdf-e/2011-13-e.pdf</p> <p>ICCAT (2013a) North Atlantic Swordfish Stock Assessment Presentation https://www.iccat.int/Documents/SCRS/Presentation/2013/Panel4-2013.pdf.</p>

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach	
	<p>ICCAT (2015b) Resolution 15-11 by ICCAT concerning the application of an ecosystem approach to fisheries management. https://www.iccat.int/Documents/Recs/compendiopdf-e/2015-11-e.pdf</p> <p>ICCAT 2015c) 15-12 Resolution by ICCAT concerning the use of a precautionary approach in implementing ICCAT conservation and management measures. https://www.iccat.int/Documents/Recs/compendiopdf-e/2015-12-e.pdf</p> <p>Spencer et al 2016 http://www.iccat.es/Documents/Other/0-2nd_PERFORMANCE_REVIEW_TRI.pdf</p> <p>The International Convention for the Conservation of Atlantic Tunas, Article VIII, http://www.iccat.int/Documents/Commission/BasicTexts.pdf</p> <p>United Nations Fisheries Agreement (UNFA) (1995) http://www.un.org/depts/los/convention_agreements/convention_overview_fish_stocks.htm</p>	
OVERALL PERFORMANCE INDICATOR SCORE: SI a: 80		80
CONDITION NUMBER:		N/A

Evaluation Table for PI 3.1.4

PI 3.1.4		The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices.
	Met?	Y	Y	N
	Justification	<p>ICCAT</p> <p>ICCAT's Conservation and Management Measures Compliance Committee annually reviews member country's adherence with ICCAT recommendations (ICCAT Manual). Such reviews may be viewed as providing a positive incentive for sustainable fishing, particularly since management plans usually call for quota overshoots to be repaid (deducted from future quotas). However, Spencer et al (2016) reports that the ineffectiveness of the Compliance Committee in holding Contracting Parties accountable can undermine the incentive value of the Committee.</p> <p>No evidence was found to indicate that ICCAT provides any subsidies that contribute to unsustainable fishing.</p> <p>Canada</p> <p>The ITQ system implemented in the swordfish longline fleet provides a quasi-property right to the licence holder that may reduce the competitive drive among harvesters that can lead to unsustainable fishing habits. Under the ITQ system harvesters can better plan for the fishing season, as they know their quota and can plan for the most opportune time to harvest it (T. Atkinson, pers. comm., 2016).</p> <p>In addition to increased stability in the fishery the involvement of stakeholders in management may help to promote sustainable fishing practices. All stakeholders involved either directly or indirectly in the large pelagic fisheries have the opportunity to input into the management of the fishery through either SFLPAC and/or ALPAC. Being involved in management discussions and decisions can help to instill a sense of stewardship and ownership of the resource, leading to more sustainable habits to protect the resource.</p> <p>Individual license holders are bound by annual legal contracts (NSSA, 2016) to the NSSA to abide by the CHP. The contract clearly outlines all operational aspects for the fishery, including time/area closures, hailing protocols, observer coverage levels, quotas for both the fleet and the individual harvester, quota transfer processes, and penalties for exceeding individual quotas.</p> <p>There are no direct financial incentives, e.g., price or fuel subsidies, in the fishery.</p> <p>Therefore, it is considered that the management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1</p>		

PI 3.1.4	The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing
	and 2, and seeks to ensure that perverse incentives do not arise. The fishery therefore meets SG 80. As it is not evident that the management system explicitly considers incentives in a regular review of management policy or procedures to ensure that they do not contribute to unsustainable fishing practices, the requirements of SG 100 are not met.
References	<p>ICCAT Manual https://www.iccat.int/Documents/SCRS/Manual/CH1/CH1-ENG.pdf</p> <p>DFO (2013) Integrated Fisheries Management Plans (IFMPs) for swordfish and other tuna species (albacore, bigeye and yellowfin tuna) http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/swordfish-espardon/NEW-swordfish-2013-espado-eng.htm</p> <p>NSSA (2016) NSSA Members Legal Agreement in Relation to the Swordfish longline fishery.</p> <p>Spencer et al 2016 http://www.iccat.es/Documents/Other/0-2nd_PERFORMANCE_REVIEW_TRI.pdf</p>
OVERALL PERFORMANCE INDICATOR SCORE: SI a: 80	
CONDITION NUMBER:	
80	
N/A	

Evaluation Table for PI 3.2.1

The “Fishery-specific management system” component of Principle 3 (the PIs pre-fixed with 3.2) focuses on the management system directly applied to the fishery. In this instance, there are two aspects of the management that need to be taken into account – the international (ICCAT) and the domestic (Canada).

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC’s Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are implicit within the fishery’s management system	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are explicit within the fishery’s management system.	Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are explicit within the fishery’s management system.
	Met?	Y	Y	N
	Justification	<p>ICCAT</p> <p>The overarching objective of ICCAT is to maintain catches of species in their purview at maximum sustainable levels (ICCAT 2007). Management actions are taken by ICCAT to either recover stocks to the level that provides these catches, or to maintain stocks at that level. In 1999, ICCAT set an objective to rebuild the North Atlantic swordfish stock within 10 years to the biomass that would produce MSY with a greater than 50 % probability. With Contracting Parties commitment, including agreement on a reduced TAC and country specific allocations, this was achieved ahead of schedule, showing that it was both well-defined and measureable.</p> <p>Canada</p> <p>Stock conservation and other sustainability objectives for the longline swordfish fishery stem from Canadian legislative and evolving policy developments such as the Ocean's and Species at Risk Acts, the Atlantic Fisheries Policy Review, the Aboriginal Fisheries Strategy and Sustainable Fisheries Framework. The IFMP reflects the policy objectives set out in these documents with five overarching objectives for managing the Canadian swordfish fishery:</p> <p><i>Conservation objectives</i></p> <ol style="list-style-type: none"> 1. Productivity: Do not cause unacceptable reduction in productivity so that components can play their role in the functioning of the ecosystem. 2. Biodiversity: Do not cause unacceptable reduction in biodiversity in order to preserve the structure and natural resilience of the ecosystem. 3. Habitat: Do not cause unacceptable modification to habitat in order to safeguard both physical and chemical properties of the ecosystem <p><i>Social, cultural and economic objectives</i></p> <ol style="list-style-type: none"> 4. Culture and Sustenance: Respect Aboriginal and treaty rights to fish. 5. Prosperity: Create the circumstances for economically prosperous fisheries. <p>From the above, it is concluded that short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are explicit within the fishery’s management system. The fishery does not meet</p>		

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2
		SG 100 as it cannot be said that the IFMP objectives are operationally defined in a way that the performance against the objective can be measured.
References		<p>DFO (2013) Integrated Fisheries Management Plans (IFMPs) for swordfish and other tuna species (albacore, bigeye and yellowfin tuna) http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/swordfish-espado/NEW-swordfish-2013-espado-eng.htm</p> <p>DFO (2004) Atlantic Fisheries Policy Review http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/afpr-rppa/framework-cadre-eng.htm</p> <p>DFO (2009a) Sustainable Fisheries Framework http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm</p> <p>DFO (1992) The Aboriginal Fisheries Strategy http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/afs-srapa-eng.htm</p> <p>ICCAT (1999) Recommendation 99-2 Rebuilding program North Atlantic swordfish https://www.iccat.int/Documents/Recs/compendiopdf-e/1999-02-e.pdf</p> <p>ICCAT (2007) The International Convention for the Conservation of Atlantic Tunas (as amended) http://www.iccat.int/Documents/Commission/BasicTexts.pdf</p> <p>Oceans Act (1996) http://laws-lois.justice.gc.ca/PDF/O-2.4.pdf</p> <p>Species at Risk Act (2002) http://laws-lois.justice.gc.ca/PDF/S-15.3.pdf</p>
OVERALL PERFORMANCE INDICATOR SCORE: SI a: 80		80
CONDITION NUMBER (if relevant):		N/A

Evaluation Table for PI 3.2.2

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Y	Y	
	Justification	<p>ICCAT</p> <p>Article III of the ICCAT Convention requires decisions of the Commission to be taken by a majority of the Contracting Parties, each Contracting Party having one vote. Two thirds of the Contracting Parties constitute a quorum. In practice, however, ICCAT has traditionally used consensus decision-making.</p> <p>The Commission receives advice from its Committees, e.g. scientific advice on issues such as stock status and catch limits comes from the SCRS. The Commission meets annually to review this advice and to develop, decide and implement conservation and management measures as well as policy changes. ICCAT's principle objective is to maintain fish stocks under their purview at levels that will permit the maximum sustainable catch for food and other purposes. Since its establishment, ICCAT has implemented a wide range of tools for the conservation and management of stocks, including TAC and catch quotas (Member allocations), size limits, effort restrictions, observer programs, closed areas and seasons, vessel registration and information exchange, gear restrictions, and enforcement measures.</p> <p>Specifically with respect to swordfish, in 1999, ICCAT set an objective of rebuilding the North Atlantic swordfish stock within 10 years, to the biomass that would produce MSY with a greater than 50 % probability (ICCAT, 1999). With Contracting Parties commitment, including agreement on a reduced TAC and country specific allocations, this was achieved.</p> <p>On two separate occasions, an external review of the performance of ICCAT (Hurry et al, 2009 and Spencer et al, 2016), has specifically reviewed the decision making process. Hurry et al, 2009, noted the fundamental processes for decision making within ICCAT are sound, provided the processes are followed and the advice from Committees is generally followed. However, social and economic issues have tended to prevent taking hard decisions at an early point in time and subsequently the Commission has found itself having to make tougher decisions to implement catch restrictions and recovery plans, the Atlantic and Mediterranean bluefin tuna fisheries were cited as examples.</p> <p>Spencer et al, 2016, noted the increased number of Contracting Parties makes consensus more difficult and the approach has often led to either the postponement of decisions, the change in proposals from a legally binding recommendation to a non-legally binding resolution, or continued deferral of decision-making on the adoption of measures.</p> <p>Canada</p> <p>The IFMP (DFO, 2013) sets out the decision-making process:</p> <ul style="list-style-type: none"> a) ICCAT sets quota and international management requirements; b) Advisory Committee involvement: <ul style="list-style-type: none"> i. SFLPAC – discusses management measures and objectives based 		

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.			
		<p>on Canadian perspective. Depending on the nature of the issues (regional or inter-regional) recommendations are made either directly to the Maritimes Regional Director General (RDG) or to ALPAC.</p> <p>ii. ALPAC – based on ICCAT and SFLPAC discussions, this group makes recommendations to meet both the international obligations and domestic (Canadian swordfish IFMP).</p> <p>c) Recommendation submission: A memo is prepared by Resource Management (Regions or DFO-Ottawa) to provide Advisory Committee discussions and recommended measures to sustainably manage the swordfish and other tuna fisheries.</p> <p>d) Approvals: The Minister of Fisheries and Oceans delegates the authority for some approvals to national or regional staff but continues to retain final authority for fisheries management.</p> <p>DFO also convene meetings as part of the Regional Advisory Process (RAP) to review science and provide advice and recommendations to management. This is an open process with peer review and stakeholder engagement. RAPs have been held in relation to monitoring the incidental catch in the swordfish and tuna fisheries. The proceedings, participants and reports from the RAP are published on the DFO website (http://www.dfo-mpo.gc.ca/Library/344509.pdf).</p> <p>As a result of recommendations from the advisory committees and science advice from the RAPs, DFO makes the final decision on management measures and strategies. The IFMP includes a section, “Strategies and Tactics” that explicitly describes the measures that DFO have adopted and how they are implemented with the intent of achieving the fishery specific objectives.</p> <p>As a result, the SG 80 is achieved, as there are established decision-making processes that result in measures and strategies to achieve the fishery specific objectives.</p> <p>It is noted that owing to a failure to keep the IFMP updated on an annual basis, some of the information in the “Strategies and Tactics” and other sections, is out of date. It is therefore recommended that the IFMP is updated annually and, in so doing a record of amendment is maintained in order to show changes. This is non-binding Recommendation #5.</p>		
b	Guidepost	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Y	Y	N
	Justification	<p>ICCAT</p> <p>Article VIII of the ICCAT Basic Texts establish the process of decision-making (ICCAT, 2007). Decisions must be based on scientific evidence.</p> <p>ICCAT scientists meet in the SCRS and its working groups to evaluate the status of the stocks and develop responses to questions on science as requested by the Commission. The ICCAT fishery managers meet in species Panels to discuss the</p>		

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.
	<p>SCRS advice and to prepare management measures (Panel 4 provides management consultation for swordfish). The Commission meets to approve the recommendations of the Panels. This process provides opportunity for decision-making in response to serious issues and discussion is conducted within the wider mandate of ICCAT.</p> <p>Both Independent Performance Reviews of ICCAT (Hurry et al 2008, Spencer et al 2016) have highlighted that, despite the Convention allowing for decisions to be based on a majority vote, the consensus decision-making process that has been adopted within ICCAT has not always been able to ensure the adoption of conservation and management measures “in a timely manner”.</p> <p>The most recent review (Spencer et al 2016), highlighted feedback the review panel received from two Contracting Parties regarding transparency in decision-making. These parties indicated a perceived lack of transparency on the allocation of fishing opportunities related to tuna species. As a result of this feedback, the review panel included within their recommendations, that ICCAT reviews its working practices in order to enhance transparency.</p> <p>The report also suggests that achieving consensus is becoming more difficult due to increasing membership. These comments were made mostly with regards to Atlantic bluefin tuna, more particularly for the East Atlantic and Mediterranean area. However, the report indicates that since 2008, and the first independent review of ICCAT, additional conservation and management measures have been adopted in more timely and effective manner (Spencer et al 2016).</p> <p>Canada</p> <p>The fishery specific decision-making process is set out in the IFMP (DFO, 2013) and described in SI (a) above.</p> <p>The decision-making process is carried out in an open and transparent manner, taking account of the wider implications, through both public and industry consultations, i.e. SFLPAC, ALPAC and and/or their sub-committees and through the RAP. Recommendations and advice from the two advisory committees and any related RAP are taken into account by DFO when making fishery specific management decisions.</p> <p>Examples of outcomes from the decision-making process include:</p> <p>The annual drafting and agreement of the swordfish CHP - The swordfish CHP is consulted/discussed at the SFLPAC and ALPAC meetings. Preparation of the draft plan is undertaken by the NSSA. A draft CHP, which includes the quota allocations and the operational requirements, i.e. primarily the licence conditions, is then submitted to DFO in the Maritimes region (DFO, 2016c) for their review and approval.</p> <p>Turtle research - The initiation by DFO of a post release survival study and associated work on loggerhead sea turtles, with the aim of reducing incidental capture and enhance survival after release. It is noted that this research is behind target, however, this appears to be a result of technical issues with respect to the field work and also the limited encounters vessels carrying tagging equipment have had with loggerhead sea turtles (DFO, 2016e).</p> <p>Bycatch mitigation measures - The development and subsequent requirement for compulsory training on dehooking and disentangling turtles and the mandatory use of circle hooks (DFO 2016d, NSSA, 2016).</p> <p>Therefore, the decision-making processes are considered to respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions, thereby meeting the SG 80. The SG 100 is not met as it cannot be said that decision-making processes respond to <u>all</u> issues</p>

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
		identified in relevant research, monitoring, evaluation and consultation.		
c	Guidepost		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		N	
	Justification	<p>ICCAT</p> <p>ICCAT's decisions are based on the best available scientific information. The Precautionary approach is also implicit in the scientific process. As indicated above in PI 3.1.3, ICCAT formally adopted the precautionary approach at its 2015 meeting. In addition, the rebuilding of the Atlantic swordfish stock adopted a precautionary approach in setting TACs, resulting in the stock rebounding within the planned recovery period.</p> <p>It is noted that Spencer et al, 2016 concludes that ICCAT has been inconsistent in applying the precautionary approach, particularly where scientific information is uncertain, unreliable or inadequate. This is not considered to be the case for North Atlantic swordfish.</p> <p>Canada</p> <p>The precautionary approach is required for all fisheries as a matter of policy as outlined in the "Sustainable Fisheries Framework" (DFO 2009a). The IFMP (DFO, 2013) includes a section on the precautionary approach and how it is adopted in fisheries management within Canada. The focus of the approach is on fisheries resources, i.e. swordfish, tuna and shark species, and is based on best available information.</p> <p>How the precautionary approach is used in decision-making processes for non-commercial species is not explicit within the management plan or any other document that the assessment team had access to. Given the fisheries interaction with turtle species, the lack of an explicit rationale for how the precautionary approach is, or is not necessarily, being used with respect to this issue means the SG 80 is not met.</p>		
d	Guidepost	Some information on fishery performance and management action is generally available on request to stakeholders.	Information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	Y	Y	N

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
	Justification	<p>ICCAT</p> <p>The ICCAT website provides comprehensive access to the various documents produced by the component bodies within ICCAT, e.g. Working groups, SCRS, Species Panels, the Commission. Minutes of meetings and the preamble to, ICCAT Recommendations generally provide the reason why a management measure is necessary, describe the mandate within which ICCAT is acting and highlights the research or other information that provides reasons for why action is or is not being taken, e.g. ICCAT 2016a.</p> <p>ICCAT also reports the decisions taken by the Commission in its biennial report, which is also posted on the ICCAT website https://www.iccat.int/en/pubs_biennial.htm.</p> <p>The ICCAT Secretariat is accessible to stakeholders and is able to support and direct enquiries to relevant ICCAT documentation.</p> <p>Canada</p> <p>The ALPAC and SFLPAC meetings are where details of the past season’s fishery are presented and reviewed; any issues identified; scientific advice received; management proposals made; and, consensus sought on management measures for the following fishing season. Representatives of organisations directly involved in the fishery as well as representatives from interested organisations (ENGOS) are participants at these meetings. Minutes of the meetings are provided to participants (DFO, 2014) or to non-participants upon request from DFO (M. Sweet, pers. comm., 2016). These include explanations for actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity, e.g. ALPAC draft minutes 2016, show response to questions related to Porbeagle shark harvest levels and action that DFO takes and the reason for lack of additional action (DFO, 2016a).</p> <p>Therefore, information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity, thereby meeting the SG 80.</p> <p>Evidence of providing comprehensive information on fishery performance of the Canadian fishery to all interested stakeholders was not available and so the SG 100 is not met.</p>		
e		Guidepost	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.
	Met?	Y	Y	Y

PI 3.2.2	<p>The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.</p>
Justification	<p>ICCAT</p> <p>No evidence of legal challenges against ICCAT were found in the course of the re-assessment.</p> <p>The various formal forums, i.e. the Commission, SCRS, Species Panels, working groups, etc., provide and encourage an opportunity for discussion and airing of any possible concerns. This is considered to reduce or mitigate the risk of legal challenge. In the case where disputes cannot be settled, the ICCAT Convention provides a process for Contracting Parties to object and withdraw from endorsing and implementing an ICCAT Recommendation (ICCAT Convention Article VIII).</p> <p>Canada</p> <p>There have been no legal challenges to the Canadian longline swordfish fishery (B. Lester, pers. comm. 2016)</p> <p>The advisory process and fora, i.e. ALPAC and SFLPAC, are considered to help mitigate disputes and legal challenges.</p> <p>Legal disputes within fisheries in Canada are adjudicated through the Canadian judicial process. The legal and policy framework has been tested on several occasions and shown to be effective in relation to fisheries related issues, "Larocque", "Sparrow" and "Marshall" decisions.</p> <p>Therefore, the management system is considered to proactively avoid legal disputes and implements judicial decisions arising from legal challenges, thereby meeting the SG 100.</p>
References	<p>DFO (2009a) Sustainable Fisheries Framework (2009) http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm</p> <p>DFO (2014) SFLPAC Terms of Reference</p> <p>DFO (2016a) ALPAC Minutes</p> <p>DFO (2016c) Draft Swordfish Conservation Harvesting Plan</p> <p>DFO (2016d) Draft Longline Swordfish Licence Conditions</p> <p>DFO (2016e) Progress Report: Loggerhead sea Turtle Post-Release Survival Study</p> <p>Hurry, G., Hayahi, M., Maguire, J.J., (2009) Report of the Independent Performance Review of ICCAT 2009. https://www.iccat.int/Documents/Other/PERFORM_%20REV_TRI_LINGUAL.pdf</p> <p>ICCAT (1999) Recommendation on Rebuilding Program for North Atlantic swordfish, Rec 99-2 https://www.iccat.int/Documents/Recs/compendiopdf-e/1999-02-e.pdf</p> <p>ICCAT (2007) The International Convention for the Conservation of Atlantic Tunas (as amended) http://www.iccat.int/Documents/Commission/BasicTexts.pdf</p> <p>ICCAT (2016a) Recommendation 16-03 by ICCAT for the Conservation of North Atlantic Swordfish. https://www.iccat.int/Documents/Recs/compendiopdf-e/2016-03-e.pdf</p> <p>ICCAT Manual https://www.iccat.int/Documents/SCRS/Manual/CH1/CH1-ENG.pdf</p> <p>Larocque Decision http://www.fishharvesterspecheurs.ca/system/files/products/Court-LarocqueDecisionSupremeCourt-Bilingual.pdf</p>

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.	
	<p>Marshall Decision https://www.aadnc-aandc.gc.ca/eng/1100100028614/1100100028615</p> <p>NSSA (2016) NSSA Members Legal Agreement in Relation to the Swordfish longline fishery.</p> <p>Sparrow Decision https://scc-csc.lexum.com/scc-csc/scc-csc/en/item/609/index.do</p> <p>Spencer, J., Maguire, J.J., Molenaar, E., (2016) Report of the Independent Performance Review of ICCAT. http://www.iccat.es/Documents/Other/0-2nd_PERFORMANCE_REVIEW_TRI.pdf</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		75
SI a: 80; SI b:80; SI c:60; SI d:80; SI e:100		
CONDITION NUMBER (if relevant):		1
RECOMMENDATION NUMBER		5

Evaluation Table for PI 3.2.3

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	Y	Y	Y
	Justification	<p>ICCAT</p> <p>The ICCAT Convention does not explicitly provide ICCAT with competence related to monitoring, control and surveillance (MCS) and so has no enforcement capacity. As with other RFMOs, ICCAT relies on its Contracting Parties to implement management measures, through appropriate harvest control tools.</p> <p>Canada</p> <p>DFO's Conservation and Protection Division (C&P) is the responsible body that supports conservation and sustainability of the swordfish and other tuna fisheries. Through the delivery of their surveillance, inspection and enforcement program C&P ensures compliance with measures in place to manage the fishery.</p> <p>Coastguard patrols are used to monitor boundary lines and closed areas, as well as provide a platform from which C&P Fishery Officers can conduct at sea boarding to inspect catch records, monitor fishing activity, assess species composition and check weights. Due to the large area covered by the fleet, at sea vessel monitoring (i.e. boardings) coverage is low, so aerial surveillance, satellite monitoring (Vessel Monitoring System - VMS) and at sea observers take on greater roles in the delivery of the C&P of the longline fleet (M. Comely, pers. comm., 2016)</p> <p>The scientific data related to catch and effort, and any biological sampling that is conducted at sea is used by the C&P Division to monitor compliance with respect to incidental catch and juvenile swordfish. Shore-based Fisheries Officers also work with dockside monitors to ensure the integrity of species identification and reported catch weights (M. Comely, pers. comm., 2016).</p> <p>Aerial surveillance is DFO's prime means of compliance with ICCAT Recommendations with respect to Illegal, Unlicensed, Unreported vessels (IUU) (ICCAT IUU vessel list - https://www.iccat.int/en/IUU.asp.)</p> <p>The IFMP has a section dedicated to compliance which includes a description of the compliance activities carried out in the swordfish fishery, i.e. a compliance strategy, examples of non-compliance, details of enforcement effort between 2005 and 2012, e.g. number of enforcement hours, patrol days, aerial surveillance hours, violations and a compliance index (violations per hour of enforcement), number and type of convictions. The IFMP states that it typically spends 1% of its annual enforcement effort on large pelagics, of which half is dedicated to swordfish and, given the relatively small number of active harvesters in the fishery, C&P considers this to probably be commensurate (IFMP 2013 and M. Comely, pers. comm., 2016)</p> <p>While the IFMP has not been updated since 2013, MSC annual audit teams have been provided with an update on enforcement activity and, at the 4th audit, C&P provided enforcement analysis for the period 2012 – 2015 which showed no</p>		

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
		<p>significant issues or systematic non-compliance. Most of the violations are administrative, e.g. failure to hail-in.</p> <p>An administrative and court-based sanction framework is outlined in the Fisheries Act and regulations with court based prosecution for serious offences through the Canadian Criminal Code (1985). Upon conviction maximum penalties of \$500,000 and up to two years in jail may be imposed along with forfeiture of catch and equipment at the discretion of the court.</p> <p>It is considered that a comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules. The SG 100 is therefore met.</p>		
b	Guidepost	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	Y	Y	Y
	Justification	<p>ICCAT</p> <p>ICCAT relies on its Contracting Parties to implement effective sanctions over their flagged vessels. ICCAT can impose trade sanctions and remove, suspend or reduce quota allocated to non-compliant Contracting Parties (ICCAT 2013c).</p> <p>Canada</p> <p>An administrative and court-based sanction framework is outlined in the Fisheries Act and regulations with court based prosecution for serious offences through the Canadian Criminal Code (1985). Upon conviction, maximum penalties of \$500,000 and up to two years in jail may be imposed along with forfeiture of catch and equipment at the discretion of the court.</p> <p>The IFMP (DFO, 2013) specifically refers to compliance issues and provides information on enforcement, compliance and penalties between 2005 and 2012. Within this period 14 convictions resulting in fines were reported: One fine in excess of \$5,000; four between \$1,000 – 5,000; and, nine < \$1,000. In terms of assessing deterrent value, the plan suggests that higher fines in other fisheries, e.g. lobster, may act as a deterrent. It also notes that the lack of an effective licence sanction regime (licence suspension) or absence of ticketing for low-end offences may detract from some of C&Ps enforcement effort.</p> <p>Annual MSC audits have reviewed enforcement and compliance (MSC, 2016) and no significant issues have been raised. DFO's C&P division confirmed at the 4th surveillance/re-assessment site visit that while there is no quantitative information on the effectiveness of enforcement (e.g., likelihood of violators being prosecuted and convicted) or the deterrent value of the sanction system, the sanctions were considered to be consistently applied. Furthermore, the low number of offences over the last 5 years, is thought to indicate an effective deterrent.</p> <p>The assessment team consider that sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence within the fishery, thereby meeting the SG 100.</p>		

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
c	Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Y	Y	N
	Justification	<p>ICCAT Not applicable</p> <p>Canada The low level of offences detected by C&P provides an indication that fishers generally comply with the management system. Other than C&P, no other stakeholders interviewed in the re-assessment site visit provided evidence of non-compliance in the Canadian fishery.</p> <p>Important information required to support the fishery is provided by the fishers, particularly through the completion of logbooks, which includes the quantity of fish caught and area of capture – all of which can be confirmed via dockside monitoring, VMS and observer reports. This information is used as part of Canada's annual submission to ICCAT.</p> <p>Therefore, there is evidence to demonstrate fishers comply with the management system, including the provision of information important for the effective management of the fishery, thereby meeting the SG 60 and 80. Owing to the lack of verifiable quantitative information for the entire fleet it is not possible to say there is a high degree of confidence that fishers comply with the management system and so the SG 100 is not achieved.</p>		
d	Guidepost		There is no evidence of systematic non-compliance.	
	Met?		Y	
	Justification	<p>ICATT There is no evidence of systematic non-compliance.</p> <p>Canada C&P have not reported any systematic non-compliance within the fishery and no other stakeholder provided information to suggest otherwise.</p> <p>The SG 80 is therefore met.</p>		
References		<p>DFO (2013) Integrated Fisheries Management Plans (IFMPs) for swordfish and other tuna species (albacore, bigeye and yellowfin tuna) http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/swordfish-espado/NEW-swordfish-2013-espado-eng.htm</p> <p>Canadian Criminal Code (1985) http://laws-lois.justice.gc.ca/eng/acts/C-46/</p>		

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with	
	ICCAT (2013c) Recommendation by ICCAT Concerning Trade Measures https://www.iccat.int/Documents/Recs/compendiopdf-e/2006-13-e.pdf MSC (2016) North West Atlantic Canada Longline Swordfish Annual Audit Reports https://fisheries.msc.org/en/fisheries/north-west-atlantic-canada-longline-swordfish/@@assessments	
OVERALL PERFORMANCE INDICATOR SCORE: SI a: 100; SI b: 100; SI c: 80; SI d: 80		90
CONDITION NUMBER (if relevant):		N/A

Evaluation Table for PI 3.2.4

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
	Met?	Y	Y	N

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
		<p>ICCAT</p> <p>ICCAT conducts periodic stock assessments of tunas and tuna like species through the SCRS, supported by the active participation from Contracting Parties. These assessments underpin the scientific advice for management that is provided to the Commission. The last assessment for Atlantic swordfish was conducted in 2013 (ICCAT 2013). The next is scheduled for 2017. Other stock assessments for bycatch species in the longline swordfish fishery are also undertaken by ICCAT, e.g. albacore, yellowfin, bigeye, blue shark, porbeagle, short fin mako.</p> <p>ICCAT also has a series of Special Research Programs listed on its web site (https://www.iccat.int/en/ResProgs.htm) that are used by ICCAT as a mechanism to help focus, coordinate and complement national research activities. The programs usually center on improving biological knowledge and fishery data for a particular species, and usually last a few years. In some cases they are funded by the Commission as part of the regular budget and in some cases they are funded by contributions from individual Contracting Parties and other agencies.</p> <p>Canada</p> <p>Canada contributes to the ICCAT scientific process through its own research and through participation of scientists at SCRS meetings.</p> <p>The IFMP does not include a research plan but does have a section on research, highlighting that the primary focus on the swordfish research programme has been the improvement in the quality of information (catch, catch-at-size and effort) in order to contribute to the ICCAT stock assessment. It also highlights collaborative work it undertook with US scientists on Pop-Up Satellite Archival Tag (PSAT) studies on swordfish looking at the seasonal distribution and migrations of the Northwest Atlantic swordfish, and, work DFO is undertaking to address the incidental catch of bluefin tuna, shortfin mako, porbeagle, blue and sharks, and leatherback and loggerhead sea turtles. Some of this research has been reported in previous annual audit reports.</p> <p>DFO have recently developed annual workplans for "Large Pelagics – Blue Fin and Swordfish" (DFO, 2017), "Shark and Dogfish" (DFO 2017a) and "Sea Turtles" (DFO, 2017b). These include research plans and explicitly describe how research, monitoring, data management and scientific advice link to the DFO decision making process.</p> <p>Research is clearly being undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2, thereby meeting the SG 60.</p> <p>The DFO workplans for large pelagics, sharks and turtles include annual research plans that are consistent with Principles 1 and 2 and provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2. Therefore, the SG 80 is met.</p> <p>The research plans are not considered to be comprehensive and so the SG 100 is not met.</p>		
b	Guidepost	Research results are available to interested parties.	Research results are disseminated to all interested parties in a timely fashion.	Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.
	Met?	Y	Y	N

PI 3.2.4		The fishery has a research plan that addresses the information needs of management	
	Justification	ICCAT Annual meetings and their outcomes, including research results, are posted on the ICCAT website in relatively quick time after the events by the ICCAT Secretariat and so available to all interested parties https://www.iccat.int/en/ .	
		Canada Research appears to be released as and when completed, although a common issue with DFO publications is a delay in publication owing to the need to translate into French. However, access to information appears to be relatively easy through contacting individuals within DFO or using the SFLPAC and ALPAC forums. It is noted that owing to the absence of a shark or large pelagic specialist publication of information and results has been slow to be published, however, DFO have recently filled this position and it is anticipated that this will help expedite the process. Therefore, research results are considered to be available to all interested parties in a timely fashion meeting the SG 80. In the absence of a research plan being available to all interested parties, the SG 100 is not met.	
References		DFO (2017) Large Pelagics – Blue Fin and Swordfish Work Plan 2017-2018. DFO Maritimes - Groundfish, Pelagics and Shrimp Section Population Ecology Division DFO (2017a) Shark and Dogfish Workplan 2017-2018. DFO Maritimes - Groundfish, Pelagics and Shrimp Section Population Ecology Division DFO (2017b) Sea Turtle Workplan 2017-2018. DFO Maritimes - Groundfish, Pelagics and Shrimp Section Population Ecology Division ICCAT (2013) Report of the 2013 Atlantic Swordfish Stock Assessment Session. Doc. No. SCI-036/2013 https://www.iccat.int/Documents/Meetings/Docs/2013_SWO_ASSESS_REP_ENG.pdf MSC (2016) North West Atlantic Canada Longline Swordfish Annual Audit Reports https://fisheries.msc.org/en/fisheries/north-west-atlantic-canada-longline-swordfish/@@assessments	
OVERALL PERFORMANCE INDICATOR SCORE: SI a:80; SI b:80			80
CONDITION NUMBER (if relevant):			

Evaluation Table for PI 3.2.5

PI 3.2.5		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The fishery has in place mechanisms to evaluate some parts of the management system.	The fishery has in place mechanisms to evaluate key parts of the management system	The fishery has in place mechanisms to evaluate all parts of the management system.
	Met?	Y	Y	N
	Justification	ICCAT ICCAT has mechanisms to evaluate and review all parts of the fishery specific management system through various committees, e.g. the SCRS evaluates scientific research, the CMMCC monitors and evaluates compliance with the Convention and ICCAT Recommendations. ICCAT also conducts periodic reviews of its own performance by using external and independent experts, e.g. Hurry et al 2008 and Spencer et al 2016. Canada Annual meetings of ALPAC and SFLPAC provide an opportunity to monitor, review and evaluate key parts of the management system. The ALPAC and SFLPAC may also establish ad-hoc sub-committees or working groups to review and assess specific policy and management measures (DFO, 2002 & 2014). DFO reviews and evaluates compliance and monitoring on a regular basis (DFO, 2013; MSC 2016) Therefore, the fishery has in place mechanisms to evaluate all parts of the management system, thereby meeting the SG 100.		
b	Guidepost	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	Y	N	N
	Justification	ICCAT ICCAT regularly reviews the fishery specific management system through various committees, e.g. ICCAT's Conservation and Management Measures Compliance Committee monitors and evaluates compliance with the Convention and ICCAT Recommendations. Also, as an RFMO, ICCAT has agreed to follow international best practice and undertake periodic reviews of their performance with respect to their mandate. In so doing, ICCAT has undertaken two independent "Performance Reviews" (Hurry et al 2016 and Spencer et al 2008) and published their findings on the ICCAT website. Canada Annual meetings of ALPAC and SFLPAC provide an opportunity to internally review and evaluate key parts of the management system. Both committees may also establish ad-hoc sub-committees or working groups to review and assess specific policy and management measures (DFO, 2002 and DFO 2014). DFO also reviews and evaluates compliance and monitoring on a regular basis.		

PI 3.2.5		<p>There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives</p> <p>There is effective and timely review of the fishery-specific management system</p>
		<p>With respect to external review, Canadian fisheries are reviewed by a number of institutions, e.g. The House of Commons and the Senate's Standing Committees on Fisheries and Oceans. Also, the Canadian Auditor General has, on an ad-hoc basis, reviewed fisheries related issues, although this has not happened since 2009 when the protection of fish habitat was reviewed (OAGC 2009). However, the Canadian swordfish longline fishery has never been subject to an external review by either these Committees or the OAGC.</p> <p>The fishery-specific management system is therefore subject to regular internal review, thereby meeting the SG 60, however, while there are a number of institutions that undertake external reviews of Canadian fisheries, the swordfish longline fishery has never been subject to their, or any other, external review. Therefore, it cannot be said the fishery-specific management system is subject to occasional external review and so the SG 80 is not met.</p>
References		<p>DFO (2002) ALPAC Terms of Reference</p> <p>DFO (2013) Integrated Fisheries Management Plans (IFMPs) for swordfish and other tuna species (albacore, bigeye and yellowfin tuna) http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/swordfish-espardon/NEW-swordfish-2013-espado-eng.htm</p> <p>DFO (2014) SFLPAC Terms of Reference</p> <p>Hurry, G., Hayahi, M., Maguire, J.J., (2009) Report of the Independent Performance Review of ICCAT 2009. https://www.iccat.int/Documents/Other/PERFORM_%20REV_TRI_LINGUAL.pdf</p> <p>MSC (2016) North West Atlantic Canada Longline Swordfish Annual Audit Reports https://fisheries.msc.org/en/fisheries/north-west-atlantic-canada-longline-swordfish/@assessments</p> <p>OAGC (2009) Protecting Fish Habitat. Chapter 1 in a report to Parliament by the Office of the Auditor General of Canada. http://oag-bvg.gc.ca/internet/docs/parl_cesd_200905_01_e.pdf</p> <p>Spencer, J., Maguire, J.J., Molenaar, E., (2016) Report of the Independent Performance Review of ICCAT. http://www.iccat.es/Documents/Other/O-2nd_PERFORMANCE_REVIEW_TRI.pdf</p>
OVERALL PERFORMANCE INDICATOR SCORE: SI a:80; SI b:60		75
CONDITION NUMBER (if relevant):		2

Appendix 2: Conditions

Note: MSC require that if conditions are raised in the re-assessment, the CAB shall include an explanation of:

- a) If and how any of the new conditions relate to previous conditions raised in the previous assessment or surveillance audits; and,
- b) If and why any conditions that were raised and then closed in the previous assessment are being raised again in the reassessment.

Two Principle 3 related conditions have been set for the fishery. One of them relates to a previous condition that was raised in the initial assessment against PI 3.2.2..

The condition raised against PI 3.2.2 in the initial assessment (Condition 10) related to a weakness identified in the decision-making processes at the international level (ICCAT), in relation to use of the precautionary approach. This was closed at the second annual audit. The reason for the condition against PI 3.2.2 in this re-assessment relates to the domestic level (Canada) decision-making processes and the use of the precautionary approach.

Condition 1

Performance Indicator	PI 3.2.2 - The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.
Score	75
Rationale	<p>SG 80, SI (c): Decision-making processes use the precautionary approach and are based on best available information.</p> <p>Canada The precautionary approach is required for all fisheries as a matter of policy as outlined in the “Sustainable Fisheries Framework” (DFO 2009a). The IFMP (DFO, 2013) includes a section on the precautionary approach and how it is adopted in fisheries management within Canada. The focus of the approach is on fisheries resources, i.e. swordfish, tuna and shark species, and is based on best available information.</p> <p>How the precautionary approach is used in decision-making processes for non-commercial species is not explicit within the management plan or any other document that the assessment team had access to. Given the fisheries interaction with turtle species, the lack of an explicit rationale for how the precautionary approach is, or is not necessarily, being used with respect to this issue means the SG 80 is not met.</p>
Condition	By the third audit the client shall provide evidence of how the precautionary approach is, or is not necessarily, being used with respect to the fisheries interaction with turtle species in the decision-making processes within the Canadian longline swordfish fishery.
Milestones	<p>At the first audit the client will provide evidence in the form of minutes and/or meeting reports showing discussion of the how the precautionary approach is or is not necessarily, being used in decision making processes with respect to the management of the Canadian longline swordfish fishery.</p> <p>This milestone is an incremental step toward fulfilling the condition. Its successful completion will not result in a change of score to the PI; the score will remain at 75.</p> <p>At the second audit the client shall provide evidence in the form of minutes and/or meeting reports showing how the precautionary approach will, or will not</p>

	<p>necessarily, be used in decision making processes with respect to the management of the Canadian longline swordfish fishery.</p> <p>This milestone is an incremental step toward fulfilling the condition. Its successful completion will not result in a change of score to the PI; the score will remain at 75.</p> <p>At the third audit the client shall provide evidence of how the precautionary approach is, or is not necessarily being used, with respect to the fisheries interaction with turtle species in the decision-making processes within the Canadian longline swordfish fishery.</p> <p>Successful completion of this and the previous milestones will demonstrate that decision-making processes use the precautionary approach and are based on best available information. This will result in the rescoring of this PI to at least 80.</p>
<p>Client action plan</p>	<p>The MSC assessment team concluded that while the IFMP (DFO, 2013) includes details of how the precautionary approach is used in the management decisions for fisheries resources, i.e. swordfish, tuna and shark species, and is based on best available information, there was a lack of evidence in the IFMP, or other documents, on how the precautionary approach is used in decision making for non-commercial species, in particular, sea turtles.</p> <p>In order to meet the condition, the client will follow a step-wise approach, necessitated by the consultative and administrative process associated with the DFO management of the fishery to achieve the incremental steps identified in the condition milestones.</p> <p>At the first audit the client, will provide evidence that during the first year of certification, they have worked with DFO and other stakeholders to ensure that the precautionary approach is used in decision making with respect to the fishery's interactions with non-commercial species, in particular, sea turtles.</p> <p>The client will undertake the following actions:</p> <ul style="list-style-type: none"> • Advocate, through correspondence with the Regional Director of Fisheries for the Maritimes Region, their support and willingness to work with DFO to consider how best to ensure and have the management process more clearly articulate and document how the precautionary approach is used in decision making for non-commercial species, in particular, sea turtles, in the management of the swordfish longline fishery. The client will promote that this is done through and in combination with: the IFMP, Species at Risk Action Plans, Recovery Strategies for Loggerhead and Leatherback Sea Turtles, the DFO Sustainable Fisheries Framework (SSF) and their policy on managing By-Catch by the pelagic longline (PLL) fleet. • Request, through the annual meetings of the Scotia Fundy Large Pelagics Advisory Committee (SFLPAC) and the Atlantic Large Pelagic Advisory Committee (ALPAC), that DFO consider how best to ensure and more clearly articulate and document how the precautionary approach is used in decision making for non-commercial species, in particular, sea turtles, in the management of the swordfish longline fishery. <p>At the first surveillance audit, the client will provide minutes / meeting reports and any correspondence with DFO, SFLPAC, and ALPAC showing the above actions.</p> <p>This will demonstrate the client's active participation and advocacy in ensuring and demonstrating how the precautionary approach is used in decision making for non-commercial species, in particular, sea turtles, in the management of the swordfish longline fishery.</p> <p>At the second audit the client shall demonstrate that during the second year of certification, they have undertaken the following:</p>

	<ul style="list-style-type: none"> Continue to work with DFO and other stakeholders, through the SFLPAC and the ALPAC, and / or Working Groups thereof, to ensure and demonstrate how the precautionary approach is used in decision making for non-commercial species, in particular, sea turtles, in the management of the swordfish longline fishery. Correspond with senior DFO regional staff and request that DFO provide an update on how they intend to more clearly document how the precautionary approach is used in decision making for non-commercial species, in particular, sea turtles, in the management of the swordfish longline fishery. This information will be requested so that it will be available for the second surveillance audit. <p>At the second surveillance audit, the client will provide minutes / meeting reports and any correspondence with DFO, SFLPAC, and ALPAC to demonstrate the client's active participation and advocacy in ensuring and demonstrating how the precautionary approach is used in decision making for non-commercial species, in particular, sea turtles, in the management of the swordfish longline fishery. As a result, it will also demonstrate the outcomes that have been achieved.</p> <p>At the third audit the client, through advocacy and promotion in years 1 and 2, will provide documentary evidence that demonstrates how the precautionary approach is used in decision making for non-commercial species, in particular, sea turtles, in the management of the swordfish longline fishery.</p>
Consultation on condition	<p>The client has an ongoing collaborative relationship with DFO and while formal confirmation of commitment to the client action plan has not been received at the time of the PCDR this is due to the availability of key staff and the team have no reservations about accepting the CAP. The Final Report will include formal confirmation of DFO's acceptance.</p>

Condition 2

Performance Indicator	PI 3.2.5 - There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives. There is effective and timely review of the fishery-specific management system.
Score	75
Rationale	<p>SG 80, SI (b):</p> <p>The fishery-specific management system is subject to regular internal and occasional external review.</p> <p>Canada</p> <p>Annual meetings of ALPAC and SFLPAC provide an opportunity to internally review and evaluate key parts of the management system. Both committees may also establish ad-hoc sub-committees or working groups to review and assess specific policy and management measures (DFO, 2002 and DFO 2014). DFO also reviews and evaluates compliance and monitoring on a regular basis.</p> <p>With respect to external review, Canadian fisheries are reviewed by a number of institutions, e.g. The House of Commons and the Senate's Standing Committees on Fisheries and Oceans. Also, the Canadian Auditor General has, on an ad-hoc basis, reviewed fisheries related issues, although this has not happened since 2009 when the protection of fish habitat was reviewed (OAGC 2009). However, the Canadian swordfish longline fishery has never been subject to an external review by either these Committees or the OAGC.</p> <p>The fishery-specific management system is therefore subject to regular internal review, thereby meeting the SG 60, however, while there are a number of institutions that undertake external reviews of Canadian fisheries, the swordfish longline fishery has never been subject to their, or any other, external review.</p>

	Therefore, it cannot be said the fishery-specific management system is subject to occasional external review and so the SG 80 is not met.
Condition	By the third annual audit the client shall provide evidence that the longline swordfish fishery management system is subject to regular internal and occasional external review.
Milestones	<p>At the first audit the client will provide evidence in the form of minutes and/or meeting reports showing discussion on how it will to initiate and adopt an occasional external review of the longline swordfish fishery management system.</p> <p>This milestone is an incremental step toward fulfilling the condition. Its successful completion will not result in a change of score to the PI; the score will remain at 75.</p> <p>At the second audit the client shall provide evidence in the form of minutes and/or meeting reports showing how an occasional external review of the longline swordfish fishery management system will be adopted.</p> <p>This milestone is an incremental step toward fulfilling the condition. Its successful completion will not result in a change of score to the PI; the score will remain at 75.</p> <p>At the third audit the client shall provide evidence that the longline swordfish fishery management system is subject to occasional external review and the review has or will be initiated and completed within four years of the re-certification date of the fishery.</p> <p>Successful completion of this and the previous milestones will demonstrate that the Canadian longline swordfish fishery management system is subject to regular internal and occasional external review This will result in the rescoring of this PI to at least 80.</p>
Client action plan	<p>The MSC team concluded that Canadian fisheries are reviewed by a number of national institutions, .eg. The House of Commons and Senate's Standing Committee on Fisheries and Oceans, and also by the Canadian Auditor General on an ad-hoc basis. However, the MSC assessment team also concluded that the Canadian longline swordfish fishery has never been subject to an external review by either of the Committees or the Auditor General.</p> <p>At the first audit the client will provide evidence that during the first year of certification they have worked with DFO to ensure that the longline swordfish fishery management system is subject to regular internal and occasional external review.</p> <p>During this time period the client will undertake the following:</p> <ul style="list-style-type: none"> • Advocate, through correspondence with the Regional Director of Fisheries for the Maritimes Region, that there be an occasional external review (at least every 5-years, i.e. within the life of an MSC certification) by recognised experts, of the management system. • Request, through the annual meetings of SFLPAC and ALPAC that DFO consider the occasional external review (at least every 5-years, i.e. within the life of an MSC certification) by recognised experts, of the management system. • If DFO do not agree to undertake a review of the management system, the client will initiate their own review by identifying and approaching an appropriately qualified specialist to undertake the review. • The client's intent will be to present the outcome of the review to DFO, SFLPAC, and ALPAC processes. <p>At the first surveillance, audit the client will provide minutes / meeting reports and any correspondence with DFO, SFPLAC, and ALPAC showing the above actions and outcomes.</p>

	<p>If the client is not successful in gaining DFO support for an external review the client will provide evidence of identifying and approaching an appropriately qualified specialist and the terms of reference for their review.</p> <p>This will demonstrate the client's active participation and advocacy in establishing an occasional review of the fishery's management system.</p> <p>At the second audit the client shall provide evidence that it has undertaken the following actions in the second year of certification:</p> <ul style="list-style-type: none"> • Continue to work with DFO in establishing an occasional review of the fishery's management system. • If DFO do not agree to undertake an external review of the management system, the client will provide evidence of the contractual arrangements they have in place with an appropriately qualified specialist to undertake the review. <p>The client will provide minutes / meeting reports and any correspondence with DFO, SFLPAC and ALPAC showing the above actions and outcomes.</p> <p>If the client has not been successful in gaining DFO support for an external review the client will provide evidence of a contract with an appropriately qualified specialist and an agreed plan of work.</p> <p>At the third audit the client shall provide evidence that through the advocacy and promotion in years 1 and 2 or through the establishment of a contract with an appropriately qualified specialist, the client will provide documentary evidence that an external review of the management system has taken place and that the results have been presented to DFO, SFLPAC, and ALPAC and that comments and reactions have been sought.</p>
<p>Consultation on condition</p>	<p>The client has an ongoing collaborative relationship with DFO and while formal confirmation of commitment to the client action plan has not been received at the time of the PCDR this is due to the availability of key staff and the team have no reservations about accepting the CAP. The Final Report will include formal confirmation of DFO's acceptance.</p>

Appendix 3: Peer Review Reports

Peer Reviewer 1

Summary of Peer Reviewer Opinion

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes/No YES	CAB Response
<p><u>Justification:</u> It is a well documented and written report. The fish stock is healthy; the fishing gear is has some bycatch issues, but they are well documented; and the management is sound. The scoring is appropriate to the evidence presented. My only concern is with the handling of the catch characterization. The assessment team used the landed catch to estimate the catch distribution by species (Table 4), rather than the observed total catch (table 6). The result of this is that some minor species were not included in the catch evaluation. While this does not affect the scoring outcome, it does not follow the MSC CR.</p>		Noted thank you.

<i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCR 7.11.1 and sub-clauses]</i>	Yes/No YES	CAB Response
<p><u>Justification:</u> There are two conditions raised in this assessment, and they are appropriately written, so as to be achievable by the fishery during the assessment period: Condition (#1) for PI 3.2.2 requires: By the third audit the client shall provide evidence of how the precautionary approach is, or is not necessarily, being used with respect to the fisheries interaction with turtle species in the decision-making processes within the Canadian longline swordfish fishery Condition #2 on PI 3.2.5, that requires: By the third annual audit the client shall provide evidence that the harpoon swordfish fishery management system is subject to regular internal and occasional external review. This condition when met by the fishery, will bring the PI score to the SG level. There are also five recommendations.</p>		Noted thank you.

If included:

<i>Do you think the client action plan is sufficient to close the conditions raised? [Reference FCR 7.11.2-7.11.3 and sub-clauses]</i>	Yes/No YES	CAB Response
<p><u>Justification:</u> The CAPs are detailed, and are sufficient to meet the conditions by the third annual audit as required.</p>		Noted thank you.

Performance Indicator Review

Please complete the appropriate table(s) in relation to the CAB's Peer Review Draft Report:

- For reports using one of the default assessment trees (general, salmon or enhanced bivalves), please enter the details on the assessment outcome using Table 16.
- For reports using the Risk-Based Framework please enter the details on the assessment outcome at

Table 17.

- For reports assessing enhanced fisheries please enter the further details required at Table 18.

Table 16 For reports using one of the default assessment trees:

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.1.1	Sla -Yes Slb -Yes	Sla -Yes Slb -Yes	NA		Noted thank you.
1.1.2	Sla -Yes Slb -Yes Slc -Yes Sld -NA	Sla -Yes Slb -Yes Slc -Yes Sld -NA	NA		Noted thank you.
1.2.1	Sla -Yes Slb -Yes Slc -Yes Sld -Yes Sle -NA	Sla -Yes Slb -Yes Slc -Yes Sld -Yes Sle -NA	NA	Overall PI score should be 85, and 1 of 3 SG100s are met, Sld is scored at SG100	Thank you for the comment. This has been corrected.
1.2.2	Sla -Yes Slb -Yes Slc -Yes	Sla -Yes Slb -Yes Slc -Yes	NA		Noted thank you.
1.2.3	Sla -Yes Slb -Yes Slc -Yes	Sla -Yes Slb -Yes Slc -Yes	NA		Noted thank you.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.2.4	Sl a -Yes Sl b -Yes Sl c -Yes Sl d -Yes Sl e -Yes	Sl a -Yes Sl b -Yes Sl c -Yes Sl d -Yes Sl e -Yes	NA		Noted thank you.

2.1.1	Sla -No Slb -No Slc -Yes Sld -No	Sla -No, Slb -No Slc -Yes Sld -No	NA	<p>The list of species to be addressed in the catch characterization is based on the landed catch distribution (Table 4) down to 0.01%. But then the characterization should be based on the total catch (GCB3.5.2, and 3.8.2), as would be determined based on observer coverage, not just the landed catch. As a result at least 6 minor species listed in Table 5 have not been addressed in the scoring as either retained or bycatch (manta ray, blue marlin, dolphin, pelagic sting ray, black marlin, great hammerhead shark, and longfin mako shark) . It is not possible to fully evaluate this PI with an incorrect list of species in the catch, additionally, not all the identified minor species are listed in the Met row for the SG100 score for Sla andSlb, and for the SG 60 for Sld. . Finally, these minor species must be added to the summary table.</p> <p>No information on the species stock status or total catches of the bait species as compared to the estimate of bait used in the Canadian longline fishery, is provided, other than the statement that the bait used, is extremely small relative to the total catch of the species. Therefore there is no basis to evaluate review the scoring bait species in question.</p>	<p>Thank you for the comment. The assessment team has based the assessment on Table 5 (observer data), where the classification as target, main retained, minor retained, main bycatch, minor bycatch, ETP species and negligible is colour coded for clarity. Table 4 (landings data) is provided for context. With respect to the negligible species, however, it is noted that the text states: "All other species comprising less than 0.1% of the catch are considered to be negligible components of the catch (Table 4), and are not considered further here or in scoring." The correct reference should have been Table 5, so this has been corrected.</p> <p>With regard to the scoring calculation, all the species that are scored (i.e., as main and minor retained species) are listed. The negligible species (GCB 3.8.2) are not scored.</p> <p>The Assessment Team is unclear why it is thought that there is no information on bait quantities used or on population status provided. Information on all three species is provided in Sla, and additional information on Argentine squid and chub mackerel is provided in Sld (where status is poorly known). No changes have been made.</p>
2.1.2	Sla -No Slb -No Slc -No Sld -No Sle- No	Sla -No Slb -No Slc -No Sld -No Sle- No	NA	Same comment as PI 2.1.1	Thank you for the comment. We have responded above.
2.1.3	Sla -No Slb -No	Sla -No Slb -No	NA	Same comment as PI 2.1.1	Thank you for the comment. We have responded above.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
	Slc -No Sld -No	Slc -No Sld -No			
2.2.1	SlA -No Slb -NA Slc -NA	SlA -No Slb -NA Slc -NA	NA	The list of species to be addressed in the catch characterization is based on the landed catch distribution (Table 4) down to 0.01%. But then the characterization should be based on the total catch (GCB3.5.2 and 3.8.2), as would be determined based on observer coverage, not just the landed catch. As a result at least 6 minor species listed in Table 5 have not been addressed in the scoring as either retained or bycatch (manta ray, blue marlin, dolphin, pelagic sting ray, black marlin, great hammerhead shark, and longfin mako shark) . It is difficult to evaluate this PI with an incorrect list of species in the catch. . Additionally these minor species must be added to the summary table.	Thank you for the comment. The reponses provided against comments for PI 2.1.1 also apply here. The assessment is based on Table 5 (observer data), while Table 4 (landings data) was provided for context. Negligible catch components were not assessed.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.2.2	Sla -No Slb -Yes Slc -Yes Sld -Yes	Sla -No Slb -Yes Slc -Yes Sld -Yes	NA	While the main bycatch species will not change with the addition of the six minor species, the additional species must be listed, but they will not change the PI score. Additionally these minor species must be added to the summary table.	Noted thank you. Please see comments above.
2.2.3	Sla -Yes Slb -No Slc -Yes Sld -Yes	Sla -Yes Slb -No Slc -Yes Sld -Yes	NA	While the main bycatch species will not change with the addition of the six minor species, the additional species must be listed, however they will not change the PI score. . Additionally these minor species must be added to the summary table.	Noted thank you. Please see comments above.
2.3.1	Sla -Yes Slb -Yes Slc -Yes	Sla -Yes Slb -Yes Slc -Yes	NA		Noted thank you.
2.3.2	Sla -Yes Slb -Yes Slc -Yes Sld -Yes	Sla -Yes Slb -Yes Slc -Yes Sld -Yes	NA		Noted thank you.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.3.3	SIa -Yes SIb -Yes SIc -Yes	SIa -Yes SIb -Yes SIc -Yes	NA	A recommendation (#2) for SIa is proposed that client support and pursue a re-running of the Regional Peer Review assessment of incidental catch in the Atlantic Canadian swordfish/other tuna longline fishery (i.e., DFO 2016k), or a similar process, to review the approach to incidental catch monitoring in the longline swordfish fishery. A key aim should be to determine what, if any, changes are needed to the observer programme to ensure that the data collected are adequately representative of the fishery. This is appropriate. A recommendation (#3) for SIb is proposed that the client provides DFO with clear and well publicised support for the timely completion of the loggerhead sea turtle tagging study through advocating to the swordfish longline fishermen of the need to identify and fulfil suitable opportunities to take DFO tagging staff on swordfish and combined swordfish and tuna longline trips in 2017. This is also appropriate.	Noted thank you.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.4.1	Sla - Yes	Sla - Yes	NA		Noted thank you.
2.4.2	Sla -Yes Slb -Yes Slc -Yes Sld -Yes	Sla -Yes Slb -Yes Slc -Yes Sld -Yes	NA		Noted thank you.
2.4.3	Sla -Yes Slb -Yes Slc -Yes	Sla -Yes Slb -Yes Slc -Yes	NA	A recommendation (#4) for Slb is proposed that information on the amounts and locations of any lost gear (i.e., number of hooks and floats, length of mainline, etc.) are recorded centrally and reported annually. This would help to inform the assessment of risk to habitats and may allow for higher scores to be generate. This is appropriate.	Noted thank you.
2.5.1	Sla - Yes	Sla - Yes	NA		Noted thank you.
2.5.2	Sla -Yes Slb -Yes Slc -Yes Sld -Yes	Sla -Yes Slb -Yes Slc -Yes Sld -Yes	NA	The Yes/No for the SGs 80 and 100 are not identified for score for Sld.	Noted thank you. This has now been corrected.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.5.3	Sla -Yes Slb -Yes Slc -Yes Sld -Yes Sle- Yes	Sla -Yes Slb -Yes Slc -Yes Sld -Yes Sle- Yes	NA		Noted thank you.
3.1.1	Sla -Yes Slb -Yes Slc -Yes	Sla -Yes Slb -Yes Slc -Yes	NA		Noted thank you.
3.1.2	Sla -Yes Slb -Yes Slc -Yes	Sla -Yes Slb -Yes Slc -Yes	NA		Noted thank you.
3.1.3	Sla -Yes	Sla -Yes	NA		Noted thank you.
3.1.4	Sla -Yes	Sla -Yes	NA	Note, the reviewer added a row here.	Noted thank you.
3.2.1	Sla -Yes	Sla -Yes	NA		Noted thank you.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.2.2	SlA -Yes Slb -Yes Slc -Yes Sld -Yes Sle- Yes	SlA -Yes Slb -Yes Slc -Yes Sld -Yes Sle- Yes	Yes, condition (#1) is placed on the fishery relative to Slc, and implementation of the CAP will result in the fishery meeting the SG80 score when complete.	A recommendation (#5) for SlA was included with this PI scoring that proposes the IFMP is updated annually and, in so doing a record of amendment is maintained in order to show changes. The condition (#1) for Slc is: By the third audit the client shall provide evidence of how the precautionary approach is, or is not necessarily, being used with respect to the fisheries interaction with turtle species in the decision-making processes within the Canadian longline swordfish fishery.	Noted thank you.
3.2.3	SlA -Yes Slb -Yes Slc -Yes Sld -Yes	SlA -Yes Slb -Yes Slc -Yes Sld -Yes	NA		Noted thank you.
3.2.4	SlA -Yes Slb -Yes	SlA -Yes Slb -Yes	NA		Noted thank you.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.2.5	SlA -Yes Slb -Yes	SlA -Yes Slb -Yes	Yes, condition (#2) is placed on the fishery relative to Slb, and implementation of the CAP will result in the fishery meeting the SG80 score.	Note, the reviewer added a row here also. Condition (#2) is: By the third annual audit the client shall provide evidence that the longline swordfish fishery management system is subject to regular internal and occasional external review.	Noted thank you.

Table 17 For reports using the Risk-Based Framework:

Performance Indicator	Does the report clearly explain how the process(es) applied to determine risk using the RBF has led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response:
1.1.1				
2.1.1				
2.2.1				
2.3.1				
2.4.1				
2.5.1				

Table 18 For reports assessing enhanced fisheries:

<p><i>Does the report clearly evaluate any additional impacts that might arise from enhancement activities?</i></p> <p>Note: Justification to support your answers is only required where answers given are 'No'.</p>	<p>Yes/No</p>	<p>CAB Response:</p>
<p><u>Justification:</u></p>		

Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary) can be added below and on additional pages

Some general editorial comments on the report:

1. Table 2 page 16, the reference to 189.46% is most likely a typo. (**CAB response:** This comment relates to the harpoon fishery report)
2. Page 22 the Kobe plot, the axis appear to be labeled incorrectly, and the figure caption is also confusing. However, it is interesting that it was this was in the referenced report. The y axis should be F/Fmsy and the x axis should be B/Bmsy, with no reference to the date. The Kobe plot describes the trajectory of the fishery over time as a function of B/Bmsy and F/Fmsy. The last point on the plot is for 2015, and in this case includes a range of model solutions to indicate uncertainty. (**CAB response:** The Kobe Plot in this instance is perhaps a little confusing without careful consideration of the caption. The axes are correct and refer to the scatter of 1,000 B2012/Bmsy estimates resulting from a grid of assessment model runs. The single track relates to just one of the runs, for which the B2012/Bmsy is highlighted)
3. The references listed for several of the P3 PIs were not cited in the actual scoring text. (**CAB response:** This section has been reviewed and amended)

Peer Reviewer 2

Summary of Peer Reviewer Opinion

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes	CAB Response
<u>Justification:</u> The assessment is detailed, well considered and written. It acknowledges the weaknesses found in the first assessment and how these have been successfully addressed through four conditions (all were all closed out by the 6 th surveillance audit).		Noted thank you.

<i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCR 7.11.1 and sub-clauses]</i>	Yes	CAB Response
<u>Justification:</u> <u>Condition 1:</u> Is focused e.g. on the key risk of interaction of the longline gear with turtles, and achievable within three years. <u>Condition 2:</u> Provides a detailed process that needs to be followed with realistic timelines.		Noted thank you.

If included:

<i>Do you think the client action plan is sufficient to close the conditions raised? [Reference FCR 7.11.2-7.11.3 and sub-clauses]</i>	Yes	CAB Response
<u>Justification:</u> <u>Condition 1:</u> Is practical and likely to be effective <u>Condition 2:</u> Is practical. Recognises that DFO is not bound to request an external review, so provides a practical alternative.		Noted thank you.

Performance Indicator Review

Please complete the appropriate table(s) in relation to the CAB's Peer Review Draft Report:

- For reports using one of the default assessment trees (general, salmon or enhanced bivalves), please enter the details on the assessment outcome using Table 16.
- For reports using the Risk-Based Framework please enter the details on the assessment outcome at

Table 17.

- For reports assessing enhanced fisheries please enter the further details required at Table 18.

Table 19 For reports using one of the default assessment trees:

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.1.1	Yes	No	N/A	SI (a): The certifier gave a score of 100 for this SI. With no new stock assessment since 2011, I wonder if there is a 'high degree of certainty that the stock is above the point where recruitment would be impaired'. Even the most recent ICCAT 'Outlook' is two years old. The team should re-consider this, either re-scoring or justifying the existing score further.	The high degree of certainty relates to specified probability levels. The rationales for si(a) and si(b) relating to PRI and targets clearly explain available evidence and probability levels and also how the best available information suggests the stock size will have likely increased since the last assessment. We consider the 100 score for si(a) and 80 score for si(b) to be robust. The scores have also been agreed through a harmonisation process.
1.1.2	Yes	Yes	N/A		Noted, thank you.
1.2.1	Yes	Yes	N/A		Noted, thank you.
1.2.2	Yes	Yes	N/A		Noted, thank you.
1.2.3	Yes	Yes	N/A		Noted, thank you.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.2.4	Yes	Yes	N/A		Noted, thank you.
2.1.1	Yes	Yes	N/A		Noted, thank you.
2.1.2	Yes	Yes	N/A		Noted, thank you.
2.1.3	Yes	Yes	N/A		Noted, thank you.
2.2.1	Yes	Yes	N/A		Noted, thank you.
2.2.2	Yes	Yes	N/A		Noted, thank you.
2.2.3	Yes	Yes	N/A		Noted, thank you.
2.3.1	Yes	Yes	N/A		Noted, thank you.
2.3.2	Yes	Yes	N/A		Noted, thank you.
2.3.3	Yes	Yes	N/A		Noted, thank you.
2.4.1	Yes	Yes	N/A		Noted, thank you.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.4.2	Yes	Yes	N/A		Noted, thank you.
2.4.3	Yes	Yes	N/A		Noted, thank you.
2.5.1	Yes	Yes	N/A		Noted, thank you.
2.5.2	Yes	Yes	N/A		Noted, thank you.
2.5.3	Yes	Yes	N/A		Noted, thank you.
3.1.1	Yes	Yes	N/A		Noted, thank you.
3.1.2	Yes	Yes	N/A		Noted, thank you.
3.1.3	Yes	Yes	N/A		Noted, thank you.
3.1.4	Yes	Yes	N/A		Noted, thank you.
3.2.1	Yes	Yes	N/A		Noted, thank you.
3.2.2	Yes	Yes	Yes		Noted, thank you.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.2.3	Yes	Yes	N/A		Noted, thank you.
3.2.4	Yes	Yes	N/A		Noted, thank you.
3.2.5	Yes	No	Yes	We suggest that the SI(c) rationale text specially mentioned that Condition 2 is being raised and why.	Noted, thank you. The text has been amended to more clearly say why the condition has been raised.

Table 20 For reports using the Risk-Based Framework:

Not applicable (the RBF was not used in this re-assessment)

Performance Indicator	Does the report clearly explain how the process(es) applied to determine risk using the RBF has led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response:
1.1.1				
2.1.1				
2.2.1				
2.3.1				
2.4.1				
2.5.1				

Table 21 For reports assessing enhanced fisheries:

Not applicable

<p><i>Does the report clearly evaluate any additional impacts that might arise from enhancement activities?</i></p> <p>Note: Justification to support your answers is only required where answers given are 'No'.</p>	<p>Yes/No</p>	<p>CAB Response:</p>
<p><u>Justification:</u></p>		

Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary) can be added below and on additional pages

Section 3.6.2.2 Mentions two papers by Campana et al. (2015 & 2016), but only the 2015 document is mentioned in the scoring under 2.2.1. Note also Campana is spelled wrong in the main text (Camapana). (**CAB response:** Noted and amended)

Appendix 4: Stakeholder submissions at site visit

The Ecology Action Centre provided a detailed written submission during the site visit it specifically related to the 4th annual audit of the fishery. The written submission and the audit team response were included within the 4th annual audit report.

The following is an additional submission that was sent by email and received by the assessment team on 2nd November 2016.



tel. 902.429.2202 2705 Fern Lane, fax. 902.405.3716 Halifax, NS, B3K 4L3

October 31, 2016

Ecology Action Centre Comments for Re-Assessment of Canada North West Atlantic Swordfish

The Ecology Action Centre submits the following comments as input for the re-assessment of Canada's North West Atlantic Swordfish fishery.

Both the harpoon and longline clients will have outstanding conditions at the end of their current certification period. We have concerns of recertification being granted if these conditions are not fulfilled.

Harpoon Unit of Certification

The harpoon unit of certification will have outstanding Condition 2 related to the adoption of Harvest Control Rules (HCRs) at ICCAT. According to the MSC P1 ICCAT Harmonization workshop outcome, the condition will remain open since ICCAT failed to adopt HCRs as expected in 2015. The ICCAT SCRS is now expected to give advice on HCRs for North Atlantic Swordfish by 2018. This leaves the fishery clients and MSC in a difficult position. HCRs are required for fisheries to score 80 as a basic principle of sustainable fisheries management.

We recognize that it is a difficult process to balance scoring for fisheries that are ultimately managed at the RFMO level. We also recognize that fisheries clients do not have full control over decision making at RFMOs and can therefore face challenges meeting conditions. However, since MSC has set its standard to include the RFMO level in its scoring of management, it is important that even ICCAT decisions are held to the MSC standard for certification purposes. MSC is an important tool that is part of a suite that is used to push progress at the RFMOs, which have traditionally been slow to adopt modernized fisheries management. With many RFMO managed fisheries around the world entering re-assessment in the MSC system in the near future and many RFMO stocks still lacking key management tools such as HCRs and Limit Reference Points (LPRs), the MSC standard will be compromised if fisheries continue to be granted certification without fulfilling such management requirements.

MSC certification provides an incentive for fisheries and countries to push progress at RFMOs in order to fulfill their certification requirements and maintain their markets. However, this incentive only remains if there is a real consequence of losing certification should they fail to fulfill conditions or action plans as required.

Longline Unit of Certification

Our comment above regarding the outstanding Condition 2 applies to the longline client also. More concerning is the lack of progress the longline client has made during the certification period on conditions under Principle 2.

We submit that the fishery client should not receive re certification. Their certification should be suspended under the MSC guidance that calls for suspension when a fishery 'has not made adequate progress towards addressing conditions' by the end of its certification period.

Please see our detailed comments on scoring guideposts and conditions progress below. Please also refer to our comments on condition progress submitted to the team for the final audit of the fishery.

We note that the fishery client has been aware for years of the progress needed to address its impact on bycatch species and the gaps in data collection, research, and observer coverage that have been called into question. The conditions placed on the fishery in the original certification period focused on these areas and the CAB was satisfied that the client action plans proposed were achievable and realistic in the certification period, despite an objection. The Ecology Action Centre made it clear in our objection that we did not think the action plan was realistic. The CAB argued in the objection process that the success of the action plan could not be assessed prematurely, but rather at the time of audits. So we are now at the final audit and reassessment of the fishery when the progress can be fully assessed and as anticipate, the fishery did not complete the action plans. The 3rd audit of this fishery made it clear that certain conditions were still not fulfilled and would need to be completed before recertification. As we noted in our comments for the final Audit, the client has not been proactive and is now left with more work, data collection, and implementation than is possible in only one year. While some anticipated work was not completed by the government managers and science, much more could have been accomplished by the fishery client themselves. Other MSC certified Canadian fisheries have demonstrated such proactive work to make up for slow moving government process. This client has not shown willingness to make adequate progress for the assessment team to justify moving the goalposts and offering the client any further time through re certification on the outstanding Principle 2 conditions.

To do so would be to erode the credibility of the MSC standard and the objectives of progress in fisheries sustainability that it was made to address. This fishery client has made few, if any, changes to fishing practices on the water as a result of this original certification that the Ecology Action Centre is aware of. Since the original assessment found that practices were not fully sustainable and identified areas that needed change demonstrated, to recertify the same fishing practices seems to undermine the incentive MSC certification can create. We would be pleased to see a full assessment of any changes the fishery has implemented with evidence of impact on Principle 2 issues included in any re certification report.

Thank you for taking our comments and our knowledge of this fishery, Canadian Management, and ICCAT performance into consideration for your re-assessment work.

Sincerely,



Shannon Arnold Marine Policy Coordinator Ecology Action Centre

Scoring Guidepost	EAC Comments	Assessment team response
<p>2.1.1 and 2.1.2 porbeagle</p>	<p>Porbeagle shark is outside of biological limits, having been severely depleted in the past.</p> <p>It is not possible to determine if the partial strategy in place for recovery is ‘demonstrably effective’. (2.1.1c)</p> <p>The comments below apply also for 2.1.1. There is no ‘objective basis for confidence’ that the measures in place for porbeagle recovery will be successful (2.1.2b). There is little evidence that the partial strategy is being implemented successfully (2.1.2 c).</p> <p>The fishery should still receive 75 for both guideposts. The condition previously associated with the guidepost cannot be closed and the client has not made adequate progress against this condition. The certificate should be suspended.</p> <p>The fishery could have been proactive in addressing the following shortcomings, but did not progress adequately throughout the 4 years of certification.</p> <p>As noted in year 3 audit of this fishery: “...it is not clear how management considers this and other sources of uncertainty (e.g. non-Canadian catch) in its decisions on harvest levels. There needs to be evidence that management sets TACs, which recognize sources of uncertainty and the need for precaution in the face of these....</p> <p>While a removal maximum that should not be exceeded has been set for porbeagle shark, i) confidence that removals are estimated adequately needs to be increased and ii) actions that will be taken if the maximum removal are exceeded need to be specified...</p> <p>Closing of the condition during the fourth surveillance audit will require clear articulation of the management response to changes in stock status and how advised catch takes into account uncertainty to determine that the harvest strategy is demonstrably effective. “</p> <p>The fishery client has not resolved the above issues:</p> <ul style="list-style-type: none"> As of yet, there are no defined harvest control rules for porbeagle that would dictate response to changes in stock status. Note, this could have been accomplished for this fishery. It is common for fisheries to propose harvest control rules at the advisory committee level for discussion and adoption. The fishery client has not brought any proposals for actions to be taken when the TAC is approached. It is not clear how this measure is implemented or monitored for success. This is now more urgent as the ICCAT rec 15-06 calls for limiting landings to 2014 levels. 	<p>Many of the points raised here by the EAC were brought to the attention of the audit team at the site visit. The EAC also provided a written submission at that time and this was taken into account in the teams review of these PIs for the audit process. The EAC submission was included within the audit report (Knapman et al. 2017) along with a written response from the audit team. This can be found at: https://fisheries.msc.org/en/fisheries/north-west-atlantic-canada-longline-swordfish/@assessments.</p> <p>The 4th audit concluded that the fishery attained a score of 80 for the conditions that applied to PI 2.1.1 and 2.1.2 and a revised scoring rationale was provided in the audit report. Given the main thrust of the EAC comments here, are the scores for each PI should remain at 75, the revised scoring rationale for PI 2.1.1 is repeated below in order to show how and why the audit team considered the SG 80 was attained. The revised scoring rational for PI 2.1.2 uses much of the same text so is not repeated here, but is equally applicable.</p> <p>This PI was scored 75 in the original assessment (Intertek Moody Marine 2012), with the porbeagle element scoring 70. Since then, new information has been collected and the management approach refined. These changes are detailed below.</p> <p>The latest stock assessment information for porbeagle was presented by Campana et al. (2013). The authors ran four variants of a forward projecting, age and sex-structured life history model, fit to catch-at-length and catch per unit effort data to the end of 2008, although some information including catch and discards was updated to the end of 2011. The four variants of the</p>

Scoring Guidepost	EAC Comments	Assessment team response
	<ul style="list-style-type: none"> • There are also no defined rules for enforcing the 185 TAC for porbeagle that is across all Atlantic Canadian fisheries. None of the relevant IFMPs, including the swordfish and other tunas IFMP, nor the Shark Conservation Action Plan, have any rules for action if the landing TAC was approached or exceeded during the year. It is uncertain that the TAC is enforceable. • There is only an overall 185t TAC for porbeagle in all Atlantic Canada fisheries, not a TAC specific to the management of this fishery. • ICCAT Recommendation 15-06 now requires live release of porbeagle and limiting porbeagle of landings to 2014 levels for all ICCAT fisheries, which was about 40t for all ICCAT fisheries combined.¹ Canada's current TAC would be well above this if caught. It is also unclear how the live release of porbeagle is enforced in the client fishery. • There is also still uncertainty as to whether the observer coverage is sufficient to signal whether there are 'excessive' incidental catches of porbeagle and to ensure the data is capturing accurately the numbers of porbeagle caught, released, and discarded while fishing. • A RPA on Incidental Catch and observer coverage in the swordfish fishery that took place in February 2016 was anticipated by the previous audit teams to address many outstanding concerns about the data reliability and observer coverage for this client. This pertains to a number of outstanding conditions for the longline fleet. • The Ecology Action Centre attended this peer review process and we note our detailed comments below in this table. However, it is important to note that this was not successful process. In fact, the reviewers felt the problems with the meeting were significant enough that no Regional Advisory Report or Research Document could be completed. The working papers that were reviewed at the meeting were not accepted and the proceedings clearly note that they should not be used for reference outside of the meeting.² • This means that the 2011 incidental catch meeting report and observer coverage analysis used in the original scoring of the fishery is still the best analysis available to answer assessment concerns about data collection, monitoring, and coverage. There are no further definitive outcomes or advice of observer coverage requirements. • The original assessment and subsequent audits both say that the 2011 RPA was insufficient for meeting the requirements of the scoring. Therefore, conditions that were relying on improved outcomes from this process cannot be rescored based 	<p>population model differed in their assumed productivity, but all variants of the model predicted porbeagle recovery to 20% of spawning stock numbers (SSN20%) before 2014 if the human-induced mortality rate was kept at or below 4% of the vulnerable biomass (Campana et al., 2013).</p> <p>Hooking mortality and post-release mortality estimates for porbeagle have been assessed by on-board observers of Canadian fishing vessels since 2010 and were reported by DFO (2015). Accounting for landings, capture mortality and post-release mortality, the total annual mortality of porbeagle from all commercial fishing activities in Canadian waters from 2009 to 2014 has averaged 107 t (range 88 – 164 t); this represents a mortality rate of approximately 2% (DFO 2015).</p> <p>Although it is not possible to say that it is highly likely that porbeagle is within biologically-based limits, there are management measures in place for porbeagle in Canada and in the longline swordfish fishery, as detailed in the report but including, for example (from DFO 2016c):</p> <ol style="list-style-type: none"> 1) Corrodible circle hooks and monofilament leaders must be used in the swordfish longline fishery; 2) Longline vessels are required to release all live porbeagle; 3) In the longline fishery, all released porbeagle must be recorded in the logbook, and a record made of their status (i.e., dead or alive); 4) Fins may be removed from sharks taken in the longline fishery, but must be landed with the corresponding carcasses and cannot exceed

Scoring Guidepost	EAC Comments	Assessment team response
	<p>on this latest attempt.</p> <ul style="list-style-type: none"> It is clear there is still uncertainty about data being collected in the client fishery and if observer coverage is significant enough and accurately reflecting interactions across the area of the fishery to detect changes in the retained species status. This is a concern for all retained and bycatch species. Again we note that although DFO has had little resources to support some of the research and observer work needed, the fishery client has know for at least a decade that they have data gaps and issues with impact on bycatch species and could have proactively sought to ensure adequate progress on their certification conditions. They could have sought to address this in a number of ways. For example, they could have done their own research through a consultant or with a conservation group. This is what the Canadian groundfish and shrimp trawl fishery clients have done in order to fulfill their MSC certification conditions for research and reduction of bottom impact – they have created research plans, hired expert consultants, and undertaken sophisticated research that has been open for peer review. They could have opted for video monitoring, a solution that has been brought to them for at least the last six years (EAC and DSF presented our observer data analysis and proposed research and mitigation options at ALPAC in 2009, this is just one example). Other longline fisheries around the world have voluntarily adopted this technology to better characterize their bycatch, test mitigation measures, and to reduce their observer costs. Allowing this fishery to be rescored and close the related conditions means rewarding a lack of action and stalling tactics. Similarly allowed the fishery to continue with a new certification undermines the credibility of the standard. The result will have simply moved the goalposts further down the road and there is no incentive for the fishery to implemented sorely needed research, improved data collection, and mitigation measures to reduce mortality of non- target species. <p>This is the exact opposite of the precautionary approach, which is in place to ensure that a lack of data is not an excuse for inaction.</p>	<p>5% of the weight of the carcasses;</p> <p>5) The fishery is subject to 100% dockside monitoring, and no landings can take place unless a dockside monitor is present;</p> <p>There is also a recommended maximum porbeagle catch limit for all Canadian fisheries of 185 t (DFO 2013), which represents a mortality rate of approximately 4%. If the 185 t catch limit was exceeded, it was confirmed by DFO (pers. comm., Canadian swordfish fishery site visit, October 2016) that this would be considered at the DFO Post-Season review, and additional measures or restrictions could be brought forward for consideration at the Atlantic Large Pelagic Advisory Council (ALPAC) in order to bring catches down (also stated in DFO 2016d).</p> <p>It is noted that the landings of porbeagle from the swordfish fishery have declined from 9.7 t and 16.2 t in 2011 and 2012 respectively, to 3.2 t, 2.7 t and 0.5 t in 2013, 2014 and 2015, respectively (Table 4). The total mortality of porbeagle in all Atlantic Canadian fisheries for 2009-2014 was estimated to average 107 t.</p> <p>Overall, the audit team considers that the measures in place for managing the impact of the swordfish longline fishery on porbeagle constitute at least a partial strategy, and it is demonstrably effective in maintaining the impact of the swordfish longline fishery at a level that will not hinder recovery and rebuilding (i.e., mortality is less than 4%). As such, the SG80 requirement is met. A higher score is not achieved because the SG100 requires that there is, “a high degree of certainty that retained species are within biologically based limits”, and this cannot be confirmed. Nevertheless, an overall score of 80 is clearly achieved.</p>

Scoring Guidepost	EAC Comments	Assessment team response
<p>2.1.2e Shark Finning</p>	<p>The fishery does not meet the 80 score for this indicator. It is not ‘highly likely’ that shark finning is not taking place.</p> <p>This cannot be confirmed for the same reasons the success of the management strategies cannot be confirmed to the 80 score as discussed above. The observer coverage is not adequate in this fishery to ensure no finning is taking place since it is at high risk of interacting with sharks compared to other fisheries.</p> <p>Since 2011, there is no new analysis of the observer coverage or recommendations to ensure sufficient coverage.</p> <p>A new 2016 paper by *** showed that sharks</p> <p>100% dockside monitoring is not a sufficient measure to ensure there is no finning taking place. The Ecology Action Centre has requested the dockside monitoring data in order to analyse its accuracy in terms of weighing and counting the shark landings according to the current 5% fin/carcass ratio rule. We have been informed that the data is not available or kept by DFO. It is unclear how they analyse if their measure is working.</p> <p>The Minister of DFO has confirmed that Canada will be implementing a ‘fins attached policy’ (sharks must be landed with their fins naturally attached to their body) for all domestic fisheries. According to his letter to the EAC, “at the recent meeting of the Northwest Atlantic Fishery Organization (NAFO), Canada indicated it would be implementing a mandatory fins attached policy for all pelagic shark landings across Canada over the coming year.”³ This means the license conditions should be changed by the 2017 season, any delay is unnecessary since it will mean little change to fishery practices (they need only to slice and fold the fins instead of fully cutting them off) if the fishery is indeed already in compliance with the 5% ratio rule.</p> <p>According to guidance CB 3.6.5.1, to score 80 the fishery must implement fins attached or have the ratio and sufficient onboard observer coverage to ensure no finning is taking place. Since the new Canadian management policy will be fins attached - the longline swordfish fleet will need to have this new policy in their license conditions and will need to show compliance.</p> <p>³ See Letter to EAC dated September 26th, 2016 from Minister of Fisheries and Oceans Canada given to the Assessment team.</p>	<p>The Assessment Team disagrees with this comment</p> <p>As noted by the EAC, fins may be removed from sharks taken in the longline fishery, but must be landed with the corresponding carcasses and cannot exceed 5% of the weight of the carcasses (DFO 2016a). In this regard, it is important that the fishery is subject to 100% dockside monitoring, and no landings can take place unless a dockside monitor is present (DFO 2016a). This level of monitoring is as good as it could be, and irrespective of the specific weight data not being provided to the EAC, there is no evidence of non-compliance with this requirement in the form of prosecutions brought against fishers (and no reason to suspect that the DMP is in any way turning a blind eye to the requirements).</p> <p>In summary, there are controls in place in the swordfish longline fishery to manage and monitor for shark finning, there is evidence that the finning licence conditions are being followed. The Assessment Team is content that SG100 is met.</p>

Scoring Guidepost	EAC Comments	Assessment team response
Shark Conservation Action Plan	<p>The Shark Conservation Action Plan (SCAP) has been used in the past assessment as evidence for a management plan for the sharks impacted by the swordfish fishery. This should be taken into account for scoring on retain and bycatch sharks.</p> <p>EAC has reviewed the latest draft and passed our comments to DFO.</p> <p>The SCAP cannot be considered a comprehensive action or recovery plan. The draft we saw is without timelines, measurable outcomes, actions or activities to be implemented, plans or budgets. There may be some activities included in the final plan when it is published, but it is not clear how the SCAP will be implemented and enforced across the numerous fisheries that catch sharks.</p> <p>It is mainly a descriptive document on what is being done for 5 shark species. It does not address all elasmobranch species in a comprehensive document that puts into action both precautionary and ecosystem based approaches to conserving and recovering elasmobranch populations. The SCAP also lists generic fishery management measures that are not specific or applicable to sharks and is misleading.</p> <p>The SCAP is not a specific action plan for the swordfish longliners.</p> <p>The SCAP should not be considered sufficient in terms of enforceable measures and harvest control rules for sharks caught in the client fishery. Related scoring should not be changed based on this document.</p>	<p>Thank you, noted. As described above, there are a variety of measures which the Assessment Team have taken into account in scoring the retained and bycatch PIs, of which the SCAP is just one.</p>
2.1.1 and 2.1.2 Short fin mako	<p>Though, the conditions for 2.1.1 and 2.1.2 related to Short Fin Mako were closed during the certification period, we have a couple of comments for the team to consider in their scoring of the reassessment.</p> <p>In year 2 audit report , the client information notes: “Further more, a similar team from the same Certifier, concluded that the SLLC US North Atlantic Swordfish Longline Fishery met these criteria based on the fact that there was a quota in place, which there is in Canada “</p> <p>There is no quota for short fin mako in Canada. The Shark Conservation Action Plan (SCAP) says there is a ‘non-restrictive quota’. There is no further information about how this is enforced or who it applies to. The SCAP also notes discards are managed. How are they managed?</p> <p>Though the most recent ICCAT assessment has found short fin make to not be overfished, the SCRS noted that this finding is uncertain and recommended catch levels not exceed current</p>	<p>The Assessment Team notes that the SCAP is in place, but that the quota for mako is a bycatch provision of 100 t for all Canadian fisheries. Similar to the bycatch provision for porbeagle, the Audit team understands that if the 100 t bycatch limit was exceeded, this would be considered at the DFO Post-Season review, and additional measures or restrictions could be brought forward for consideration at the Atlantic Large Pelagic Advisory Council (ALPAC) in order to bring catches down. We also note that a full ‘harvest strategy’ is not required by the MSC for P2 species.</p> <p>The latest ICCAT advice (ICCAT 2012) stated: “<i>The 16 models gave very consistent results. All found that the</i></p>

Scoring Guidepost	EAC Comments	Assessment team response
	<p>levels.</p> <p>There is no domestic measure limiting catch in Canada to current levels. There are no defined rules in place for actions should any levels be exceeded. Nor is there certainty that the observer levels and data are sufficient yet to fully account for all hooking and mortality.</p> <p>Having no hard limits on catch and no harvest control rules would not happen for a commercially important species in fisheries management today and it is not a precautionary way to manage species, such as sharks that are inherently vulnerable. This should be noted in assessing the evidence that the precautionary principle is being applied in P3 scoring.</p>	<p><i>median of the current stock abundance was above B_{MSY}. All found the median F was less than F_{MSY}, except for the run that used estimated catches from effort before 1997”.</i></p> <p><i>We agree that the recommendation was, “...as a precautionary approach, that the fishing mortality of shortfin mako sharks should not be increased until more reliable stock assessment results are available for both the northern and southern stocks.”</i></p>
2.2.2 blue shark	<p>2.2.2 a</p> <p>The ‘measures’ in place for blue shark bycatch that are noted in the last assessment, do not qualify as measures for blue shark specifically. This is of concern since the fishery hooks more blue sharks than their target species. Since they are not landing them, the numbers are not captured comprehensively, as in the Spanish longline fleet. When a ‘bycatch’ species is caught in much higher numbers than the target species, there should be clear, enforceable measures to ensure the</p> <p>mortality is kept in precautionary limits. It is not clear this fishery meets the 60 score for 2.2.2a</p> <p>The measures stated in the assessments and audits as ‘in place’ for blue sharks are:</p> <ul style="list-style-type: none"> - non restrictive 250 t allocation - ‘management of excessive discards’ -dockside monitoring -5% rule for shark fins/carcasses -observer coverage <p>250t allocation:</p> <p>The Shark Conservation Action Plan lists a ‘precautionary allocation of 250t’ for blue sharks. This is not an enforced measure, it is just a number that has been chosen without a scientific basis. The estimated mortality of blue sharks in this fishery is well above that at an estimated 495t⁴. It is not clear if the 250t allocation includes all mortality or only for landed blue</p>	<p>Thank you. We note that the MSC defines a partial strategy (i.e., the SG80 requirement) in GCB3.3 (MSC 2013b), and specifies that a partial strategy may not have been designed to manage the impact on that component specifically.</p> <p>In this regard, the report has detailed the approach taken to manage bycatch generally, with some measures that are clearly targeted at sharks in general (e.g., the requirement to use monofilament leaders). The measures in place are considered to meet a partial strategy.</p> <p>We acknowledge and highlight that the fishery catches as much or more blue shark as swordfish. However, as noted in the report, and in your comments here, while there is uncertainty, the most recent assessment of the North Atlantic blue shark stock was undertaken in 2015 (ICCAT 2015bRBS). All scenarios considered with the Bayesian surplus production model and the integrated model indicated that the stock was not overfished ($B_{2013}/B_{MSY} = 1.35-3.45$) and that overfishing was not occurring ($F_{2013}/F_{MSY} = 0.04-0.75$); a similar status was also concluded in the 2008 stock assessment.</p>

Scoring Guidepost	EAC Comments	Assessment team response
	<p>sharks. This will never be applicable for landed blue sharks as this fishery rarely lands them.</p> <p>Management of excessive discards</p> <p>Audit team notes in Year 2:</p> <p>“DFO verbally confirmed that management measures would be implemented to manage excessive discards of blue shark, should they occur. Further, the audit team notes that ICCAT has been more pro-active in recent years on shark conservation.”</p> <p>First, the DFO has no definition of what constitutes ‘excessive discards’ for blue sharks. Second, it not clear how the is DFO going to ‘manage excessive discards of blue sharks, should they occur’.</p> <p>There is still no comprehensive reporting of the amount of shark discards in this fishery, nor of the condition of sharks upon release.</p> <p>ICCAT has yet to define HCRs for blue sharks, however there may be a cap on blue shark catch recommended at the 2016 meeting.</p> <p>Dockside monitoring</p> <p>The measures described as in place for blue shark include hail in and out and dockside monitoring. The dockside monitoring is not an effective way to monitor and enforce blue shark catch and mortality since the species is rarely landed. Only robust monitoring and reporting out on the water will fully capture the impact on blue sharks.</p> <p>5% rule for fins’</p> <p>Please see our comments above on the new fins naturally attached policy that will be in place this year</p> <p>Observer Coverage</p> <p>The concern about the observer coverage and data robustness in this fishery is noted throughout the assessment and audits. Again, please refer to our comments below on the RPA for Incidental Catch. The fishery still has too much data uncertainty to properly manage bycatch and retained species.</p> <p>Though latest ICCAT SCRS blue shark assessments show that blue sharks are not overfished or experiencing overfishing⁵, it also indicates that the assessment is uncertain.</p>	<p>Campana et al. (2015) noted that the persistence of blue sharks to this point is partly attributable to their productivity relative to other sharks species, the fact that few mature females are caught either in Canadian or American waters, and the relatively low overall Canadian contribution to overall population mortality. Also, Campana et al. (2016) looked at post-hooking mortality rates for blue shark, and the overall non-landed fishing mortality of blue sharks captured in the pelagic longline fishery was estimated at 23.1% (95% CI: 16–30%), which was found to be lower than that of porbeagle and mako sharks. Camapana et al. (2015) concluded that, at present, fishing-related sources of mortality of blue shark in Canadian waters appear to be sustainable.</p>

Scoring Guidepost	EAC Comments	Assessment team response
	<p>The SCRS has been under considerable pressure to produce data that can be used for clear management advice for blues and, though, they have produced reports, they stress it should be taken with caution. We must keep in mind that there is pressure from some nations with blue shark fisheries to increase catch.</p> <p>The 2015 SCRS assessment attempted to bring in some new data and work with sensitivity analysis and new modeling. However, ultimately feel that they results are still uncertain:</p> <p>Considerable progress was made on the integration of new data sources (in particular size data) and modeling approaches (in particular model structure). Uncertainty in data inputs and model configuration was explored through sensitivity analysis, which revealed that results were sensitive to structural assumptions of the models. The production models had difficulty fitting the flat or increasing trends in the CPUE series combined with increasing catches. Overall, assessment results are uncertain (e.g. level of absolute abundance varied by an order of magnitude between models with different structures) and should be interpreted with caution. P12</p> <p>For the North Atlantic stock the assessment does state the blue shark is not experiencing overfishing, but again this is combined with heavy caveats about uncertainty and there was no management advice put forward:</p> <p>Based on the scenarios and models explored, the status of the North Atlantic stock is unlikely to be overfished nor subject to overfishing. However, due to the level of uncertainty, the Group could not reach a consensus on a specific management recommendation. Some participants expressed the opinion that fishing mortality should not be increased while others thought this was not necessary. P13⁶</p> <p>EAC notes concerns about impact on blue shark have been in place since the original assessment and were part of our objection to the certification. They continue to be an issue and have not been adequately addressed after 4 years of certification in terms of measures directly targeting blue shark, such as hard limits, area closures, etc.</p> <p>Having no hard limits on catch and no harvest control rules would not happen for a commercially important species in fisheries management today and it is not a precautionary way to manage species, such as sharks that are inherently vulnerable.</p> <p>We do not feel there are sufficient measures in place, nor objective evidence that measures or a partial plan are being successfully implemented. Scoring above 60 needs</p>	

Scoring Guidepost	EAC Comments	Assessment team response
	<p>convincing rationale.</p> <p>This should also be noted in assessing the evidence that the precautionary principle is being applied in P3 scoring.</p> <p>⁴ Campana, S.E., Brading, J. and Joyce, W. (2011). Estimation of Pelagic Shark Bycatch and Associated Mortality in Canadian Atlantic Fisheries. DFO Can. Sci. Advis. Sec. Res. Doc. Available online at: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2011/2011_067-eng.html.</p> <p>⁵ http://iccat.int/Documents/Meetings/Docs/2015_BSH%20ASSESS_REPORT_ENG.pdf</p> <p>⁶ ibid</p>	
2.3.1 SARA loggerhead seas	<p>The DFO official advice to list loggerhead sea turtles under the Species at Risk Act was published in Canada Gazette on August 27th, 2016.⁷ This means loggerhead seas will be officially listed as endangered under Canada's Species at Risk Act by April 2017 at the latest and there will be extra requirements under this law the fishery will need to comply with eventually.</p> <p>⁷ http://www.gazette.gc.ca/rp-pr/p1/2016/2016-08-27/pdf/g1-15035.pdf</p>	<p>Thank you – the recent listing of loggerhead sea turtles under SARA is noted in the introduction, in Section 3.6.3.</p>
2.3.1a	<p>There is no national recover plan for loggerhead sea turtles despite having been assessed as endangered by COSEWIC and have been listed on CITES for years. This is due to a delay in making a decision to list (or not list) the species under the Species at Risk Act and move loggerhead sea into the process for recovery planning.</p> <p>It seems odd that this SI does not get scored when there is lack of a national plan to recover a species under CITES, rather than a condition being applied to ensure movement forward on a national plan.</p> <p>At this point, the loggerhead sea will be listed under SARA shortly and the recovery planning must start thereafter.</p>	<p>Thank you for this comment. We note that any concerns over the MSC requirements should be directed at the MSC, and we certainly encourage stakeholders to participate in the development of the Standard.</p>
2.3.1 b Loggerhead sea	<p>While it is true that the Canadian longline fleet is not the only threat to the recovery of loggerhead sea turtles, their impact must be addressed. Recent research presented by Mike James, DFO Species at Risk, at the February 2016 Incidental Catch RPA has confirmed this fishery has a high risk of interaction with loggerhead sea turtles since the areas used by the</p>	<p>Thank you for your comments, and we agree that inaction with regard to sea turtle interaction is not acceptable. In this regard, though, and as noted in the scoring commentary, we do see the measures in place</p>

Scoring Guidepost	EAC Comments	Assessment team response
	<p>loggerhead seas for feeding overlap with where the fishery sets its gear closely. This fishery does, therefore, have a higher burden to reduce risk to the endangered loggerhead sea that other fisheries.</p> <p>The argument that measures implemented by this fishery will not alone achieve recovery is not an excuse for inaction. As for all migratory species recovery, or shared global issues, the solutions require each country to take responsibility to minimize their threat as much as possible to cumulatively create the conditions for success. The MSC can also help to create incentives for collective action no matter how small the percentage of threat assigned, by requiring clear action - this creates an interested set of fisheries to move of migratory species recovery.</p> <p>As it was in the first assessment, it is still not possible to provide quantitative evidence to confirm the fishery is unlikely to cause unacceptable risk.</p> <p>The fishery was given four years to improve this understanding and it has not.</p> <p>This could have been done proactively through increased detailed data collection on turtles hooked (including area caught, gear used soak time, hooking location, detailed status of turtle, etc) or through video monitoring technology that can be analysed after fishing trips or caps or a number of other options. It was clear from modeling and analysis at the time that the available information was not sufficient. The 2016 effort at analyzing whether observer coverage is effective on this fishery was not using new data collected, rather testing new modeling attempts.</p> <p>The direct effects of this fishery are hindering recovery of loggerhead seas. They may be part of a large suite of threats, however the scoring should reflect the continuing decline and the role this fishery has to contribute to recovery by actually reducing the direct threat of capture.</p> <p>The fishery has not fulfilled the conditions placed on it to achieve an 80 and should be suspended until it has since it has not ‘made adequate progress’ during the first certification period.</p> <p>-the action plan put into place has not been acted upon – all the things they could have done to assess the impact more fully,</p> <p>-note client action plans are not be reliant on management, funding, etc and if it is , management has to sign off and both bear responsibility</p>	<p>in the swordfish longline fishery as being sufficient to meet the SG80 requirements.</p> <p>The recent update to the IUCN status assessment for loggerhead sea turtles (Ceriani & Meylan 2015) provides particularly important information. This latest status assessment now lists loggerhead sea turtle subpopulations individually, rather than simply showing an overall global status for the species. The Northwest Atlantic subpopulation of loggerhead sea turtle is the subpopulation of relevance to the swordfish longline fishery, and this is listed as being ‘Least Concern’, with the available long-term series of annual nest counts (used as an index of population abundance) showing an overall increase over the past three generations.</p> <p>A further recent review of loggerhead sea turtles in the Northwest Atlantic by Chapman & Seminoff (2016) reported that “With the exception of lower totals for 2014 in Georgia and the Carolinas, the last five years appear to have a positive trend in all areas. Florida’s wealth of data show a dip in the loggerhead sea population around the early 2000’s but also a definite rebound in the past decade.”</p> <p>With regard to the observer coverage level, we accept that there will always be some doubt as to what happens in unobserved parts of any fishery. However, it is beyond the remit of the Assessment Team to direct managers as to approaches to address uncertainty, and we note that DFO stated that the coverage was considered to be ‘sufficient’ (DFO 2016d). This was clarified subsequently as being considered sufficient for determining all bycatch.</p>

Scoring Guidepost	EAC Comments	Assessment team response
	<p>-issue of achieving observer coverage due to lack of observers, they knew this to be a problem for years; also this is something over and above they must do to meet standard for eco certification = so get video monitoring.</p> <p>-all sources of mortality, not just death, are supposed to be taken into account according to 1.3, this includes sub lethal effects – rationale?</p> <p>-so close to not passing initial certification and they have not made progress, this was noted as being behind more than a year ago; they have been given the warning and still no proactive work has been started</p> <p>-compared to other fisheries who felt their interaction with the turtles warranted caps on encounters and video monitoring, what is the plausible argument that handling practices will do anything?</p>	
2.3.2	<p>The measures in place referred to for scoring this indicator in the original client assessment are found in the Loggerhead sea Conservation Action Plan. The original assessment notes:</p> <p>“However, as the Loggerhead sea Turtle Conservation Action Plan is newly developed, and is due to be fully implemented for the 2011 season, with respect to loggerhead sea turtles the final scoring issue of the 80SG is not met; there is not yet evidence that the strategy is being implemented successfully.”</p> <p>V 1.3 for this assessment notes that all direct mortality should be considered when evaluating the expected success of the measures and management strategy.</p> <p>As the Ecology Action Centre noted in the original assessment:</p> <p>Measures in place in other countries (including the U.S. Northeast Distant management area immediately adjacent to Canadian waters) that actually aim to minimize mortality include:</p> <ul style="list-style-type: none"> • strict bycatch/interaction limits that shut down the fishery • bait restrictions • depth restrictions • spatial closures geared towards reduction of bycatch • temporal closures geared towards reduction of bycatch • temperature based regulations • meaningful hook restrictions • soak time restrictions 	<p>There are various measures in place in the fishery which are designed specifically to manage and minimise impacts on turtles (e.g, the use of circle hooks, the use of shallow-sets, the requirement to be trained in and carry dehooking equipment, etc), and the Assessment Team is confident these allow the fishery to achieve SG80 for PI 2.3.2. Further work and efforts could certainly be considered, and a Recommendation has been made that the turtle mortality study is completed, but we contend that this would move the fishery towards SG100, rather than being a requirement at SG80.</p> <p>As noted in the Year 4 audit report (Knapman et al. 2017), we disagree that the Conditions have not been met, and highlight the latest loggerhead sea turtle status assessment (Ceriani & Meylan 2015), which now lists loggerhead sea turtle subpopulations individually, rather than simply showing an overall global status for the species. The Northwest Atlantic subpopulation of loggerhead sea turtle is the subpopulation of relevance to the swordfish longline fishery, and this is listed as</p>

Scoring Guidepost	EAC Comments	Assessment team response
	<ul style="list-style-type: none"> incentives for changing fishing gears <p>There is no evidence that these practices have been considered, and no justification for reasons they have not been considered. Furthermore, without meaningful catch data from the fishery (provided by comprehensive observer coverage) it is not possible to determine what measures would be necessary to minimize mortality.</p> <p>This was in 2011, since then other fisheries have implemented other measures. We urge the assessment team to include a comparison with other similar fisheries when scoring 2.3.2b</p> <p>Five years later, the client fishery has made one change to fishing practices in their licence conditions – shifting from voluntary to mandatory handling and release training, but has not yet presented evidence on the impact of this measure.</p> <p>There have been no other fishery practice changes introduced that we are aware of to reduce encounters with sea turtles, despite options available.</p> <p>Another way to assess if there is an objective basis for confidence the strategy will work is to assess the implementation of the LCAP, expected in 2011. The assessment also states that if the LCAP measures are implemented they anticipate a reduction in loggerhead sea turtle encounters in the client fleet. Is this the case?</p> <p>It is now 2016 and the LCAP has still not been fully implemented or updated with new action plans since the 2011/2012 objectives. The ‘objective confidence’ need for a score of 80 that it would work is supposed to come from the implementation evidence after 2011 evaluation. This was based on assurances given by the client and signed off by management. The plan also represents Canada’s commitment to the global recovery.</p> <p>In fact, the many key LCAP objectives remain unfulfilled (see below) If we cannot look at past performance for assessing ability and willingness to implement, what can we look at?</p> <p>The fishery has not fulfilled the conditions placed on it to achieve an 80 and should be suspended until it has since it has not ‘made adequate progress’ during the first certification period.</p> <p>The SARA recovery plan for loggerhead seas will take a year at least to be completed and may compel stronger measures to be implemented. However, giving the client a further 4 years of certification while that plan is awaited, is merely moving the goalposts and not assessing the progress made during their first certification period.</p>	<p>being ‘Least Concern’, with the available long-term series of annual nest counts (used as an index of population abundance) showing an overall increase over the past three generations.</p>

Scoring Guidepost	EAC Comments	Assessment team response
	<p>However, the assessment team can look at other longline fisheries who have high interactions with loggerhead seas to compare this fisheries mitigation efforts.</p> <p>Even when the full understanding is still out of reach the client could have proactively implemented measures that are in place in other fisheries to ensure that their impact is not 'unacceptable'</p>	
Loggerhead sea management plan 2.3.2	<p>The Gully MPA is noted in 2.3.3 as a management measure for loggerhead sea turtles. This area is not identified as a hotspot for loggerhead seas.</p> <p>Otherwise the management strategy in question is the LCAP. The re - assessment should provide specific evidence of how parts of the LCAP have been implemented and whether the evidence shows a basis for confidence. At the moment, the audit report only includes a checklist of what is underway without assessing the impact of those actions.</p> <p>We do not agree that the fishery can score 80 for this partial strategy since as we commented above there is not solid basis for arguing this plan will minimize mortality nor that this plan will be successfully implemented. The fishery has already shown that the have not made adequate progress on the conditions previously given for the guidepost and certification should be suspended.</p> <p>Since progress on the LCAP has not been presented to the Atlantic Large Pelagics Advisory Committee for review or updates, the Ecology Action Centre has a few queries about items noted as completed, though we urge the assessment team to review the LCAP thoroughly:</p> <p>1.d Review the Observer contract requirements and identify necessary amendments or additions to institute improved data collection requirements.</p> <p>What amendments were made? Do they correspond to the data collection noted in James 2015 from the Incidental Catch RPA that would be most useful for assessing impact on loggerhead seas?</p> <p>3.a Move to mandatory 16/0 circle hooks to reduce mortality of loggerhead sea turtles</p> <p>Is there a science basis for 16/0 over 18/0 as reducing sea turtle hooking? Has there been reduced hooking since 2011? And is the data reliable?</p> <p>3.d Assess feasibility and potential effectiveness dynamic/temporary, time/area, temperature-based closures to minimize loggerhead sea turtle interactions.</p>	<p>Noted, and we agree the Gully MPA is not a management measure for loggerhead sea turtles.</p> <p>Other comments are as in the note above, and in the full scoring comments of the report.</p>

Scoring Guidepost	EAC Comments	Assessment team response
	<p>Has this analysis been done and documented somewhere? Mike James presented at the Incidental Catch RPA identified hotspots.</p> <p>3.e Possible changes to gear configuration and fishing practices based on results of research.</p> <p>This is the most meaningful measure the LCAP suggests, however there has been no work that we are aware of on this, nor any proposals put forward by the client to the advisory committee to invest in research or change practices, nor any timelines introduced to ensure this eventually is accomplished.</p> <p>4. Research in support of Strategies</p> <p>Some of this has been researched, however many of the objective of LCAP section 4 have yet to be pursued.</p>	
Loggerhead sea Turtle Conditions 6&8	<p>The final milestones for these conditions have not been met and the conditions should not be closed. The fishery has failed to make adequate progress on these conditions during their first certification and they should not be granted a new certification.</p> <p>Please refer to our detailed comments about progress on Conditions 6 and 8 submitted to the assessment team for the final audit of this fishery.</p>	<p>Thank you. We note that a complaint was submitted to Acoura regarding the closing of the conditions for the year 4 audit (Knapman et al. 2017). This was responded to, but in summary the Assessment Team felt the existing information, together with new information on the status of the Northwest Atlantic subpopulations of loggerhead sea turtle, provided clear justification for closing the conditions.</p>
Incidental Catch RPA (Feb 2016)	<p>Many of the condition milestones for bycatch species rely heavily on the outcome of the Incidental Catch RPA that was held in February 2016. The audit team of Year 3 anticipated possible scoring changes based on the outcome of the RPA that would show improved confidence in the current observer coverage scheme in place for the fishery.</p> <p>Please refer to our detailed comments about the Incidental Catch RPA submitted to the assessment for the final audit of this fishery.</p>	<p>Thank you - noted, but we do not agree that the milestones for bycatch species conditions rely heavily on the Incidental Catch RPA. We responded to similar comments in detail in the audit report (Knapman et al. 2017).</p>

Appendix 5: : Stakeholder submissions – new information

Acoura Marine Ltd. invited stakeholders to submit new information on the swordfish longline fishery on June 9th 2017 (<https://fisheries.msc.org/en/fisheries/north-west-atlantic-canada-longline-swordfish/@@assessments>). In response, only the EAC submitted a letter, included on the following pages.

The Assessment Team notes that the new information consultation is an opportunity for stakeholders to submit new information relating to the fishery that the team should consider in the assessment of the fishery (7.3.4, MSC 2014). In this regard, rather than being ‘new information’, the EAC letter essentially comprises a restatement of the EAC’s position on the Canadian longline swordfish fishery’s interaction with turtles, and appears to be a response to the Assessment Team’s response to the complaint that was submitted by the EAC on the recent year 4 audit of the fishery⁶. As such, we have not provided a detailed response to each of the points made.

Nevertheless, we thank the EAC for the comments, which we have taken in to consideration in drafting this report.

⁶ <https://fisheries.msc.org/en/fisheries/north-west-atlantic-canada-longline-swordfish/@@assessments>



Ecology Action Centre

tel. 902.429.2202 2705 Fern Lane,
fax. 902.405.3716 Halifax, NS, B3K 4L3

Billy Hynes
MSC Fisheries Manager
Acoura Fisheries
fisheries@acoura.com

July 9th, 2017

RE: Extended comment period for North West Atlantic Swordfish Longline fishery re-assessment

The Ecology Action Centre has been a consistent stakeholder in the MSC certification of the NW Atlantic Swordfish Longline fishery since 2009 as well as a member of the fishery advisory committee for almost 10 years. We are submitting new information for consideration of the assessment team during this extended 30-day comment period. Should the North West Atlantic Longline Swordfish fishery be recommended for certification and a new PCDR released, we will also be commenting on the scoring rationale presented there.

PI 1.2.2 - Harvest Control Rules

This condition was, in our reading of MSC Guidance, closed prematurely. While, ICCAT is working to develop HCRs for North Atlantic swordfish and have adhered to a recovery plan in the past, the fact is, there are not yet HCRs in place for this fishery. New MSC Guidance on exceptional circumstances as they related to RFMO managed fisheries would allow extension of this condition.

The EAC does not necessarily agree that an extension and new certificate should be granted, however, closing it on the assumption that HCR rules will be put into place according to ICCAT's stated timeline is at the minimum premature. It should not be closed until the HCR rules are in place and there is evidence of implementation. To do otherwise, sets a precedent for other RFMO fisheries that have yet to adopt HCRs and lowers the MSC Standard.

PI 2.3.1, 2.3.2, 2.3.3 – ETP Species

Loggerhead sea turtles (*Caretta caretta*) were listed as endangered under Canada's Species at Risk Act (SARA) as of May 2017.¹ This Canadian national legislation and its

¹ http://www.registrelep-sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=1090





tel. 902.429.2202 2705 Fern Lane,
fax. 902.405.3716 Halifax, NS, B3K 4L3

accompanying policies and documents should now form the basis for loggerhead inclusion and analysis under the MSC scheme.

A recovery plan is expected to be completed in 2017 with required actions to address threats. For aquatic species, SARA recovery strategies require the inclusion of a threat assessment based on Fisheries and Oceans Canada's (DFO's) Guidance on Assessing Threats, Ecological Risk and Ecological Impacts for Species at Risk (DFO 2014a).²

DFO has released a new *Threat Assessment for Loggerhead Sea Turtle (Caretta caretta), North West Atlantic Population* that the EAC submits to Acoura for inclusion and reference in the re-assessment of the North West Atlantic Longline Swordfish fishery.³

It is abundantly clear from this document that there is still limited data and understanding of loggerhead sea turtles in Canadian waters and in the wider population. It is important to continue collecting information as well as to move ahead on implementing mitigation measures that will reduce mortality. Action and cooperation by the NW Atlantic Swordfish Longline fishery are imperative to make progress in supporting the recovery of this species.

DFO's Threat Assessment document identifies this fishery as the only threat with documented mortalities in Atlantic Canadian waters. This reinforces information that has been known and discussed for at least a decade. It is hindering the recovery of the loggerhead not to have vigorously pursued needed information and changes through this fleet during the last decade. The long-life span and patchy occurrence of loggerhead sea turtles in Atlantic Canadian waters means consistent and long term data must be collected and analysed. One or two seasons of elevated observer coverage 2001-2002 cited by Acoura is now over 15 years old and is not providing enough information.

The DFO Threat Assessment is much more clear than previous assessments that while there are numerous threats to the recovery of loggerhead sea turtles in the North West Atlantic, the threat posed by the Canadian longline swordfish fishery should not be ignored:

Canadian recovery measures alone will not recover the Northwest Atlantic population of Loggerhead Sea Turtles; recovery requires international collaboration. However, recovery efforts within Canada **are needed** to increase survivorship of juveniles that occur in Atlantic Canada into the reproductive

² DFO. 2014a. Guidance on Assessing Threats, Ecological Risk and Ecological Impacts for Species at Risk. DFO Can. Sci. Adv. Sec. Sci. Adv. Rep. 2014/013.

³ http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2017/2017_014-eng.pdf





tel. 902.429.2202 2705 Fern Lane,
fax. 902.405.3716 Halifax, NS, B3K 4L3

stage; which would contribute to the recovery of this population.(emphasis added)⁴

PI 2.3.1

It is clear from the DFO Threat Assessment and the literature referred to therein and elsewhere, that while the NW Atlantic swordfish longline fishery is not sole cause of the endangered status of loggerhead sea turtles in the North West Atlantic - this fishery is part of the reason this species has declined and bycatch impact from this fishery needs to be further addressed.⁵

The population for the NW Atlantic is still uncertain and the DFO Threat Assessment notes that the nest numbers from Florida used in the latest IUCN status assessment may be showing an increase, however there is uncertainty in this estimate and more years of data are needed to determine trends. The DFO report also notes IUCN data does not include Caribbean nesting beaches or the possible overlap with turtles from the North East Atlantic population. It is also important to note there is not enough data to assess 3 generations of loggerhead sea turtles and the IUCN status report must rely on a data timeline starting in the mid 1990s, when conservation efforts started. While the IUCN report is important, SARA, as national legislation, and related documents should be given more weight than the IUCN non-binding assessments.

It is not clear the impact of this fishery on loggerheads are within national limits as required by scoring level 60 of 2.3.1. Requirement and acceptable limits for this species are still to be defined under SARA. While it appears a Permit to Harm for loggerhead sea turtles is in the new fishery Licence Conditions, the EAC will be questioning the validity of the process undertaken to grant this even before the species was fully listed under SARA. These are granted under SARA and there are a number of requirements a fishery must show to receive a permit. This permit is not yet published on the SARA registry, nor has there been a process explaining how the fishery has qualified for this even before a Recovery Plan has been written.

The current knowledge about the effects of this this fishery is highly uncertain:

Catch data used to calculate mortalities from the pelagic longline fishery in Canada is outdated (2002-2008) and is based on rates of post-hooking mortality (20-45%) that may also be outdated.⁶

⁴ http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2017/2017_014-eng.pdf, p26.

⁵ http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2017/2017_014-eng.pdf, p2

⁶ http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2017/2017_014-eng.pdf, p24.





tel. 902.429.2202 2705 Fern Lane,
fax. 902.405.3716 Halifax, NS, B3K 4L3

In the 4th Surveillance Audit for this fishery, Acoura is relying on a few key pieces of information to determine the fishery meets the 80 score. The number of adult equivalencies estimated to die is heavily relied on. First, to clarify, the estimated incidental catch rate referred to in the 2010 loggerhead sea turtle Recovery Potential Assessment was 1200 **annually**, not for the period between 2002 – 2008 as noted by Moody in the original assessment. This catch rate is in turn estimated to cause 200-500 loggerhead deaths annually, those are primarily assumed to be juveniles as that is the life stage that most likely occurs in Canadian waters. These estimated deaths are then converted into adult equivalents:

This equates to 5 – 15 adult female equivalent mortalities of oceanic juveniles or 47 – 118 nesting female equivalents of neritic juveniles (range of 5 – 118 nesting female equivalent mortalities) using the relative reproductive value (RRV) for oceanic juveniles presented in NMFS-USFWS (2008a).⁷

Note, the number range used in the Threat Assessment is between 5-118 nesting female equivalents.

There are two important concerns about overly relying on this particular data point to conclude the direct effects are highly unlikely to create unacceptable impacts to the ETP species. First, this original estimate is based on a paucity of observer data that was not considered fully reliable at the time (this is discussed in the original paper by Brazner and McMillan)⁸. The extrapolation method did not account for tuna vs swordfish directed trips nor look fully into spatial and temporal coverage. While it is the best estimate we have, it is acknowledged that it is uncertain and, therefore, should be built upon with caution. The 2010 COSEWIC assessment notes:

Difficulties in matching data from the IOP and total landings databases (e.g., estimated vs. actual weights, missing values) introduced bias into estimates of Loggerhead Sea Turtle bycatch; hence, bycatch estimates should be considered minimum numbers, with actual bycatch potentially considerably higher.⁹

The method used to create a number of female nesting equivalencies is also uncertain and is best guess.

⁷ http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2017/2017_014-eng.pdf, p9.

⁸ Brazner, J.C., and J. McMillan. 2008. Loggerhead turtle (*Caretta caretta*) bycatch in Canadian pelagic longline fisheries: relative importance in the western north Atlantic and opportunities for mitigation. Fisheries Research 91:310-324.

⁹ http://www.registrelep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr%5FLoggerhead%20Sea%20Turtle%5F0810%5Fe%2Epdf, p29





tel. 902.429.2202 2705 Fern Lane,
fax. 902.405.3716 Halifax, NS, B3K 4L3

Second, the DFO Threat Assessment makes it clear that deaths of juveniles in this fishery cannot be discounted as an insignificant impact on loggerhead recovery:

Likewise, threats in Canada can affect the number of Loggerhead Sea Turtles that survive to reproductive ages, thereby influencing the recovery of the population. Studies referenced in COSEWIC (2010) suggest that improving the survival of juvenile Loggerhead Sea Turtles would be more effective in maintaining the population than earlier life stages, because the reproductive value of juveniles as they transition into adulthood is higher....

Canadian recovery measures alone will not recover the Northwest Atlantic population of Loggerhead Sea Turtles; recovery requires international collaboration. However, recovery efforts within Canada are needed to increase survivorship of juveniles that occur in Atlantic Canada into the reproductive stage; which would contribute to the recovery of this population. As the COSEWIC assessment states: "Bycatch of juvenile-stage turtles is particularly significant because changes in survivorship of this life-history stage have the largest impact on population growth" (COSEWIC 2010). This is especially true for larger juveniles that are present in Atlantic Canadian waters, as they have a higher reproductive value than smaller juveniles. Therefore, mitigations in Atlantic Canada to reduce bycatch and post-release mortality are important for the recovery of the population. In addition, juvenile survival in Atlantic Canada may also affect the Northeast Atlantic population of Loggerhead Sea Turtles, as it is possible that the two populations mix in Atlantic Canadian waters.¹⁰

The 2010 COSEWIC assessment also stresses the importance of addressing mortality on juvenile loggerhead sea turtles:

Juvenile Loggerhead Sea Turtles have the highest reproductive value to the species (Crowder *et al.* 1994). Mansfield *et al.* (2009) note that "localized sources of mortality affecting juvenile loggerheads will ultimately translate to population impacts among all USA loggerhead subpopulations." Crowder (2000) and Lewison *et al.* (2004) discuss the responsibility of nations whose pelagic longline fisheries, like Canada's, take Loggerhead Sea Turtles as bycatch; they state, "the basin-wide distributions of both pelagic longline effort and sea turtles...suggest that effective protection for loggerheads and leatherbacks will require coordinated international action." The importance of conserving the population of Loggerhead Sea Turtles found in Atlantic Canadian waters should not be underestimated.¹¹

¹⁰ http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2017/2017_014-eng.pdf, p3, p26.

¹¹ http://www.registrelep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr%5FLoggerhead%20Sea%20Turtle%5F0810%5Fe%2Epdf, p35





tel. 902.429.2202 2705 Fern Lane,
fax. 902.405.3716 Halifax, NS, B3K 4L3

Just focusing on adult female equivalencies is not including the full impact of the fishery threat. We do not agree with this justification used by Acoura to argue that the fishery impacts are known and likely to be acceptable.

Acoura also relies on their analysis that the observer coverage in the fishery is sufficient to justify the new score of 80. It is made clear in the DFO Threat Assessment document that there is still a paucity of data available about the fishery interactions. The EAC objected to the fishery passing the 60 scoring for this at the original assessment and still hold that there has not been significant change in the amount of information available through observer coverage for this fishery. The original assessment imposed conditions to ensure that the observer coverage was analysed for its suitability to present a representative sample across space and time of the fishery as well as between setting for tuna or swordfish. This analysis has still not been complete. Indeed, the DFO agreed that this was also a priority, setting two Regional Assessment Processes – in 2011 and 2016 – neither process was able to come to a conclusion – there is still no answer mainly due to patchy data available for analysis and a disagreement about the proper method to use to try to interpret the little data that exists.

The 2017 DFO Threat Assessment Report for loggerhead sea turtles still directly recommends this same action:

In the short term, a new analysis of observer data would be useful to recalculate annual incidental capture and mortality of Loggerhead Sea Turtles in Atlantic Canadian waters, taking into account the change from J-hooks to circle-hooks and the varying levels of observer coverage depending on the target species (tropical tunas vs. swordfish) given additional data sources.¹²

Acoura notes in the 4th Year Surveillance Audit they feel this analysis is no longer needed as there is now randomized observer coverage and the observer coverage has meet the minimum 5% for the last number of years. These two points do not answer the original uncertainty about bycatch information in this fishery. This new randomized observer coverage has not been analysed for evidence that it is providing the needed information.

Acoura also refers to a verbal statement from the minutes of the 2015 ALPAC meeting by a DFO fishery manager that the observer coverage is considered 'sufficient'. First, this comment was not concerning the full representative nature of the coverage, but rather the percentage and it was referring to the 2015 fishing season. Second, this verbal comment does not explain then why the DFO went forward with the Regional Assessment Process to look at the observer coverage and incidental capture in this

¹² http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2017/2017_014-eng.pdf, p25





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fishery in 2016. Third, under the new National Catch Monitoring Policy risk assessment process underway this fishery has once again been identified as high risk and will be required to improve their catch monitoring (our source for this is verbal communication with DFO managers, similar to Acoura's sourcing, and will be published soon in policy).

The lead DFO scientist for loggerhead sea turtles notes in the RPA 2016 proceedings that information about the hooking location and state of the animal is vital to understanding post release mortality and potential mitigation measures and could be collected by the fishery. If the fishery had been collecting even this little information over the last 5 years of the MSC certification period, it would have been a big improvement on information and understanding of the fishery impact and possible mitigation measures. Unfortunately, the fishery did not make an attempt to reduce the knowledge gap and collect needed information.¹³

Acoura also refers to a Javitech report on loggerhead catch from the 2001-2002 fishing seasons as evidence that most turtles are released alive and uninjured. It must be noted that this is not a peer reviewed document and is not reflective of the type of long term trend that is needed to assess sea turtle interaction and release state. The incidents of sea turtle capture are not evenly spread out over the fishing season, the fleet, and they vary annually depending on a number of ocean conditions and fishing practices. Also, it has been noted by DFO science that the observer data on loggerheads collected at that time did not capture the necessary detail to ascertain hooking location and health of the turtle properly, hence the need for observer training and a proper post-mortality study (pers comm Mike James 2012).

It cannot be argued that the observer coverage and information being collected about loggerhead sea turtles and other bycatch species is yet sufficient to properly understand the impacts and necessary steps or this would not be repeated over and over in loggerhead assessment documents as a key need.

The fishery should not pass the 60 for this scoring post and, certainly, is not demonstrating 'global best practice' needed for 80.

PI 2.3.2

¹³ DFO (2016d). Proceedings of the regional peer review assessment of incidental catch in the Atlantic Canadian swordfish/other tuna longline fishery. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2016/nnn.



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The Ecology Action Centre maintains that this PI was rescored to 80 without valid justification. The original assessment condition relied on the Loggerhead Conservation Action Plan (LCAP) as the 'strategy' in place for managing impacts of the fishery.

The LCAP has not been updated since 2012. We have submitted evidence before to show that many of the actions – and specifically the actions that could minimize mortality – have never been completed. The Ecosystem Working Group of ALPAC that was supposed to aid in overseeing such plans, only met once and has since been defunct.

The condition was closed in Year 3 also in anticipation of the RAP on incidental catch and observer coverage planned for this fishery in 2016. As noted above, the process was inconclusive and DFO's newest documents once again recommend such analysis be undertaken.

There is no evidence that any fulsome strategy is in place and working to mitigate turtle catch and mortality. While it is good that the turtle handling and release training and kits is now mandatory, there is no evidence to show the effectiveness of this measure yet - there has been no concerted effort to document use, assess if the gear is suitable for the fishery, and record detailed capture and release data. Even the limited mortality mitigation measures recommended, specifically those related to bait and soak time, in the 2010 Recovery Potential Assessment document have not been fully studied or implemented seven years later.¹⁴

PI 2.3.3.

Relevant information for this scoring indicator is also included above for PI 2.3.1, please refer to the detail there also.

It cannot be concluded that there is clear information to determine the ongoing threat of this fishery to the loggerhead sea turtle population.

As noted above, the DFO Threat Assessment clearly states that though the fishery is not the sole reason the species is endangered it plays a role and that role should be addressed. The juvenile deaths are considered significant and need to be reduced.

As Acoura states in the 4th Surveillance Audit, it cannot be confirmed that the observer coverage is representative. This is the crux of the scoring and it really cannot be argued that there has been progress on this analysis and understanding. While the fishery may have mostly met their seasonal 5 % targets, the newly randomized observer coverage protocol Acoura relies on in their scoring justification has yet to be analysed to see if it is

¹⁴ <http://waves-vagues.dfo-mpo.gc.ca/Library/341241.pdf>





tel. 902.429.2202 2705 Fern Lane,
fax. 902.405.3716 Halifax, NS, B3K 4L3

collecting sufficient information to assess risk to ETP species. Acoura references a DFO 'analysis of observer coverage levels' in the 4th Surveillance Audit from a source called 'Provisional observer coverage estimates for swordfish longline 2011-2015' — to our knowledge is just an overview of the percentage of cover per year. It is not new information. This information is presented at ALPAC every year - it is not an analysis of spatial and temporal coverage.

The ongoing loggerhead tagging study is important to increase post-release mortality understanding, but not sufficient to answer the broader questions about interactions with ETP species and this fishery.

Now that the loggerhead sea turtles in listed under SARA there needs to be a completed Recovery Plan and declaration of Critical Habitat along with related action plans - this has yet to be finished.

Overall, for the scoring indicators 2.3.1, 2.3.2, 2.3.3 pertaining to loggerhead sea turtles, the EAC strongly disagrees that this fishery should receive a score of 80 signifying 'global best practice'. We also do not think the justification given for closing outstanding conditions of certification at the 3rd and 4th audit related to loggerhead sea turtles was sufficient. The fishery did not fulfill its milestones and conditions of certification during the 5-year period of certification and should not be rewarded with a second certification period.

If we look at the key actions the fishery has implemented since the initial MSC assessment of 2011-2012 to address their impact on loggerhead sea turtles, it includes switching to corrodible circle hooks, making the loggerhead handling and release guidelines and training mandatory – though these measures were already named as in place in 2010 and 2012 respectively - and a handful of the fleet boats have allowed researchers on board to undertaking a tagging study.

Currently our information about loggerhead sea turtles and the impact of fishing on them in Canadian waters, is almost entirely dependent on this fleet. Loggerhead sea turtles use Canadian waters for a portion of their lifecycle and their presence and interaction with the fleet is dependent from year to year on a number of factors. Consistent and long term data collection across the fleet is needed to ensure we have robust information to support the recovery of this endangered animal. A significant amount of data and work could have been done by this fishery to contribute to this over the last 5 years of MSC certification that was not done.



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Instead we are still seeing Canadian assessments and reports on this endangered sea turtle coming out with the same recommendations and data limitations as over a decade ago. The fishery has not demonstrated willingness to change this. It is against the Precautionary Principle to delay implementation of further mitigation measures that are actually the global best practice due to lack of data. We have enumerated these options in other submissions – they include interaction limits, move away protocol, video monitoring, measures for gangion length and soak time, measures related to gear setting and temperature, measures related to tuna target sets, etc. There is also viable alternative gear that many of this fleet hold a licence for also – harpoon for swordfish or troll for tuna (during the setting for which it is believed the majority of turtles are hooked) – shift more catch to this gear would definitely mitigate mortality for sea turtles. If the fishery was being scored under the Version 2.0 of the MSC Standard they would at the least need to assess each possible mitigation strategy and rationale for not implementing.

While, Acoura states that it does not look at other fisheries to compare action plans, it is worth noting that other pelagic longline fisheries both MSC certified and not have now far exceeded this fishery in terms of mitigation measures taken to address the bycatch associated with this gear type. It is also worth noting, that other MSC certified fisheries in Canada such as the lobster fishery or the halibut fishery have undertaken significant changes to their gear and fishing practices to limit their impact on ETP species and the relative bycatch of these fisheries is far lower than the pelagic longline fishery for swordfish. The MSC label is supposed to signify a fishery has implemented 'global best practice', not just the minimum a national regulator may require.

It is not acceptable to certify a fishery that has been identified as the main threat to an Endangered species without requiring changes in fishing practice on the water.

Thank you for accepting these comments to the continuing re-assessment process for the NW Atlantic Longline Swordfish Fishery.

Sincerely,

A handwritten signature in dark ink, appearing to read "Shannon Arnold".

Shannon Arnold
Marine Policy Coordinator
Ecology Action Centre

Appendix 6: Surveillance Frequency

1. The report shall include a rationale for any reduction from the default surveillance level following FCR 7.23.4 in Table 4.1.
2. The report shall include a rationale for any deviations from carrying out the surveillance audit before or after the anniversary date of certification in Table 4.2
3. The report shall include a completed fishery surveillance program in Table 4.3.

Table 22: Surveillance level rationale

Year	Surveillance activity	Number of auditors	Rationale
e.g.3	e.g. On-site audit	e.g. 1 auditor on-site with remote support from 1 auditor	e.g. From client action plan it can be deduced that information needed to verify progress towards conditions 1.2.1, 2.2.3 and 3.2.3 can be provided remotely in year 3. Considering that milestones indicate that most conditions will be closed out in year 3, the CAB proposes to have an on-site audit with 1 auditor on-site with remote support – this is to ensure that all information is collected and because the information can be provided remotely.

Table 23: Timing of surveillance audit

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
e.g. 1	e.g. May 2014	e.g. July 2014	e.g. Scientific advice to be released in June 2014, proposal to postpone audit to include findings of scientific advice

Table 24: Fishery surveillance programme

Surveillance Level	Year 1	Year 2	Year 3	Year 4
e.g. Level 5	e.g. On-site surveillance audit	e.g. On-site surveillance audit	e.g. On-site surveillance audit	e.g. On-site surveillance audit & re-certification site visit

Appendix 7: Objections Process

(REQUIRED FOR THE PCR IN ASSESSMENTS WHERE AN OBJECTION WAS RAISED
AND ACCEPTED BY AN INDEPENDENT ADJUDICATOR)

The report shall include all written decisions arising from an objection.

(Reference: FCR 7.19.1)