

Canada's Swordfish Fishery Management Plan: 2015

ICCAT Recommendation 11-02 requires each Contracting Party, and Cooperating non-Contracting Party, Entity or Fishing Entity to annually submit to the Secretariat by September 15, its swordfish development or fishing/management plan. This document describes the history, management, socio-economic and future aspirations of the Canadian North Atlantic Swordfish fishery.

Executive Summary

Canada's history of fishing North Atlantic swordfish dates back to the 1880s. Today, this fishery continues to be socially and economically important to communities throughout Atlantic Canada.

Canada's 2015 initial allocation of North Atlantic swordfish was 1,348 metric tonnes; of which 90% was allocated to its longline fleet targeting North Atlantic swordfish, and the remaining 10% to its harpoon fleet targeting North Atlantic swordfish. Canada's offshore tuna fleet is also allocated 5t for swordfish bycatch. There is no recreational or sportfish component to this fishery.

Canada's capacity to harvest its quota share is well documented. Average annual landings have totalled 101% of Canada's annual allocations since 2011. Since 2007, Canada has been allocated 8.8% of the total ICCAT quota. Nevertheless, as the recipient of quota transfers, Canada has accounted for approximately 12% of all North Atlantic swordfish harvested over the past 5 years.

In fact, the Canadian fleet, which has been reduced significantly over the years in order to respect ICCAT quotas, is only able to harvest during a 3-month season before exhausting its quota share despite North Atlantic swordfish being present in significant numbers in Canadian waters throughout the year.

As the foundation for reliable research and stock assessments, Canada collects, among other things, catch and effort data for all fishing trips. Beginning in 1996, an industry-funded Dockside Monitoring Program (DMP) was instituted in Atlantic Canada to provide independent third party verification of logbook submissions.

Canada's DMP is conducted by certified agents who oversee all offloads of swordfish in Atlantic Canada as well as enter logbook data into a central database. The DMP ensures that precise and reliable information is collected on the number of fish caught, their weight, effort, environmental conditions, and other vital statistics. This data is available in real-time to fisheries managers, scientists, and enforcement officers. Due to the requirement for all logbook data to be uploaded prior to the commencement of their next fishing trip, Canada has 100% logbook coverage for its fleets targeting North Atlantic swordfish.

Canada's comprehensive approach to enforcement also includes the requirement for VMS on all longline vessels, despite only a few of Canada's 77 pelagic longline vessels being over 20 meters in length and thus subject to ICCAT's VMS measure. The Conservation and Protection Program of DFO fly approximately 300 aerial surveillance flights a year in areas where swordfish fishing activities are occurring. Also, Fishery Officers inspected 5 Swordfish buying/processing facilities and conducted audits of the Dockside Monitoring Program in this fishery. At-sea observers are targeted for deployment on 5% - 10% of swordfish fishing trips despite no ICCAT requirements for observers onboard swordfish vessels smaller than 20 meters.

As of 2012, in recognition of the strong management regime which is in place for these fisheries in Canada, both the longline and harpoon fleets targeting North Atlantic swordfish have been awarded Marine Stewardship Council certification. Canada is the first ICCAT member to obtain this certification for its entire swordfish fleet.

1. Overview of the fishery

Canada has a strong management regime which ensures that the fishery is sustainable, strictly monitored and controlled. **As of 2012, the entire Canadian swordfish fishery is Marine Stewardship Council certified.** Canada is the first ICCAT member to obtain this certification for its entire swordfish fleet.

Key management elements include:

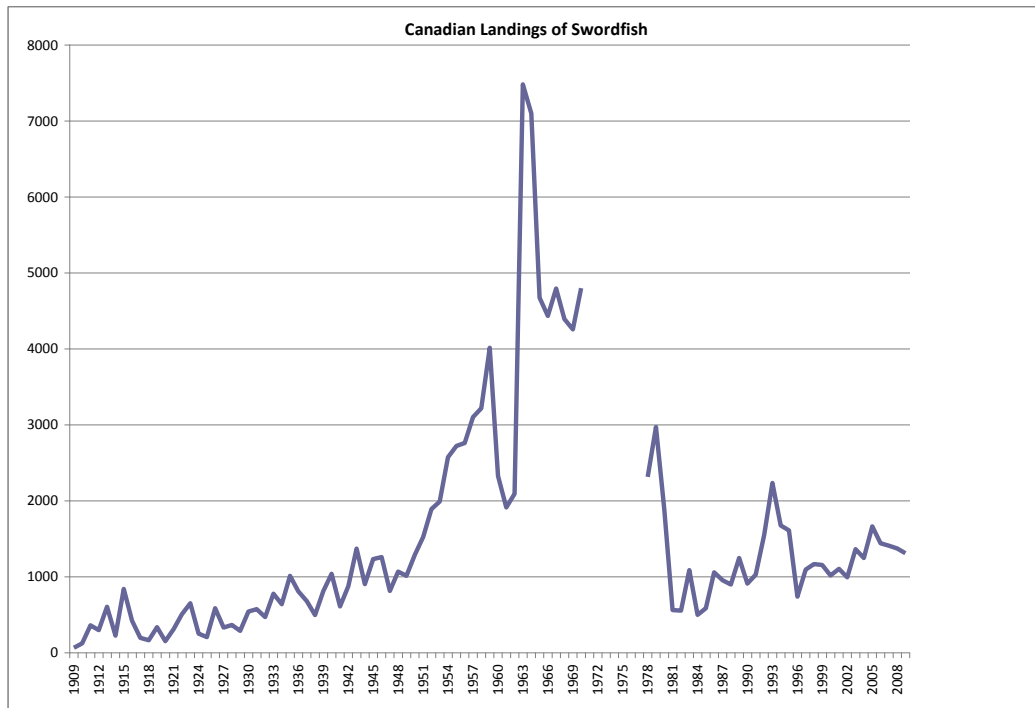
- Effort controls that match availability of fish
- Limitations in the number of authorized licenses
- Gear restrictions
- Targeted time and area closures
- Minimum size limits to protect juvenile fish
- Stringent reporting requirements
- Effective quota management regime

1.1 History – *Description of the catch history and socio-economic importance of the Swordfish fishery, participation in science, etc.*

Canada's Atlantic swordfish fishery began in the late 1880s as harpoon vessels fished throughout Atlantic Canada, and eventually expanded their fishery along the annual migration patterns of the eastern seaboard of North America. In the early 1960s, our fishery shifted from a harpoon to a primarily longline fishery, and landings increased to a high of approximately 7,000t. Recorded landings decreased sharply in the 1970s as a result of import measures, which affected the ability of Canadian harvesters to market their product. Over the last decade, annual landings have remained relatively stable.

The importance of the fishery to Canada is highlighted in **Figure 1**, which shows Canada's landings dating back to 1909.

Figure 1



The first ICCAT measures were put in place for the North Atlantic swordfish stock in 1991. Minimum sizes were also put in place at that time. In response, Canada implemented domestic measures to limit the harvesting of undersized swordfish, and introduced a limited-entry fishery in 1992.

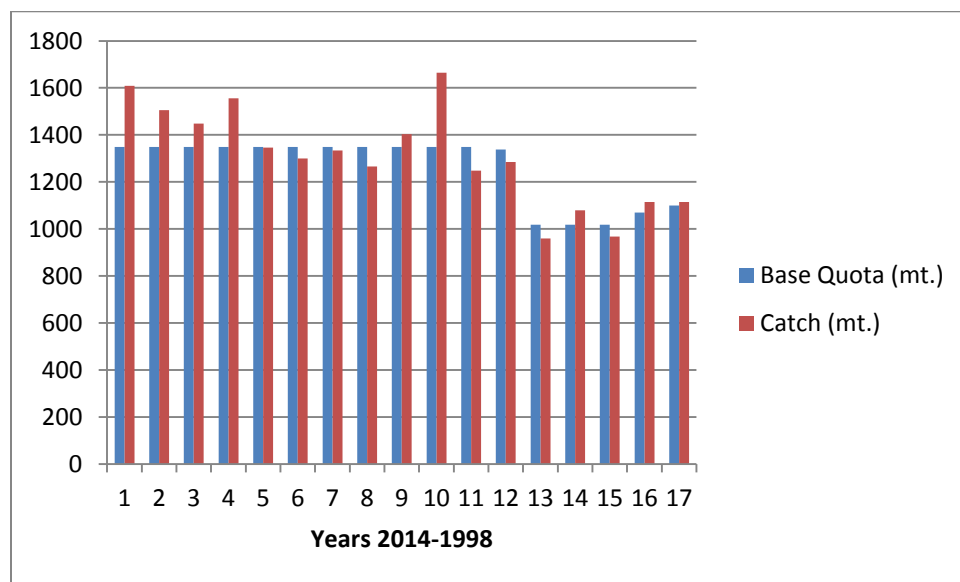
Between 1995 and 2000, further reductions in the Canadian quota on an annual basis resulted in the need for significant changes to the domestic swordfish management strategy, including fleet allocations to each of the harpoon and swordfish longline fleets. These measures were further refined in 2002 with the introduction of Individual Transferable Quotas (ITQs) in the longline fleet and in the harpoon fleet in 2011, which has eliminated the competitive nature of the fishery and provided the fleet with a mechanism to self-rationalize.

1.2 Current fishery - general information on where, when, how, and socio-economic considerations (e.g., high operating costs, etc.).

Canada’s fishery is exclusively commercial, and conducted by fishermen mostly from Nova Scotia, and one licence holder from Newfoundland and Labrador. There is no recreational or sportfish component to this fishery.

Canada has consistently demonstrated the ability to fully utilize its ICCAT quota with average annual landings of 100 % of its annual allocations during the past 5 years, as demonstrated in **Figure 2**. Canadian utilization of its allocations since 2000, the year the rebuilding plan was introduced, is approximately 101% of its allocation during that time period. While harvests in some years exceed initial quota, they are in line with adjusted quota.

Figure 2



Since 2007, Canada has been allocated 8.8% of the ICCAT quota allocations. Nevertheless, Canada has accounted for close to 12% of all North Atlantic swordfish harvested over the past 5 years due to transfers.

The current fishery is conducted by harpoon (10% of national quota) and longline (80-90% of national quota annually) from Georges Bank to east of the Grand Banks of Newfoundland from April through December. Landings by harpoon gear by all fleets over the last 5 years have averaged 15-20% annually of the overall Canadian catch (longline licence holders are also permitted to use harpoon gear).

Over the past decade, total landings (including dead discards) for the entire Canadian fleet peaked at 1,664 t in 2005, with an average total catch of 1,493t over the past five years. **Canadian landings fully demonstrate Canada’s capacity to utilize its full quota in line with ICCAT management measures.**

Economic Value

This fishery is socially and economically important to many coastal and First Nations communities throughout Atlantic Canada. Fishermen from close to 50 different ports, primarily in Nova Scotia, participate in the fishery. Swordfish landings make up an integral portion of the overall revenue generated in many ports and communities.

Swordfish landings generate a significant source of revenue in several ports in Atlantic Canada with a landed value of well over \$10million (CDN). Principal ports include Shelburne, Sambro, Wood's Harbour and Clark's Harbour in Nova Scotia.

Duration of season

The Canadian commercial fishery follows the seasonal migration of the swordfish through Canadian waters, in accordance with the limitations of the gear types used, weather, and the availability of quota. The Canadian large pelagic longline fisheries which direct for, or incidentally catch swordfish, currently operate from April through December, though ICCAT Task 1 data indicates that in earlier years when quotas were not restrictive, catches could have occurred in any month. Prior to the introduction of ITQs, the swordfish fishing season was concentrated primarily in the summer months due to the quick exhaustion of the Canadian quota under a competitive fishery. The harpoon fishery for swordfish primarily occurs from June through late August.

The reality of the current ICCAT quota allocations is such that the Canadian fleet (which has been reduced significantly over the years in order to respect ICCAT quotas) is only able to harvest during a 3-month season before exhausting its quota. This is despite North Atlantic swordfish being present in significant numbers in Canadian waters throughout the year.

Geographic distribution

Harpooning for swordfish currently occurs primarily along the edges of Georges and Browns Banks, and targets large swordfish swimming or "basking" in surface waters during the day.

The Canadian large pelagic longline fishery extends from Georges Bank south of Nova Scotia to beyond the Flemish Cap east of Newfoundland when swordfish, the main species targeted, migrate into and adjacent to the Canadian Exclusive Economic Zone (EEZ). Longline fishing effort generally progresses from west to east and back again and from offshore to inshore along the edge of the continental shelf following swordfish movements associated with seasonal warming trends of surface water temperature, and a northward movement of the edge of the Gulf Stream. Swordfish migrate into the Canadian EEZ during summer and fall to feed in the productive waters of the continental shelf slope and shelf basins, areas where water temperatures form a distinct thermocline.

Until recently, the geographic distribution of the pelagic longline fishery tended to be quite similar from one year to the next. However, since 1998, there has been an increase in fishing activity east of the Grand Banks (beyond the Canadian EEZ) out to and beyond the Flemish Cap where catch rates have tended to be higher than other areas. This is also an area where longline fleets from other nations, such as Japan and the US, target large pelagic species. However, in recent years activity has only extended to the Grand Banks.

First Nations Participation

Since 2000, the Canadian Government has facilitated a transfer process to provide increased access to this fishery for First Nations participants. Currently, 11 of the 77 swordfish longline licenses are held by First Nations bands in Newfoundland, Nova Scotia and New Brunswick. The revenue generated from this fishery is integral to these small communities, which face significant economic hardships.

2. Existing management

Overview

Limitations on the number of licences

Since 1992, entry to the swordfish fishery, regardless of fleet sector, is limited to current licences. Licences have been fixed at this number, but may be reissued, within certain policy restrictions, from one harvester to another.

Rigorous monitoring, control, and surveillance of the fishery

Canada takes a comprehensive approach to enforcement that includes sophisticated vessel monitoring systems on all longline vessels, aerial surveillance, dockside monitoring, and at-sea observers.

Strong legislative and regulatory framework

In addition to the requirement for fleets to annually submit a Conservation Harvesting Plans specific to Swordfish and other tuna fleets and the fully Integrated Fisheries Management Plan, the Canadian swordfish fishery is governed by a suite of legislation, policy and regulations.

- International Commission for the Conservation of Atlantic Tuna (ICCAT)
- Fisheries Act
- Atlantic Fishery Regulations (AFR), 1985
- Fishery (General) Regulations, 1993
- Oceans Act, 1996
- Species at Risk Act, 2002
- International Plan of Action (IPOA) and Canada's National Plan of Action (NPOA) for reducing incidental catch of seabirds in longline fisheries
- IPOA for Shark Conservation
- Coastal Fisheries Protection Act, 1985
- Department of Fisheries and Oceans Act, 1985
- Atlantic Fisheries Restructuring Act, 1985
- Aboriginal Communal Fishing Licences Regulations, 1993
- Commercial Fisheries Licensing Policy for Eastern Canada 1996
- Sustainable Fisheries Framework: Conservation and Sustainable Use Elements
 - Precautionary Approach policy
 - Foraging Species policy
 - Sensitive Benthic Areas policy
 - By-catch policy (under development)

2.1 Fleet structure

The current Canadian fleet can be characterized as small-scale, with only a few vessels greater than 20 metres. The implementation of quota reductions in ICCAT resulted in significant economic hardship to the Canadian fleet, and led to extensive changes to Canada's domestic management framework, including significant reductions in access for Canadian swordfish harvesters.

Harpoon-only

There are 1,242 swordfish harpoon-only licences in Atlantic Canada. Of this total, current allocations restrict participation and, as such, only approximately 60 harpoon licenced fishers are active each year. Approximately half

of these fishers make dedicated trips for swordfish while the remaining licence holders have a licence which allows for the harpooning of a swordfish should they have the opportunity while harvesting another species.

Longline

There are a total of 76 pelagic longline licences as well as a unique offshore tuna licence, in Atlantic Canada. The longline licence holders are also permitted to harvest using harpoon gear.

The introduction of quota reductions as a result of the 10-year rebuilding plan agreed to in ICCAT has meant that not all Canadian licence holders can participate in an economically feasible swordfish fishery. Canada's introduction of an ITQ system in 2002 facilitated fleet self-rationalization to allow the fleet to better match fishing capacity with quota available to Canada and the longline fleet.

Nevertheless, approximately 1/3 of the 77 commercial swordfish licence holders remain inactive as it is not possible to prosecute an economically viable fishery for all licence holders with current quotas. The approximately 57 licence holders participating in the fishery each year are subject to strict fishing, monitoring and reporting requirements.

A unique offshore tuna licence, introduced in 2000, allows the license holder to conduct longline fishing operations Atlantic-wide. 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.

Time/Area Closures

Time and area closures to protect sensitive species or life-stages (e.g. a closure to protect large female swordfish) and marine protected areas are utilized in this fishery, and have resulted in the displacement of 10% of the active fleet from traditional fishing grounds.

In addition, the Minister of Fisheries and Oceans may, in any year, close any area to fishing for a specified time should any grave environmental or conservation concerns arise.

2.2 Quota management

In 2000, Canada implemented a change to the strictly competitive fishery by introducing distinct gear sector allocations for the two different gear types, along with the 5t by-catch allocation for the offshore tuna licence. It also introduced self-administered trip limits in the longline fleet, daily hauls once 65% of the fleet allocation was reached and a segregated swordfish by-catch quota within the longline fleet. In 2002, further measures were introduced to the longline fleet and Fisheries and Oceans Canada (DFO) introduced ITQs on a trial basis. This approach proved very successful in terms of quota management, increased length of season, fleet rationalization, and allowed for reorientation of effort toward other tunas. This program was approved on a permanent basis in 2003. The maximum concentration of quota through permanent transfers is limited to 5%.

Within the harpoon sector, the quota is assigned competitively and through an Individual Quota system.

The first step in determining the annual fishable quota for any year is to adjust the national allocation for any over-runs or roll-over amounts from the previous year. Adjustments are credited to or deducted from the gear sector that incurred them, with the exception of the unique offshore tuna licence. That licence receives a 5t by-catch limit annually from the top of the adjusted global quota and is not permitted to roll-over any underages of quota. The remaining Canadian quota is then allocated to the harpoon sector (10%) and to the longline sector (90%).

In consultation with industry, Canada incorporates measures into each fleets' annual harvesting plan to ensure that Canada does not exceed its annual adjusted quota of North Atlantic swordfish while permitting fleets to harvest

close to their assigned quota. Individual fleet quotas are monitored by the Department, as well as independently by the two main industry associations.

2.3 Monitoring, Control and Surveillance

Canada takes a comprehensive approach to enforcement that includes sophisticated VMS on all longline vessels (not just those over 20 meters as required by ICCAT), aerial surveillance, dockside monitoring, at-sea boardings and at-sea observers with coverage ranging from 5-10% despite no ICCAT requirements for observers onboard swordfish vessels smaller than 20 meters. License holders who fail to comply with the domestic regulations and conditions of license are liable for prosecution that may include fines, and suspension of license privileges. Both the dockside monitoring and at-sea observer programs are fully funded by industry.

All fishing activities must be recorded in DFO-approved logbooks and *Species at Risk* logs in the manner prescribed by the Department. This includes the provision of information on all discards of protected species, dead or alive. Swordfish harvesters must also abide by strict licence conditions, which include:

- Areas closed to fishing to protect swordfish broodstock, to prevent bycatch of bluefin tuna, and to protect sensitive marine protected areas;
- Minimum fish size restrictions;
- Requirements to hail out and hail in for all fishing trips;
- Dockside monitoring of all landings, in which every ton of fish is recorded by an independent 3rd party;
- Requirements for proper handling and release of identified species at risk including leatherback turtles and white shark.
- Requirements for proper handling and release of sensitive shark species identified by ICCAT including: bigeye, thresher, hammerhead, oceanic whitetip, and silky sharks.

Canada also has in place strict port access requirements for all ICCAT members landing swordfish in Canadian ports that go beyond the existing ICCAT port State measures.

2.4 Mitigation of non-target species bycatch

Due to the nature of this fishery, reducing by-catch and dead discards is important. To that end, industry has worked closely with government to implement a number of mitigating measures, such as:

- Mandatory use of circle hooks, which aim to reduce non-target species by-catch rates and to increase the probability of post release survival;
- Practicing live release, to the extent possible, of all sensitive species;
- Landing, reporting, and marketing non-target harvests to minimize resource waste; and
- Collaborating with DFO in a research program examining patterns of by-catch in the pelagic longline fishery, with a view to mitigating catches of sensitive species.

As a licence condition, pelagic longline licence holders must follow a code of conduct for the handling and release of marine turtles. All active vessels must carry safe handling and release equipment to mitigate harm as much as possible when handling and releasing marine turtles. All active participants in this fishery have been trained (by the Canadian Sea Turtle Network in March April 2011/13) and certified on the use of this equipment.

3. Scientific Work

3.1 Data and Information Collection in Support of Scientific Work

Canada's management of the swordfish fishery relies first and foremost on the best available science advice.

As the foundation for reliable research and stock assessments, the Canadian Atlantic statistical systems provide real time monitoring of catch and effort for all fishing trips. In 1994, an industry-funded Dockside Monitoring Program (DMP) was established in Atlantic Canada, according to DFO standards, for the swordfish longline fleet.

Overview of Atlantic Canada's statistical system and Dockside Monitoring Program:

- In place since 1996, this system has applied to all fleets and included monitoring of all trips, even when no fish were caught.
- At the completion of each fishing trip, independent and certified Dockside Monitors must be present for off-loading, and log record data must be submitted by each fisherman to the Monitoring Company that inputs the data into a central computer system.
- Log records contain information on catch, effort, environmental conditions (e.g., water temperature) and bycatch.
- Log records from trips with catch must be received from fishermen before they can proceed with their next fishing trip (log records from zero catch trips can be mailed in at a later time). This ensures 100% coverage of properly completed log records and individual fish weights.

3.2 Research

Canada has been a leader in supporting ICCAT's scientific investigations of the swordfish resources in the Atlantic for the past several decades. Canada has a tradition of contributing a scientific leader to the Coordinator role for the three stock assessments conducted by the SCRS (North Atlantic, South Atlantic, and Mediterranean), and such well-known scientists as Drs. J. Beckett, J. Porter and J. Neilson have contributed to this important role. As a result of Canada's well-recognized ability to collect and maintain fisheries statistics of importance to the stock assessment, Canada contributes the longest series of catch rate information to the North Atlantic stock assessment, commencing in 1963. As further described in subsequent paragraphs, Canada is leading ground-breaking research on satellite archival tagging studies of swordfish that have attracted international recognition.

Canadian scientists are leading international efforts to learn more about swordfish migration and biology. They are supported in those efforts by Canadian swordfish harvesters who understand the importance of sustainability for the future of the fisheries.

3.3 Industry/NGO collaboration

Industry is fully engaged in the conservation and management efforts for this species to ensure its sustainability, including participation in scientific research, funding of independent at-sea observers to monitor the fishery and funding independent third party monitors who observe and record all landings at dockside. The harpoon fleet provides funds or in-kind vessel support for scientific research in lieu of at-sea observer coverage.

Harvesters and environmental non-governmental organizations (ENGOs) offer their expertise and experience in the development of Canada's Integrated Fisheries Management Plans, and are encouraged to provide additional financial or technical contributions for at-sea research related to this stock.

For example, the Canadian harpoon and longline fleets have been collaborating with DFO in an archival tagging project to track migratory patterns of the swordfish stock to get a better understanding of its movements and migrations throughout the North Atlantic. Harvesters are also collaborating closely with ENGO's (World Wildlife Fund) and universities (Dalhousie University) on by-catch mitigation measures.

Canada's Sustainable Fisheries Framework forms a foundation for implementing an Ecosystem Based Management approach in the management of its fisheries. Of particular note for the ICCAT managed fisheries is the advancement of ecosystem objectives and policies related to biodiversity through a By-catch Management Project, and a work

plan specifically aimed at addressing bycatch and discarding in Canadian large pelagic fisheries. The work plan includes projects aimed to both manage discards as well as control incidental mortality in large pelagics fisheries.

Finally, Canada has provided leadership in the past by providing a scientist to coordinate the work of the Swordfish Species Group for the SCRS, thereby contributing to the successful management of the three swordfish stocks in ICCAT's mandate. Currently, the leadership role extends to ecosystem related issues with assessment support for Bluefin tuna and north Atlantic swordfish.

4. Eco-certification

Canada's swordfish fisheries are acknowledged to be well-managed and sustainable. The harpoon portion of Canada's Northwest Atlantic swordfish fishery earned sustainable seafood certification under the Marine Stewardship Council (MSC) in June 2010, following a comprehensive fishery assessment process carried out by an independent, accredited certifier. The longline fishery was awarded MSC certification in April 2012, meaning that Canada's entire North Atlantic swordfish fleet is MSC certified.

5. Interests/aspirations

In light of the role played by Canada to develop and implement a successful ICCAT rebuilding plan and the need for an increased quota to ensure the viability of the Canadian swordfish fishery for the coastal communities across Atlantic Canada which depend on fishing opportunities for North Atlantic swordfish, Canada will be seeking increased access to this fishery.

Canada has a demonstrated historical participation in the fishery, dating back to the late 1800s, and has a consistent record of compliance with ICCAT measures. Canada has also, on an ongoing basis, contributed significantly to the collection and provision of accurate data, and scientific research in order to enhance the work of the Commission.

While Canada, like other ICCAT members, accepted significantly lower quotas during the rebuilding period, Canada is the only ICCAT member which has consistently demonstrated its ability to fully utilize its quota.

Average annual landings have totalled 100% of Canada's annual allocations during the past 5 years. Since 2007, Canada has been allocated 8.8% of the total ICCAT quota for North Atlantic swordfish. Nevertheless, Canada has accounted for approximately 12 % of all North Atlantic swordfish harvested (due to its receiving of transfers) over the past 5 years.

ICCAT members should recognize the aspirations of coastal and developing nations, while remedying the current situation of over-allocation.

**A Report on the History of United States Swordfish Fishing and a
Development/Management Plan for the United States Swordfish Fishery
Prepared Pursuant to ICCAT Recommendation 13-02**

September 15, 2015

U.S. Department of Commerce, NOAA Fisheries

I. Executive Summary

ICCAT Recommendation 13-02 renewed the requirement for each CPC to submit its development or fishing/management plan to the Commission by September 15 of each year. This document describes the history, future development, management, and socio-economic aspects of the U.S. North Atlantic swordfish (*Xiphias gladius*) fishery.

The conservation and management of U.S. Atlantic swordfish fisheries since 1985 – five years before active management by ICCAT – has been defined by a comprehensive suite of ecosystem-based measures that go beyond the requirements of ICCAT recommendations. These measures have been developed following the results and advice from scientific studies with the goal of developing and maintaining a sustainable swordfish fishery. The U.S. commercial swordfish fishery is quota managed and operated under a permit program. There are no trip limits for directed commercial swordfish permit holders, and there is a trip limit of 30 swordfish per trip for incidental swordfish permit holders. U.S. commercial swordfish fishermen may only sell to permitted swordfish dealers, and reporting in a logbook is mandatory for limited access permit holders. All importers, exporters, and re-exporters of swordfish are required to obtain an International Trade Permit and submit bi-weekly reports. All pelagic longline vessels fishing in the Gulf of Mexico must use weak hooks to reduce bycatch of bluefin tuna. In addition, all pelagic longline vessels are required to have a functioning vessel monitoring system (VMS) unit onboard, are subject to mandatory observer coverage, and effective June 1, 2015, are required to have electronic monitoring systems installed, operable, and certified in order to depart on a fishing trip with pelagic longline gear on board. The U.S. observer coverage target for this fishery is eight percent of all fishing sets in each area/quarter strata; actual coverage in 2014 was 12.9 percent overall.

The United States has implemented several time/area closures for pelagic longline gear to minimize bycatch mortality of juvenile swordfish and other highly migratory and protected species. The United States has implemented sea turtle protection measures including the use of dipnets and line cutters to release turtles. Gangion lengths must be 110 percent of the length of the floatline in sets of 100 meters or less in depth, sea turtle guidelines for safe handling and release must be posted inside the wheelhouse, and fishermen must use corrodible circle hooks on all pelagic longline vessels. In addition, all U.S. longline vessel owners and operators must attend mandatory workshops to learn to carefully release and handle sea turtles and other protected species.

Recreational swordfish fishermen must have an Angling or Charter/Headboat permit and the sale of recreational landings of swordfish is prohibited. Recreational trip limits for swordfish include one per person, up to four per trip. In addition, charter boats and headboats may retain one swordfish per paying passenger for a total of up to six and 15 swordfish, respectively. Recreational fishermen are required to report all non-tournament swordfish landings and tournament operators, if selected, must report tournament swordfish landings. If a tournament is not selected, vessel owners are responsible for reporting their swordfish landings.

The United States has also implemented extensive scientific programs to support the collection of reliable fishery data, participation in stock assessments, and innovative research on swordfish biology, life history, and fishing techniques to reduce bycatch. These actions support our efforts to prevent and eliminate overfishing and excess fishing capacity, while ensuring that levels of fishing effort are commensurate with the ICCAT objective of achieving and maintaining a swordfish biomass that can support MSY. Together, they help ensure the sustainability of the swordfish stock and support an ecosystem-based approach to management.

Several U.S. domestic management measures (e.g., gear requirements, time/area closures, bycatch mitigation) have temporarily affected the ability of the U.S. fleet to fully harvest its ICCAT allocation. For example, as a responsible steward of the Florida Straits swordfish nursery grounds, U.S. actions to reduce fishing effort by our fleet in this area reduced mortality on both immature and mature swordfish. Such actions resulted in substantial declines in U.S. catches during the first part of the last decade (2001-2006), which were further exacerbated by natural disasters such as Hurricanes Katrina and Rita. However, these same measures also resulted in a significant U.S. contribution to the health and rebuilding of the North Atlantic swordfish stock and the associated marine ecosystem, to the ultimate benefit of all ICCAT members that fish for this stock.

Ecosystem based management plays a key role in the sustainability of fisheries. It is a challenging but essential task to achieve broad ecosystem conservation and management objectives while preserving a viable fishery. As this document will demonstrate, the United States is taking its ocean stewardship responsibilities seriously. While ICCAT has taken some steps aimed at addressing certain ecosystem matters, in particular with regard to bycatch, the United States has gone beyond those requirements, and we are implementing measures designed to ensure the health of both the swordfish stock and the fishery. It is important for ICCAT and other RFMOs to encourage these kinds of efforts by their members in order to ensure sustainable fisheries and healthy ecosystems.

Since the North Atlantic stock of swordfish was declared rebuilt, the United States has been fully committed to the revitalization of our swordfish fishery and has made significant efforts over the past few years to restructure its fisheries and adjust regulatory constraints on its swordfish fishery in light of the new circumstances. These measures are designed to increase swordfish landings while ensuring that the fishery complies with U.S. laws and regulations, including those aimed at preserving the long-term sustainability of the stock, and ICCAT requirements. Notably, in 2013, the Marine Stewardship Council certified the U.S. North Atlantic Swordfish fishery.

In summary, the United States has chosen to pursue a prudent and deliberate strategy of allowing an incremental increase in Atlantic swordfish fishing effort to ensure an environmentally and economically sustainable fishery while preserving its record of strong sustainable management of the fishery, including through implementation of all ICCAT recommendations. Our approach to the management of this fishery supported ICCAT's rebuilding efforts and is now helping to ensure the long-term sustainability of the stock in accordance with the objectives of the Convention. The United States looks forward to continuing its active participation in this socially and economically important fishery. To that end, this document describes the interests, fishing patterns, and fishing practices of the U.S. Atlantic swordfish fleet – past, present, and future.

II. History of the U.S. Swordfish Fishery

Early History (1800s - 1960s)

The United States has a long history of fishing for swordfish. The commercial North Atlantic swordfish fishery began in the early 1800s as a harpoon fishery off the New England coast in the northeastern United States. Sailing vessels used harpoons to capture swordfish on extended trips to the Hudson Canyon and Georges Bank during summer months. The catch was dominated by large fish that basked at the surface. Eventually, the fishery expanded to follow annual migration patterns along the eastern North American seaboard. For more than 150 years, up until the 1960s, most U.S. commercial swordfish were caught using harpoons or handlines. A small U.S. recreational swordfish fishery developed in the 1920s using rod and reel and handline, primarily from Massachusetts to New York. As diesel engines came to replace sail, pelagic longlines eventually replaced harpoons as the primary commercial swordfish gear during the 1960s.

1985 U.S. Swordfish Fishery Management Plan (1970s – 1980s)

The U.S. pelagic longline fishery grew steadily during the 1960s and 1970s. At the same time, a recreational rod and reel fishery developed in Florida during the 1970s, and many towns along the Mid-Atlantic coast developed a tradition of holding annual swordfish tournaments, which contributed to tourism and local economies. As overall Atlantic swordfish fishing effort increased in the 1980s, the commercial U.S. pelagic longline fishery also expanded into the Grand Banks, Florida Keys, and Gulf of Mexico. In 1985, the first U.S. Atlantic Swordfish Fishery Management Plan (FMP) was implemented, which included reductions in the harvest of small swordfish, permitting and monitoring requirements, and scientific research. Paralleling the overall increase in reported landings of North Atlantic swordfish, the U.S. commercial swordfish catch grew steadily through the 1980s, before peaking in 1989 at 6,411 mt. At the same time, the average North Atlantic swordfish caught in the late 1990s weighed only 41 kg as compared to an average of 113 kg for harpoon-caught swordfish in the 1960s.

ICCAT Swordfish Management Begins (1990s)

In 1990, with leadership from the United States, ICCAT recommended reductions in the harvest of undersized swordfish (Rec. 90-02). To comply with the ICCAT recommendation, in 1991 the United States established a minimum size limit of 25 kg with a 15 percent tolerance based on the number of swordfish landed. A corresponding minimum size of 119cm LJFL/15 kg, with zero tolerance, was later adopted by ICCAT (in 1995), at the initiative of the United States, in order to provide a more enforceable mechanism for protecting juvenile swordfish.

In 1994, ICCAT recommended further reductions in North Atlantic swordfish landings by implementing quotas for the first time and encouraging countries to maintain their minimum size regulations and to take other measures to protect small swordfish, including the establishment of time and area closures. In 1995, the number of U.S. open access swordfish permit holders peaked at 1,531 (with about 400 active pelagic longline vessels). In 1996, with strong leadership from the United States, ICCAT adopted a 3-year phase down of TACs to the level of replacement yield for years 1997, 1998, and 1999 with the goal of ending overfishing.

In 1999, the United States prohibited the use of all small-scale driftnets in the North Atlantic swordfish fishery due to concerns about marine mammal bycatch. Driftnets greater than 2.5km in length had already been banned in the United States following the UN moratorium on large-scale pelagic driftnet fishing on the high seas. The United States also implemented regulations to track swordfish trade, including dealer permitting and reporting for all swordfish importers, documents indicating the country of origin and flag of the vessel (the U.S. certificate of eligibility program), and a prohibition on the import of undersized swordfish based on U.S. implementation of ICCAT's alternative minimum size recommendation first adopted in 1995.

U.S. FMP for Atlantic Tunas, Swordfish, & Sharks (1999)

The United States finalized a new FMP for Atlantic Tunas, Swordfish and Sharks in 1999, which replaced the 1985 Atlantic Swordfish FMP. The 1999 FMP contained several important management measures to rebuild the swordfish stock including: 1) an annual swordfish quota; 2) limited access swordfish vessel permits and vessel upgrading restrictions; 3) swordfish dealer permits; 4) minimum size requirements; 5) a 1-month pelagic longline closed area to reduce bluefin tuna dead discards; 6) both observer coverage and logbook reporting; 7) vessel

monitoring systems (VMS) for pelagic longline vessels; and, 8) tournament registration and tournament reporting requirements for tunas, swordfish, and sharks. Many of these requirements are still in effect and are described in detail in Section IV. The 1999 FMP also called for the United States to seek the adoption of an international swordfish rebuilding program.

ICCAT 10-Year Swordfish Rebuilding Plan Established (1999)

In 1999, the SCRS indicated that North Atlantic swordfish biomass had dropped to approximately 65 percent of B_{msy} and that current levels of catch would lead to continued stock decline. In response, and with significant participation from the United States, ICCAT established a 10-year rebuilding program for North Atlantic swordfish (Rec. 99-02). The ICCAT rebuilding program began in 2000 with a goal for the stock to be rebuilt by 2010. One component of the program was to protect small fish. The ICCAT measure reduced total allowable catches (TACs) for the three year period 2000-03, starting at 10,600 mt. TACs were inclusive of dead discards. The measure also continued the prohibition on the taking of swordfish less than 119 cm LJFL, or 15 kg as an alternative (with no tolerance for fish less than 119 cm LJFL or 15 kg). For 2001 and 2002, the overall TAC was set at 10,500 and 10,400 mt, respectively. The annual U.S. swordfish quota for 2000 – 2002 was set at 2,951 mt. Based on scientific advice, ICCAT revised the TAC and other provisions of the rebuilding program periodically throughout the rebuilding period.

Implementation of U.S. Pelagic Longline Closed Areas (2000 – 2001)

To reduce the bycatch of undersized swordfish, billfish, sharks, and protected species, the United States implemented several large time/area closures for pelagic longline vessels in 2000 and 2001, which closed a total of 132,670 square nautical miles (343,610 square kilometers) to pelagic longline gear. These closures included the DeSoto Canyon year-round closure (Gulf of Mexico), the Florida East Coast year-round closure, and the Charleston Bump seasonal closure (mid-Atlantic coast). These time/area closures resulted in reduced U.S. North Atlantic swordfish landings. Those reduced landings factored into a lower fishing mortality rate for the stock and contributed to the North Atlantic swordfish stock being declared almost fully rebuilt ($B/B_{msy} = 0.99$) in 2006, four years ahead of schedule.

Implementation of Sea Turtle Protection Measures (2001 – 2004)

In 2000-2001, to reduce sea turtle bycatch the United States closed 2,631,000 square nautical miles (9,035,617 square kilometers) of the Northeast Distant Statistical Area (NED) to fishing by the U.S. pelagic longline fleet. The closed area included portions of the high seas where the vessels of many nations operated. Of course, only the operations of U.S. flag vessels were affected by the NED closure.

The United States also implemented regulations during this period to require: (1) dipnets and line clippers to be used to safely release sea turtles; (2) gangion lengths to be 110 percent of the length of the floatline in sets of 100 meters or less in depth; (3) sea turtle guidelines for safe handling and release to be posted inside the wheelhouse; and (4) the use of corrodible hooks on all pelagic longline vessels.

From 2001 - 2003, the United States conducted a research experiment with the pelagic longline fishing industry in the NED to determine if gear modifications and other techniques could reduce sea turtle bycatch and bycatch mortality. The results of the experiment showed that large circle hooks with finfish bait reduced sea turtle bycatch rates. Based upon the results of this experiment and consistent with domestic requirements to protect certain sea turtle species, the United States reopened the NED to pelagic longline fishing in 2004, but required the use of large circle hooks 18/0 gauge or larger only with finfish baits, the use of release tools, and adherence to careful sea turtle handling and release techniques. The United States also distributed revised sea turtle handling and release placards, protocols, and videos to all pelagic longline vessels. The placards, protocols, and videos were made available in English, Spanish, and Vietnamese.

The United States has continued to pursue sea turtle conservation through international, regional, and bilateral organizations, including ICCAT, the InterAmerican Convention for the Protection and Conservation of Sea Turtles, and the FAO Committee on Fisheries. Sea turtle bycatch mitigation technology has been shared with many other nations fishing in the Atlantic including Spain, Canada, Morocco, Mexico, Italy, and Uruguay. Cooperative research has been conducted with the Dominican Republic, Turkey, Spain, Canary Islands, Brazil, Uruguay, Italy,

and South Korea, and the United States is currently engaged in a joint research project with Chinese Taipei to test the use of circle hooks in their deep set pelagic longline fishery.

Implementation of U.S. Recreational Swordfish Management Measures (2003)

In order to further improve and expand the collection of fishery data, the United States required that all recreational vessels fishing for swordfish, tunas, billfish, and sharks must obtain a recreational angling permit. In January 2003, the United States established a mandatory reporting system for all non-tournament recreational landings of swordfish. These regulations became effective in March 2003.

Highly Migratory Species (HMS) International Trade Permit (2005)

In 2005, the United States began requiring all importers and exporters of swordfish to obtain an annual International Trade Permit and submit bi-weekly activity reports. One goal of this program is to enforce the requirements of ICCAT's statistical document programs, including for swordfish. The permit program is also designed to support and reinforce the U.S. ban on imports of swordfish below the ICCAT minimum size and ensure that this ban is respected by all trade partners.

2006 ICCAT Recommendation

ICCAT Recommendation 06-02 set a TAC for the rebuilding North Atlantic swordfish fishery of 14,000 mt for 2007 and 2008 with 3,907 mt allocated to the United States for each year. The 2006 recommendation established carryover caps specifying that the maximum quota underage that could be carried over could not exceed 50 percent of the quota allocation. The United States agreed to allocate 2,690 mt of its underharvest from 2003 - 2006 to the TAC for 2007 and 2008 to accommodate the swordfish fisheries of developing States (evenly split at 1,345 mt per year for 2007 and 2008).

Protected Species Workshops for Longline Vessels/Authorization of Buoy Gear (2006)

In October 2006, the United States finalized its Consolidated HMS FMP which implemented many new management measures for swordfish, tunas, billfish, and sharks. With regard to swordfish, the new regulations established mandatory workshops for all pelagic longline fishermen to train them in the careful release and handling of sea turtles and other protected species. As a result, all U.S. pelagic longline vessel owners and operators must become certified at protected species workshops and renew this certification every three years. The first workshops were conducted in 2006 and have continued each year since.

The 2006 Consolidated HMS FMP also authorized the use of buoy gear for commercial swordfish fishing. Since 2006, the U.S. buoy gear fishery has grown to about 25 active vessels based primarily in southeastern Florida. The gear is relatively simple and inexpensive, and it consists of a single section of heavy monofilament or braided nylon to which one or two hooks and one or more floatation devices (i.e., buoys) are attached. Approximately 10-15 units of this free-floating gear are deployed 35-50 meters apart at night, when swordfish are feeding close to the surface. When a swordfish strikes the bait, the attached buoys are dragged away alerting the fisherman that a swordfish has been hooked. The fisherman can quickly land the fish ensuring a high quality product (and price) and allowing for immediate re-deployment of the gear. Results of a recent two-year study showed that the use of buoy gear resulted in increased swordfish catch rates and low bycatch as compared to longline gear.

Revitalization of U.S. Swordfish Fishery (2007 – 2013)

Decreased swordfish stock abundance, natural and man-made disasters, market conditions, management regulations, and increased operating costs contributed to a generally declining trend in U.S. swordfish landings starting in 1990 with the lowest catches in this time period reported in 2006 (2,057 mt). The United States took several important steps to address this issue as the North Atlantic swordfish stock continued to rebuild. In 2007, the United States modified pelagic longline vessel upgrading requirements, increased incidental swordfish landing limits, and increased recreational landing limits to provide additional opportunities for U.S. vessels to harvest the allocated swordfish quota. These actions allowed for increased U.S. swordfish catches while continuing to minimize the bycatch of undersized swordfish and protected species.

In January 2008, the United States started research on pelagic longline bycatch rates within some of the pelagic longline closed areas. The final report on the first round of this research has been released, and the U.S. National Marine Fisheries Service (NMFS) is evaluating potential next steps. This research is providing information for future swordfish management activities, which could include alterations to the length and/or size of current time and area closures. In July 2008, the United States relaxed restrictions on the renewal of certain longline permits. This action helped to ensure that an adequate number of pelagic longline permits would be available to fish for swordfish as the stock rebuilt. In 2011, the United States modified incidental retention limits for *Illex* squid trawl vessels to reduce regulatory dead discards of swordfish. Further, in 2012, the United States implemented ICCAT Recommendation 11-02 which, among other requirements, included an alternative swordfish minimum size measurement of 63.5 cm cleithrum to caudal keel (CK). U.S. revitalization efforts are discussed in greater detail in Section III. In 2009, the SCRS indicated that overfishing was not occurring ($F_{2009}/F_{MSY} = 0.76$) and the stock was not overfished ($B_{2009}/B_{MSY} = 1.05$). Thus, ICCAT's rebuilding objective for North Atlantic swordfish had been achieved ahead of the schedule established in the 1999 rebuilding program.

On August 21, 2013, the United States published a final rule to implement a new open access commercial vessel permit to retain and sell a limited number of swordfish caught on rod and reel, handline, harpoon, greenstick, and bandit gear. The intent of the new open access swordfish permit is to provide additional opportunities for U.S. fishermen to commercially harvest swordfish using selective gears that are low in bycatch given the rebuilt status of the swordfish and their increased availability.

III. Revitalization and the Future of the U.S. Swordfish Fishery

U.S. commercial fisheries have faced several challenges over the past decade, including severe hurricanes and the 2010 Deepwater Horizon/BP oil spill in the Gulf of Mexico. The impacts of both Hurricane Katrina and Hurricane Rita in 2005 had a devastating effect on many Gulf of Mexico communities. Economic losses to the commercial fishing industry in Louisiana and Mississippi from Hurricane Katrina are estimated to be \$13 billion and \$484 million dollars, respectively (Impact Assessment Inc, 2007). The U.S. pelagic longline fishery was significantly impacted by these hurricanes primarily because many Gulf of Mexico fishermen were displaced from their homes. Some estimates indicate that in the wake of these hurricanes, approximately half of the Gulf of Mexico pelagic longline fleet was not operational (National Fishermen, 2006). This certainly contributed to the decline in U.S. swordfish landings in 2006. Hurricanes Gustav and Ike also caused damage to Gulf of Mexico coastal communities in 2008, with damage to the fishing industry in Louisiana estimated to be \$300 million dollars (Times-Picayune, 2008).

In response to the 2010 Deepwater Horizon/BP oil spill, the United States issued a series of emergency rules that closed portions of the Gulf of Mexico EEZ to all fishing activities. The closures ranged in size from 6,817 sq. mi. (<4 percent of the U.S. Gulf of Mexico) on May 2, 2010, to 88,522 sq. mi. (approx. 37 percent of the U.S. Gulf of Mexico) on June 2, 2010. As a result of these closures, a significant part of the U.S. Gulf of Mexico pelagic longline fleet was inactive for at least six months during 2010. As expected, there was a temporary decrease in swordfish catches in this region. 2010 U.S. swordfish catches totaled 2,412 mt, with 217.9 mt caught in the Gulf of Mexico. Swordfish catch rebounded in 2011 and 2012 with landings of 2773.7 mt, and 3,651 mt respectively.

In light of these and other challenges, the United States has implemented proactive measures to revitalize the U.S. swordfish fleet, as summarized below:

- The United States re-opened NED closed area to pelagic longline vessels in 2004, requiring circle hooks and specific baits to reduce sea turtle bycatch.
- The United States authorized 'buoy gear' to fish for swordfish in 2006, which maximizes target catch and minimizes bycatch.
- Pelagic longline vessel upgrading restrictions were relaxed in 2007, removing barriers to larger and more powerful vessels participating in the swordfish fishery.

- The United States increased commercial and recreational swordfish retention limits in 2007.
- In 2008, the United States relaxed some permit conditions, allowing certain pelagic longline permits that had previously been expired to be renewed. This has allowed dozens of previously expired commercial swordfish permits to be utilized again.
- In 2011, the United States modified incidental retention limits for *Illex* squid trawl vessels to reduce regulatory dead discards of swordfish.
- In 2012, the United States implemented an alternative swordfish minimum size measurement pursuant to ICCAT recommendation 11-02, which will allow U.S. vessels to land legal-sized fish that would previously have had to be discarded. This change is estimated to increase future U.S. swordfish landings by at least 68 mt whole weight
- In 2013, the United States implemented a new open access commercial vessel permit to retain and sell a limited number of swordfish caught on rod and reel, handline, harpoon, greenstick, and bandit gear. The intent of the new open access swordfish permit is to provide additional opportunities for U.S. fishermen to commercially harvest swordfish using selective gears that are low in bycatch given the rebuilt status of the swordfish and their increased availability.

As a result of these revitalization efforts - and despite natural disasters and domestic actions to implement bycatch protection measures and other ecosystem approaches that have reduced effort - the U.S. swordfish fishery has shown an increasing trend in catch from 2006 through 2013. Table 1 shows U.S. catches of North Atlantic swordfish since 2006.

Table 1. Change in U.S. Swordfish Catch Since 2006

Year	U.S. Catch (mt)	+/- Tonnage relative to 2006	% Change Relative to 2006
2006	2,058	--	--
2007	2,683	+625	30%
2008	2,592	+534	26%
2009	2,878	+820	40%
2010	2,412	+354	17%
2011	2,773	+715	35%
2012	3,610	+1,552	75%
2013	2,944	+897	44%
2014 (preliminary)	1,954	-104	-5%

In conjunction with the increases in U.S. swordfish landings, there has also been a recent emergence (or re-emergence) of alternative fishing gears used to fish commercially for swordfish, including buoy gear, harpoon gear, and rod and reel. These gears are considered “handgear” and have the benefit of low bycatch and bycatch mortality

rates compared to pelagic longline gear. As the swordfish stock has rebuilt, the abundance of swordfish in the larger size classes has also increased and so these gears have become more economically viable. The United States believes this is a positive development that will help to facilitate a sustainable fishery and continue to produce a high quality product for consumption. To support domestic demand, the United States is providing consumers with factual information to inform their purchasing decisions. Information regarding swordfish stock status, management, and nutritional data is provided on federal internet websites and distributed using other media.

Revitalization of the U.S. swordfish fishery is an ongoing process. Retention limits have been increased and permit availability has expanded consistent with domestic legal obligations. Important research continues to be conducted to inform future management decisions. The United States has chosen to pursue a prudent and deliberate strategy of incrementally increasing swordfish fishing effort to ensure an environmentally and economically sustainable fishery. This long-term strategy is expected to continue to result in steadily increasing swordfish catches with minimal adverse ecological impacts on juvenile swordfish as well as protected and other species.

IV. U.S. Swordfish Management Measures

Atlantic swordfish management actions in the United States are developed, coordinated, and implemented through a single fishery management plan entitled *The 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan*, which is issued under the jurisdiction of the National Marine Fisheries Service. Recommendations adopted by ICCAT, including annual quota allocations to the United States, are implemented in the United States by regulation under the authority of the Atlantic Tunas Convention Act (ATCA). The annual U.S. swordfish quota allocation is divided into equal semi-annual directed fishery quotas (all commercial landings), an annual incidental catch quota for fishermen targeting other species or taking swordfish recreationally (300 mt dressed weight), and a reserve category. Domestic legislation including the Magnuson-Stevens Act, the Endangered Species Act, and the Marine Mammal Protection Act also result in requirements for conservation and management measures for both recreational and commercial sectors.

Permitting and Effort Controls

The U.S. swordfish fishery is quota-managed and is operated under a limited access permit program. NMFS no longer issues new limited access permits for Atlantic swordfish. Permits can be transferred between vessels, but are subject to vessel upgrading restrictions to control effort, although these have recently been somewhat relaxed to encourage renewed participation in the fishery. Four types of limited access permits are available to U.S. commercial fishermen; directed swordfish; swordfish handgear; incidental swordfish; and incidental HMS squid trawl. Directed permits allow fishermen to target swordfish using any authorized gear. Directed permit holders must also hold an Atlantic Tunas Longline permit and an Atlantic Shark limited access permit to fish with pelagic longline gear for swordfish. A swordfish handgear permit allows fishermen to target swordfish using only handgear (rod & reel, handline, harpoon, and buoy gear). Directed swordfish permit holders and swordfish handgear permit holders are not subject to trip limits. Incidental swordfish permits allow fishermen to land up to 30 swordfish while engaged in other fishing activities, but these fishermen must also have valid Atlantic Tunas Longline and Atlantic Shark permits. In 2011, the United States implemented the Incidental HMS Squid Trawl permit which allows *Illex* squid trawl vessels to retain up to 15 swordfish per trip. Trawl gear is otherwise not authorized for HMS. The general commercial swordfish permit is an open access permit that allows sale of a limited number of swordfish using handgear, as of 2014.

Swordfish vessel permit holders may only sell to permitted swordfish dealers. Atlantic swordfish dealers must obtain an Atlantic swordfish dealer permit to receive, purchase, trade for, or barter for Atlantic swordfish from a vessel. Dealers importing and/or exporting swordfish must obtain an International Trade Permit. Recreational fishermen must be issued an Angling or Charter/Headboat permit to fish for swordfish. HMS tournaments must be registered at least four weeks prior to the tournament. Swordfish may not be sold by recreational anglers.

Minimum Size and Landing Requirements

The minimum size of swordfish that can be landed under any HMS permit is 119 cm (47 in.) lower jaw fork length (LJFL). If the head of a swordfish is no longer naturally attached when landed, swordfish must be at least 63cm (25 in.) from the cleithrum to caudal keel (CK). A swordfish damaged by shark bites may only be kept if

the remainder of the carcass meets these specifications. Swordfish must be kept whole or in dressed form (a headed/gutted fish with some or all fins removed). A swordfish may not be filleted or cut into pieces at sea. Dressed swordfish are measured using CK and whole swordfish are measured using LJFL.

Gear Specifications

The U.S. pelagic longline fleet must comply with several types of gear specifications including gear type (handgear or longline only), mandatory use of corrodible circle hooks of a specified size and whole finfish or squid baits, gangion length, and the use of weak hooks in the Gulf of Mexico to reduce the bycatch of bluefin tuna. The swordfish handgear permit may only be used for handline, buoy gear, rod and reel, harpoon, and bandit gear; longline gear may not be on board. Buoy gear specifications include gear configuration, number and type of floatation devices, deployment processes, and gear marking. Holders of a swordfish Incidental permit are subject to the gear deployment restrictions of target fisheries. Holders of the Incidental HMS Squid Trawl permit may only use trawl gear, and 75 percent of the overall catch must be squid. Recreational fishermen may only use rod and reel or handline gear.

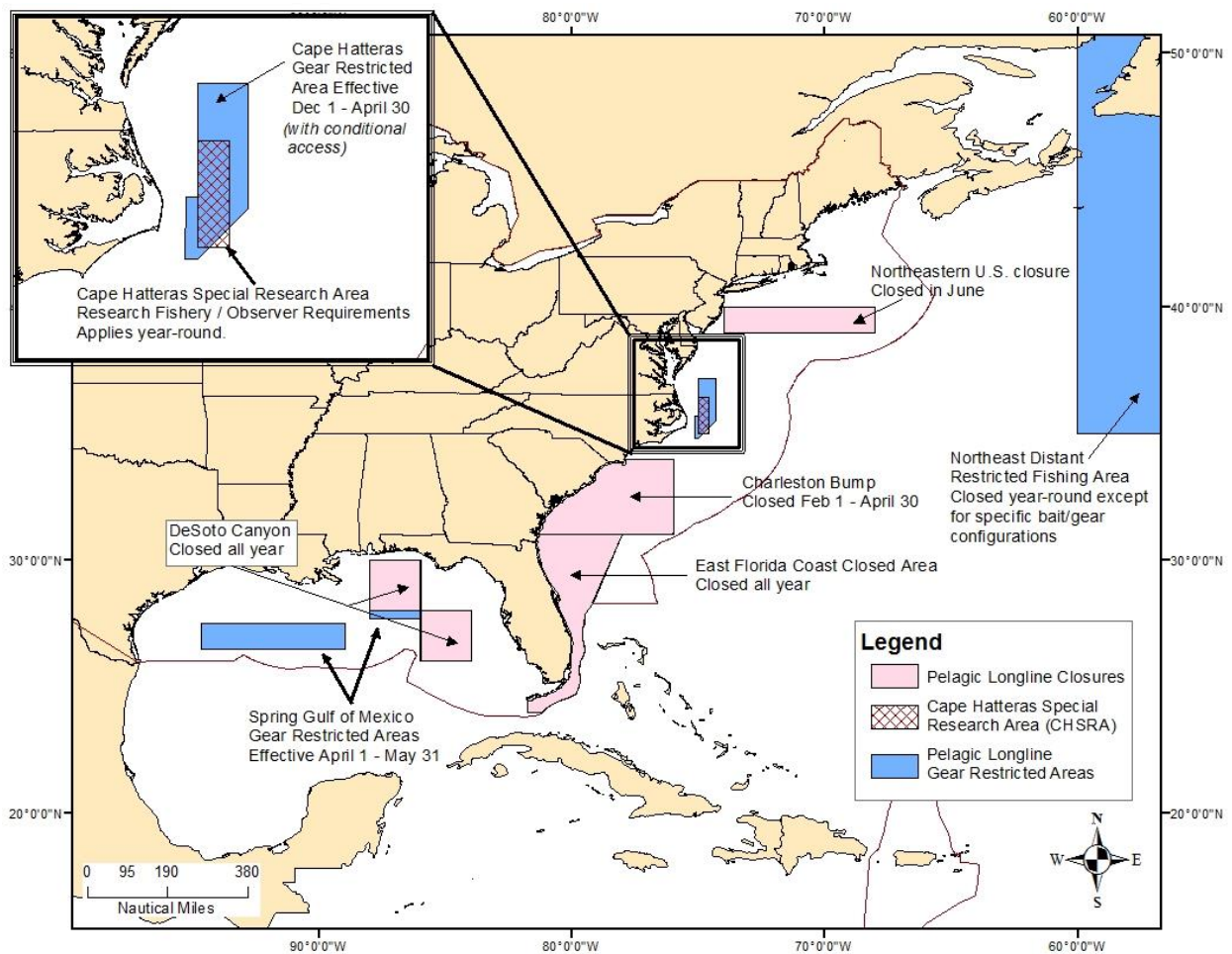
Retention Limits

There is no trip limit for Directed permit holders when the swordfish directed fishery is open. When the directed fishery is closed, retention is restricted to 15, two, and zero swordfish for pelagic longline, handgear, and harpoon fisheries, respectively. The incidental limits are 30/trip. *Illex* squid trawl vessels with an HMS permit may retain 15/trip. General commercial handgear permit holders may retain up to three per trip, depending on the region. Retention limits for the recreational fishery are one per person up to four per trip; charter boats and headboats may retain one per paying passenger up to six and 15 swordfish per trip, respectively.

Time & Area Closures/Gear Restricted Areas

Three areas in the Gulf of Mexico are closed to all HMS gear to protect spawning aggregations of gag grouper (*Mycteroperca microlepis*) (Madison-Swanson and Steamboat Lumps closed areas, and the Edges 40 Fathom Contour closed area). Several time/area closures pertain specifically to pelagic longline gear to protect undersized swordfish and to minimize the bycatch of other HMS and protected species. These include the Florida East Coast closed area, the Charleston Bump closed area, and the DeSoto Canyon closed area. Only 18/0 gauge circle hooks and specified baits may be deployed by pelagic longline vessels in the NED Gear Restricted Area. Two gear restricted areas were implemented in 2015 to reduce interactions with bluefin tuna: the Cape Hatteras Gear Restricted Area and the Spring Gulf of Mexico Gear Restricted Areas. Please see Figure 1 below for a chart of the major HMS closed areas.

Figure 1. **Time/area closures and gear restricted areas that limit restrict use of pelagic longline gear in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea**



Reporting Requirements

Reporting in a logbook is mandatory for all limited access swordfish permit holders. Logbooks must be completed within 48 hours of completion of a day’s activities or before offloading for one day trips, whichever is sooner. A selected number of fishermen must also complete a cost-earnings section of the HMS logbooks to provide socio-economic information. To minimize reporting burden, fishermen incidentally targeting swordfish may report in other logbook programs. Some states have logbook programs to collect similar information as required in the federal HMS logbook, although participants reporting through state programs must still provide these data to the Federal government.

All swordfish dealer permit holders must submit bi-weekly dealer reports on all HMS they purchase. To facilitate quota monitoring, “negative reports” for swordfish are also required from dealers when no purchases are made. The United States has recently implemented a program to require all Federally-permitted Atlantic HMS dealers to report purchases of HMS through an electronic reporting system. This program includes additional “first receiver” rules, which would require that the first individuals to receive product from fishermen have a dealer permit and report in the electronic dealer system.

A combination of both generalized surveys covering all species and more specialized data collection programs focused specifically on HMS are required of recreational permit holders. In addition, a planned national registry of saltwater anglers will improve recreational survey efficiency and data quality. All non-tournament recreational landings of swordfish and billfish must be reported by telephone or online within 24 hours of landing by the permitted owner of the vessel landing the fish. Tournament operators are required to report the results of their tournament to the Southeast Fisheries Science Center in Miami, FL, if the tournament is selected for reporting. If a tournament is not selected, vessel owners are responsible for reporting their swordfish landings.

Monitoring & Reporting Compliance

The United States has implemented a fleet-wide VMS requirement in the Atlantic pelagic longline fishery which requires all vessels away from port with pelagic longline gear onboard to operate their VMS units.

The U.S. observer coverage goal is eight percent of all sets in each area/quarter stratum. The achieved observer coverage of the U.S. longline fleet from 2004 through 2012 ranged from 6.9 to 18.1 percent of the fishing sets deployed, and in 2014, it was 12.9 percent. If the U.S. Observer Program coordinator sends a letter to fishermen notifying them that they have been selected to carry an observer aboard their vessel, the fishermen must inform NMFS when they will be taking a trip. If that trip is selected, a NMFS observer must be onboard in order for that vessel to go fishing. For additional information, please refer to the report on domestic observer programs submitted by the United States pursuant to ICCAT Recommendation 10-10.

Effective June 1, 2015, an owner or operator of a commercial vessel permitted or required to be permitted in the Atlantic Tunas Longline category and that has pelagic longline gear on board that vessel have installed, operate, and maintain an electronic monitoring system on the vessel to audit reports of bluefin tuna interactions.

Bycatch Reduction

The United States has taken numerous actions since 1999 designed to reduce interactions with non-target species, undersized fish, and protected species such as sea turtles and marine mammals. Some of these actions include time/area closures, gear restrictions (including hooks, baits, gangion length, and a maximum length for longlines in certain areas), and requiring that all swordfish directed or incidental permit holders using longline gear attend a Protected Species Safe Handling, Release and Identification Workshop. At least one operator onboard these vessels, if different from the permit holder, must also attend the workshop.

Enforcement of Swordfish Regulations

U.S. Atlantic enforcement for ICCAT-managed species is undertaken by the NOAA Office of Law Enforcement (OLE), the U.S. Coast Guard, and, pursuant to cooperative enforcement agreements, by States and territories with maritime boundaries in the Atlantic Ocean, Gulf of Mexico, and/or Caribbean Sea. At-sea boarding and inspection activities monitor for compliance with gear requirements, bycatch, and size restrictions. Enforcement activities also include monitoring and inspecting offloads at landing facilities and marinas in conjunction with dealer record checks and significant recordkeeping and reporting requirements. Enforcement of pelagic longline time/area closures is accomplished by monitoring VMS signals as well as at-sea enforcement patrols.

NOAA provides oversight for several import monitoring programs to ensure that fisheries products entering the U.S. marketplace are harvested in a manner consistent with international agreements and domestic standards for sustainable fishing and protected species conservation. Several NMFS offices are involved in these import monitoring programs including the Silver Spring, MD, Offices of International Affairs, Sustainable Fisheries, Law Enforcement and Protected Resources. Much of the work involving data collection, permitting of importers and admissibility determinations is conducted out of NMFS Regional Offices in Gloucester, MA, Long Beach, CA, and

the National Seafood Inspection Laboratory (NSIL) in Pascagoula, MS. These efforts also include implementation of ICCAT requirements, including the ICCAT Statistical Document and other permitting and reporting requirement for U.S. importers. As needed in cases of targeted enforcement, OLE special agents work in partnership with Customs and Border Protection officials to address importation violations concerning swordfish.

OLE has implemented enhanced procedures for handling referrals of International Trade Permit violations by the NMFS trade monitoring program for swordfish. NMFS swordfish trade monitoring staff operating out of NSIL performs routine monitoring for dealer compliance regarding permitting and required reporting. Where suspected technical violations are detected concerning permitting or reporting, NSIL staff initiates first contact with the dealer or their authorized agent, and attempt to gain compliance. Where non-compliance continues, suspected violations are documented and forwarded to OLE for review and, where appropriate, further enforcement action. Enforcement emphasis is directed towards those who are illegally importing swordfish without an ITP permit, failing to submit required statistical documents, attempting to subvert an embargo, or introducing IUU product into the United States. These enforcement priorities are designed to ensure appropriate monitoring for compliance with ICCAT conservation measures and international obligations. The NOAA OLE works closely with NSIL and the NOAA Office of General Counsel to take appropriate enforcement action as needed to ensure compliance.

V. Social and Economic Considerations

The U.S. commercial swordfish fishery supports a high-value processing and trade (domestic and international) sector worth millions of dollars. Valuable tuna species are also caught in conjunction with swordfish, thereby increasing the value of these important multispecies fisheries. The U.S. swordfish fishery also provides significant social and economic benefits to coastal communities by supporting both commercial and recreational fishermen, dealers, and shore-based businesses (e.g., mechanics, marinas, boat builders, gear manufacturers, electricians, bait and tackle shops, fuel suppliers, hotels, and restaurants). In 2012, there were approximately 11 million recreational saltwater anglers across the United States who took 72 million saltwater fishing trips around the country. These anglers spent \$4.6 billion on fishing trips and \$20 billion on durable fishing-related equipment. These expenditures contributed \$58 billion in sales impacts to the U.S. economy, generated \$30 billion in value added impacts, and supported over 381,000 job impacts.¹

In 2012, the U.S. seafood industry (Atlantic and Pacific, including harvesters, processors, dealers, wholesalers and distributors, importers, and retailers) supported approximately 1.3 million full- and part-time jobs and generated \$141 billion in sales impacts, \$39 billion in income impacts, and \$59 billion in value added impacts. Commercial fishermen in the U.S. harvested 9.6 billion pounds of finfish and shellfish in 2012, earning \$5.1 billion for their catch.

U.S. imports of swordfish from all sources far exceed the level of domestic production from the Atlantic and Pacific. The U.S. market for swordfish is completely open to international competition with a zero import tariff for all product forms of swordfish, in contrast with other ICCAT members whose tariffs range as high as 18 percent. As with other major import markets, the United States has a keen interest in seeking to ensure that its imports are from sustainable fisheries that are carefully managed and monitored.

Social and Economic Considerations for Local U.S. Communities

The United States utilizes research studies, industry statistics, and constituent feedback to identify participants and communities that are heavily dependent upon the swordfish fishery. This process provides information on the social importance of the swordfish fishery to coastal communities and participants. The United States also tracks operating costs for the U.S. swordfish fishery via logbook reporting and voluntary submissions of the trip expense and payment section of the logbook form from non-selected vessels. The primary expenses associated with operating a swordfish commercial vessel include labor, fuel, bait, ice, groceries, other gear, and light sticks. Operating costs, in general, have increased in recent years.

¹ These figures are national estimates.

Average ex-vessel prices, landings and total revenue from swordfish are shown in Table 2 (NMFS, 2013). As described above, U.S. landings of swordfish have gradually increased since 2006, due to efforts to sustainably revitalize the fishery. Despite this increase in landings, annual swordfish revenues have fluctuated due to changes in ex-vessel price. In recent years, U.S. market prices have been depressed by imports from nations that do not have comparable bycatch requirements or costs associated with regulatory compliance. It is hoped that U.S. efforts to promote comparable conservation standards around the world will strengthen U.S. market prices for swordfish and thereby encourage greater U.S. harvests. In 2013, the average ex-vessel price for swordfish was US\$4.68/lb dw.

Table 2. U.S. Average Swordfish Ex-Vessel Price, Landings, and Fishery Revenue

Species		2007	2008	2009	2010	2011	2012	2013
Swordfish	Ex-vessel \$/lb dw	\$4.02	\$3.63	\$3.46	\$4.41	\$4.51	\$4.41	\$4.68
	Weight (lb dw)	3,643,926	3,414,513	3,762,280	3,676,324	4,473,140	5,561,605	4,366,578
	Fishery Revenue in \$US	14,648,583	12,565,408	13,017,489	16,212,589	20,173,861	24,534,334	20,535,723

Swordfish are sold fresh and frozen in dressed form and as processed products (e.g., steaks and fillets). As an important commodity on world markets, swordfish can generate significant export earnings for U.S. companies. Employment varies widely among processing firms, but over 35,700 people are employed in processing or wholesale businesses that are involved with the production of HMS, including swordfish. Often employment is seasonal unless the firms also process imported seafood or a wide range of domestic seafood.

The commercial U.S. swordfish fleet is comprised of both distant water ships that follow the swordfish through its migration, and ships that target swordfish as they become seasonally available in specific regions. There are currently 249 pelagic longline vessels that are licensed to fish for Atlantic swordfish. For various reasons, not all licensed vessels are authorized to fish in the fishery each year. The U.S. Atlantic distant water fleet, which is based out of ports between Puerto Rico and Maine, covers the western North Atlantic. Some large vessels fishing in distant waters operate out of Mid-Atlantic and New England ports during the summer and fall months targeting swordfish and tunas, and then move to Caribbean ports during the winter and spring months. Many of the current distant water vessels were among the early participants in the U.S. directed Atlantic commercial swordfish fishery. These large vessels, with greater ranges and capacities than coastal fishing vessels, enabled the United States to become a significant participant in the North Atlantic swordfish fishery.

Landings of swordfish tend to vary regionally but have increased in southern communities over the past decade. According to a recent analysis (MRAG Americas, Inc. 2008), the communities with the greatest annual landings in 2006 include: Dulac, Louisiana (165.7 mt ww); Wanchese, North Carolina (140.2 mt ww); Beaufort, North Carolina (107 mt ww); Barnegat Light, New Jersey (88.8 mt ww) and, New Bedford, Massachusetts (60.7 mt ww). Based on the average ex-vessel price for 2006, this equated to estimated direct sales impacts of \$1,293,294 in Dulac, Louisiana; \$1,093,917 in Wanchese, North Carolina; \$835,192 in Beaufort, North Carolina; \$693,156 in Barnegat Light, New Jersey; and \$474,107 in New Bedford, Massachusetts.

The communities with the greatest average number of swordfish landed per year, between 1999 and 2010, include Dulac, Louisiana (3,857 SWO/yr); Fairhaven, Massachusetts (3,215 SWO/yr) which is adjacent to New

Bedford, Massachusetts (1,907 SWO/yr); Ft. Pierce, Florida (3,215 SWO/yr); Wanchese, North Carolina (3,121 SWO/yr); Wadmalaw Island, South Carolina (2,632 SWO/yr); Barnegat Light, New Jersey (2,586 SWO/yr); San Juan, Puerto Rico (2,297 SWO/yr); and Beaufort, North Carolina (2,209 SWO/yr). Significant commercial and recreational swordfish fisheries also occur along the east coast of Florida including Pompano Beach, Florida and Islamorada, Florida.

Fishing in the New England and mid-Atlantic regions has evolved during recent years to focus almost year-round on directed tuna trips, with substantial numbers of swordfish trips as well. Some vessels participate in directed bigeye/yellowfin tuna fishing during the summer and fall months and then switch to bottom longline fishing during the winter when the large coastal shark season is open. During the season, vessels in this region primarily offload in the ports of New Bedford, Massachusetts; Barnegat Light, New Jersey; Ocean City, Maryland; and Wanchese, North Carolina.

In New England, the communities of Gloucester and New Bedford, Massachusetts, are heavily invested in the swordfish fishery and serve as a home port for many distant water vessels. Both have significant infrastructure investments in processing and distribution facilities. New Bedford has become increasingly dependent on high-value species such as swordfish, sea scallops (*Placopecten magellanicus*), and groundfish as the city's manufacturing base has declined. Several fishing communities in the mid-Atlantic (e.g., Barnegat Light, New Jersey; Wanchese, North Carolina; and, Hatteras, North Carolina) are also heavily dependent on the fishing industry to support the local economy. Half of Barnegat Light's 300 person civilian workforce and 1/3 of Hatteras' civilian workforce are employed in the fishing industry. Recent investments by the state of North Carolina into an industrial seafood park in the town of Wanchese demonstrate a commitment to the fishing industry in that region.

The New England and mid-Atlantic swordfish fisheries must comply with time-area closures and measures to protect bycatch. In 1999, NMFS closed the Northeastern U.S. area in June to pelagic longline gear to reduce bluefin tuna discards. Additionally, in 2009, NMFS published the final Pelagic Longline Take Reduction Plan to protect pilot whales and Risso's dolphins which included, among other measures, a requirement that pelagic longline vessel operators fishing in the Cape Hatteras Special Research Area contact NMFS at least 48 hours prior to a trip, and carry observers, if requested.

Off the southeastern coast of the United States, pelagic longline vessels target swordfish year-round although yellowfin tuna (*Thunnus albacores*) and dolphin fish (*Coryphaena hippurus*) are other important marketable components of the catch. Some mid-sized and larger vessels based out of ports in the southeastern United States migrate seasonally on longer trips from the Yucatan Peninsula throughout the West Indies and Caribbean Sea, and some trips range as far north as the Mid-Atlantic coast of the United States to target bigeye tuna (*Thunnus obesus*) and swordfish during the late summer and fall. Home ports (including seasonal ports) for this fishery include, but are not limited to, Georgetown, South Carolina; Charleston, South Carolina; Fort Pierce, Florida; Pompano Beach, Florida; and Key West, Florida. Smaller vessels fish short trips from the Florida coast and typically sell fresh swordfish to local markets.

Florida has the greatest number of commercial swordfish permit holders (155). Florida also has the greatest number of swordfish dealers with 88 permitted in 2014. Following the implementation of the East Florida Coast pelagic longline closure in 2001, some commercial swordfish effort in this area has shifted to the commercial handgear sector. The recreational swordfish fishery in Florida has also grown significantly since 2003. Many coastal communities in Florida are invested in recreational fishing through the charter/headboat industry and supporting businesses.

Tournaments provide a significant economic benefit and marketing device to many coastal communities, especially in southeastern Florida, and have increased in popularity as the stock has recovered. In 2013, 42 tournaments targeting swordfish in the United States were registered. Events include the Miami Swordfish Tournament and the Key West Summer Swordfish tournament. These tournaments can generate a substantial amount of money for surrounding communities and local businesses. Less direct, but equally important, fishing tournaments may serve to generally promote the local tourist industry in coastal communities. Islamorada, FL, for

example, is heavily dependent upon tourism, and has over 45 hotels/motels and 24 marinas to support recreational fishing activities.

Gulf of Mexico pelagic longline vessels primarily target yellowfin tuna year-round but may also catch and sell swordfish. A handful of these vessels directly target swordfish, either seasonally or year-round. Many of these vessels participate in other Gulf of Mexico fisheries (targeting shrimp, shark, and snapper/grouper) during allowed seasons. Home ports for this fishery include, but are not limited to, Madeira Beach, Florida; Panama City, Florida; Dulac, Louisiana; and Venice, Louisiana. Dulac is one of the most important fishing ports in the state of Louisiana, and consistently ranks high in landings of swordfish, tunas, and sharks.

The U.S. Caribbean fleet is similar to the southeastern U.S. pelagic longline fleet in that it consists primarily of smaller vessels making short, relatively near-shore trips, producing high quality fresh product. The U.S. Caribbean fleet has historically landed swordfish and tunas that support the tourist trade in the Caribbean.

VI. Swordfish Research

The United States also makes a significant contribution to the conservation and management of stocks through the collection and provision of scientific data to the Standing Committee on Research and Statistics (SCRS), active participation in stock assessments, joint research activities, and capacity building initiatives. Scientists from Canada, Venezuela, U.S. (Southeast Fisheries Science Center), Spain, South Africa, Brazil, and Greece jointly published a review of the factors contributing to the rebuilding success of North and South Atlantic swordfish stocks. The authors concluded that coupled effects of swordfish biology (including relatively fast growth, and spatially- and temporally-dispersed spawning), positive management actions, and a period of relatively good recruitment were essential factors resulting in stock rebuilding. The researchers describe the challenges that must be faced and measures that must be taken to maintain the stocks, including risk adverse assessment and management measures.

Researchers from National Taiwan University, University of Maine, and the U.S. Pacific Islands Fisheries Research Center published a habitat suitability model to identify optimal swordfish habitat in the equatorial Atlantic Ocean. The authors reported that swordfish aggregated in the northwest equatorial region during March–May and spread southeast thereafter in response to seasonal shifts in oceanographic conditions. They documented annual variation in the distribution of habitat patches, with reduced habitat quality in the northwest region of the equatorial Atlantic Ocean during 2005. They suggest that the apparent spatial shifts in optimal habitats might be linked to reduced mixed layer depth and elevation in sea surface height, which might be related to climate variability (e.g. Niño-Southern Oscillation and/or Northern Atlantic Oscillation). The authors propose that the habitat models may be used to evaluate possible changes in habitat suitability resulting from climate change and provide scientific advice for the development of management regulations.

U.S. scientists from the University of Miami, Nova Southeastern University, and the Southeast Fisheries Science Center published on movement and habitat use information of eight satellite archival tagged fish in the Western Atlantic Ocean. They documented cycles in vertical habitat use patterns, and suggested that swordfish resided primarily below the thermocline during the day and migrated closer to the surface at night, with vertical movements between the surface and depth occurring during twilight hours. Results also supported the hypothesis that swordfish activity varies in relation to moon phase.

U.S. anglers participating in the cooperative tagging program marked 49 swordfish captured in recreational fisheries off the U.S. East Coast and reported recapture information on 8 fish. The recaptured swordfish demonstrated regional site fidelity, with six fish released and recaptured off the east coast of Florida, over a range of times at liberty between 235 and 3,106 days. One swordfish was recaptured in the Northeast distant waters, initially released in the Grand Banks region over 1,200 kilometers away from the recapture location, with a time at liberty of nearly 15 years. One swordfish was recaptured off the coast of Delaware that was originally tagged off the coast of North Carolina, approximately 500 kilometers away, with a time at liberty of 961 days. The recapture of tagged fish with long-time at liberty provide valuable data for validation of longevity, stock spatial structure, and growth estimates.

U.S. and Canadian scientists collaborated on a joint analysis to assess longline gear configuration effects on swordfish catches, to validate prior estimates of gear effects on catch indices. Specifically, a combined analysis of data from the two fleets provided contrast in catch data under different gear configurations, and produced preliminary estimates of the combined effect of hook and bait type on swordfish catch indices used in the assessment.

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