Atlantic Highly Migratory Pelagic Fisheries

OAR/National Undersea Research Program

Unit

5

GUILLERMO A. DIAZ

NMFS Office of Science and Technology

Silver Spring
Maryland

Photo above:
School of yellowfin tuna in the Gulf Stream of the Atlantic Ocean.

INTRODUCTION

Oceanic pelagic fish are highly migratory species (HMS) that include swordfish, bluefin tuna, yellowfin tuna, bigeye tuna, albacore, skipjack tuna, blue and white marlin, sailfish, longbill spearfish, a variety of sharks (see Unit 6, Atlantic Shark Fisheries), and others. In the Atlantic Ocean, swordfish and bluefin tuna have long been the target of important fisheries. Since the early 1980's, yellowfin tuna and swordfish comprise the majority of the U.S. landings of tunas and tuna-like species. Landings of bigeye tuna also increased in the 1980's but represented a much lower proportion of total U.S. landings. Many recreational anglers target yellowfin tuna, bluefin tuna, blue marlin, white marlin, and sailfish in U.S. waters. Swordfish has also become a target of recreational fishermen in the past few years.

Although some HMS are not directly targeted by commercial fisheries, they are incidentally caught in some of them. For example, blue and white marlin, sailfish, and longbill spearfish are incidentally caught in longline fisheries for tuna and swordfish. However, as a conservation measure, landings of these species by commercial fishermen have been prohibited in U.S. waters since 1988.

Because these large pelagic fish migrate widely and are harvested over broad ocean areas by both U.S. and foreign fishermen, national and international management measures are necessary. In all cases, stock assessments are conducted using aggregate data and provide the basis for regulations. U.S. fleets operate in the western Atlantic

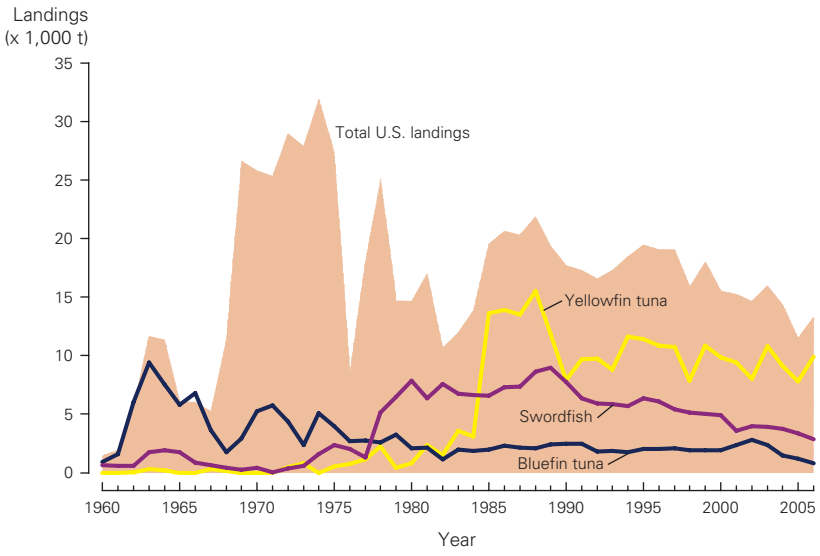

Figure 5-1
U.S. landings in metric tons (t) of Atlantic highly migratory pelagic species, 1960–2006.

Ocean, Caribbean Sea, and Gulf of Mexico and are regulated under the Magnuson-Stevens Fishery Conservation and Management Act and the Atlantic Tunas Convention Act (ATCA). Management of Atlantic tunas and swordfish in U.S. waters is based largely on recommendations by the International Commission for the Conservation of Atlantic Tunas (ICCAT) and implemented via regulatory articles under the ATCA. In the case of bluefin tuna, ICCAT has set and allocated quotas for the western stock by country since 1982 and for the eastern stock since 1994. Catch limitations were first established for North Atlantic swordfish in 1991 and South Atlantic swordfish in 1994; country-specific quotas have since been adopted for both stocks. ICCAT has additionally recommended reductions in billfish catches for all nations since 1997. Atlantic highly migratory pelagic species were formerly managed under two separate U.S. Fishery Management Plans (FMPs), the Atlantic Tunas, Sharks, and Swordfish FMP and the Atlantic Billfish FMP. In 2006, the new Consolidated Atlantic Highly Migratory Species FMP merged the management of all HMS stocks under a single plan.

SPECIES AND STATUS

Total landings of tuna and tuna-like species by U.S. fishermen increased from the early 1960's through the mid 1970's. Total U.S. landings peaked in 1975 with approximately 32,000 metric tons (t; Figure 5-1). Through 1967 the majority of the highly migratory species landings were bluefin tuna; although variable, landings of yellowfin tuna have tended to dominate since then. Swordfish landings showed an important increase from the mid 1970's until about 1990 and have been in a constant decline since then. Overall, landings by U.S. fishermen have steadily declined since 1988.

The U.S. share of current yield of the highly migratory pelagic fish stocks is about 13,300 t/year (Table 5-1; ICCAT, 2007). Since 1960, the top species by volume in the U.S. harvest has changed from bluefin tuna to swordfish to yellowfin tuna (Figure 5-1), with fishing effort shifting between these species as their abundance declined due to fishing pressure. During the 1960's, bluefin tuna represented up to 80% of the U.S. western Atlantic catch of large pelagics. However, that percentage has dropped to less than 15% since 1980, reflecting declines in the bluefin tuna population, catch restrictions, and increasing harvests of alternative species. Swordfish represented up to 20% of the U.S. catch during the 1960's, but during most of the 1970's swordfish constituted a very low percentage of U.S. landings. Swordfish landings increased toward the end of the decade and climbed to 51% in 1982, but have since dropped to about 15–20%. From the early to mid 1960's, the percentage of yellowfin tuna in the U.S. north Atlantic catch was less than 2%; levels have risen to 40–50% since 1980. The U.S. dockside ex-vessel revenue from these fisheries soared from about $30 million in the early 1980's to nearly $100 million in 1988, but has declined to roughly $60 million in recent years.

Recreational angler harvests of large pelagic fishes are estimated from dockside and telephone surveys. The average annual landed catch by recreational anglers for 2004–06 is conservatively estimated at about 7,500 t. Surveys of fishing tournaments indicate a substantial increase in recreational billfish fishing since 1972. Although the practice of tagging and releasing large pelagic fish has become common in recent years, additional data are needed to quantify the recreational fishery trends for these species in U.S. Atlantic and Gulf of Mexico waters. The value of U.S. recreational fisheries for highly migratory species has not been

Species/stock	Recent average yield (RAY)[1]	Current yield (CY)[2]	Sustainable yield (MSY)	Stock level relative to B_{MSY}	Harvest rate	Stock status
Albacore (N. Atlantic)	32,400	36,077	26,800–34,100	Near	Overfishing	Overfished
Bigeye tuna (Atlantic)	74,500	64,700	68,000–99,000	Near	Not overfishing	Rebuilding
Blue marlin (Atlantic)	2,500	2,060	Unknown	Below	Overfishing	Overfished
Bluefin tuna (W. Atlantic)	1,900	1,929	3,000–3,400	Below	Overfishing	Overfished
Sailfish (W. Atlantic)	900	697	Unknown	Unknown	Overfishing	Overfished
Skipjack tuna (W. Atlantic)	26,900	25,802	Unknown	Unknown	Unknown	Unknown
Swordfish (N. Atlantic)	12,000	11,445	12,800–14,790	Near	Not overfishing	Rebuilding
White marlin (Atlantic)	400	342	Unknown	Below	Overfishing	Overfished
Yellowfin tuna (Atlantic)	109,700	103,908	~148,000	Near	Not overfishing	Appr. overfished
Other tunas (Atlantic)[3]	29,021	35,230	Unknown	Unknown		
Total	290,221	282,190				
U.S. Subtotal	18,569	13,305				

[1]2004–06 average from ICCAT Task 1 data as of 5 October 2007. Total includes landings by U.S. and foreign nationals.

[2]From ICCAT data. Based on the entire stock regardless of the harvesting nation.

[3]Harvest rate and stock status are not available for this stock.

Table 5-1
Productivity in metric tons (t) and status of highly migratory pelagic fisheries in U.S. waters of the Atlantic Ocean.

estimated for all stocks; however, preliminary estimates indicate that they are highly valued.

The National Marine Fisheries Service (NMFS) has classified the following Atlantic HMS stocks as overfished: West Atlantic bluefin tuna, North Atlantic albacore, West Atlantic sailfish, blue marlin, and white marlin (Table 5-1). Swordfish and bigeye tuna are rebuilding following past overfishing, while Atlantic yellowfin tuna is approaching an overfished condition. The Consolidated Atlantic Highly Migratory Species FMP addresses rebuilding and/or overfishing of depleted stocks and also includes measures designed to maintain healthy stocks at the optimum yield and begin the process to update essential fish habitat. Fishing mortality rates on swordfish have been excessive since the late 1970's, prompting the development of international agreements to substantially reduce catches and the risk of further declines, beginning in 1991. U.S. harvests of swordfish since July 1991 have been consistent with ICCAT's recommendations. As a result, the last assessment of North Atlantic swordfish showed that the stock is almost rebuilt and is no longer experiencing overfishing. Western Atlantic bluefin tuna have been overharvested to the point of being severely depleted, and as a result the harvest of this species has been restricted since 1982. Stock status projections prepared during the 2006 stock assessment indicated that the 2,100 t quota established in 2007 should result in a slight increase of the spawning stock in the near future. No catch quotas are currently in place for either of the fully utilized yellowfin and bigeye tuna stocks.


Allen Shimada, NMFS

Circle hooks on longlines arranged and ready for deployment.

ISSUES

Transboundary Stocks

Regulation of species that migrate across international boundaries is difficult. U.S. domestic regulations without international agreements are inherently limited, but international agreements can be difficult to achieve. The latter is particularly true if the primary fishing nations cannot agree on commonly shared fishing and conservation objectives, or do not abide by agreements once they are adopted. Additionally, not all nations participating in HMS fisheries belong to the international regulatory body, ICCAT. The United Nations agreement on straddling fish stocks and highly migratory fish stocks may help resolve these problems.

Bycatch and Multispecies Interactions

Bycatch of Atlantic highly migratory species causes conflicts between commercial and recreational fisheries, and reduces the impact of conservation efforts. Marlin and sailfish bycatch in tuna and swordfish fisheries is a major concern, especially when these commercial fisheries encounter concentrations of billfish that are important to

Allen Shimada, NMFS

Bigeye tuna.

recreational anglers. Expansion of the U.S. longline fishery for Gulf of Mexico yellowfin tuna, and other nations' longline fishing in the tropical eastern Atlantic, have heightened concern for distressed stocks of Atlantic tunas and billfish. Bycatch of marine mammals, sea birds, and sea turtles is an important issue for the pelagic longline fishery. In 2004, the use of circle hooks in the U.S. Atlantic longline fishery became mandatory as a mitigation measure to reduce the bycatch of sea turtles. Research is currently underway to better characterize the interactions of this fleet with sea mammals and sea birds.

Domestic Management

Although the number of U.S. permits in large pelagic fisheries increased substantially during the 1990's, actual levels of effort in the longline fishery have declined in recent years. In order to reduce latent effort and prevent future expansion of the fleets, NMFS has put into place a limited-access permit system for Atlantic swordfish, shark, and tuna longline fisheries.

Since 1999, multiple areas in the Gulf of Mexico and the Atlantic Ocean have been closed to U.S. longline fishing for 1–2 months each year for the purpose of reducing bycatch of small swordfish, marlins, sea turtles, and bluefin tuna. In some of those areas, scientifically designed experimental fishing has been and is being conducted to study factors influencing bycatches.

Progress

In recent years, scientists from the United States and several other nations have made substantial progress towards improved understanding of the biological basis for managing Atlantic highly migratory fisheries. Analyses of the genetic structure of Atlantic and Mediterranean swordfish have been completed and have corroborated some of the stock structure assumptions made by ICCAT. Additionally, several years of research on the growth and reproductive biology of male and female swordfish has increased the understanding of fishing effects on both north Atlantic and Mediterranean management stock units. Genetic studies of other large pelagic species, bluefin tuna in particular, are underway. Additional studies of bluefin tuna stock structure using various tagging methods and biological markers (such as otolith micro-constituents) are in various stages of implementation. Preliminary results have corroborated the stock structure assumptions made by ICCAT. These assumptions include the existence of a western stock with spawning grounds in the Gulf of Mexico and an eastern stock that spawns in the Mediterranean Sea. There is an undetermined degree of mixing between both stocks, but fish that originated in one spawning ground always return to the same site to spawn.

LITERATURE CITED

ICCAT. 2007. Report of the Standing Committee on Research & Statistics (SCRS), International Commission for the Conservation of Atlantic Tunas, 1–5 October 2007, Madrid, Spain. Internet site—http://www.iccat.int/Documents/Meetings/Docs/scrs_report_eng_all_oct_16.pdf.