

FINAL
ATLANTIC HMS MANAGEMENT-BASED RESEARCH
NEEDS AND PRIORITIES

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**Highly Migratory Species Management Division
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ATLANTIC HMS MANAGEMENT-BASED RESEARCH NEEDS AND PRIORITIES

This document was developed by the Highly Migratory Species (HMS) Management Division of the National Marine Fisheries Service (NOAA Fisheries or the Agency) to communicate key research needs that directly support Atlantic HMS management. Atlantic HMS are defined as bluefin, bigeye, albacore, yellowfin, and skipjack tunas, swordfish, billfish (blue marlin, white marlin, roundscale spearfish, longbill spearfish, and sailfish), and sharks. The document contains a list of near- and long-term research needs and priorities that can be used by individuals and groups interested in Atlantic HMS to identify key research needs, improve management, reduce duplication, prioritize limited funding, and form a potential basis for future funding. The priorities range from biological/ecological needs to socio-economic needs. NOAA Fisheries accepted public comment on a draft document (79 FR 39367; July 10, 2014); specific comments on priority levels for some research needs as well suggestions to include additional research needs are reflected in this final document.

This document is one of several efforts to highlight key research needs for Atlantic HMS. One early effort, the HMS Research Plan, was developed by NOAA Fisheries scientists across HMS disciplines in response to discussions at HMS Advisory Panel (AP) meetings. The HMS AP was interested in identifying specific research needs based upon known data gaps, however, the HMS AP felt that early versions of the HMS Research Plan needed more specificity with clear prioritization. Further revisions to that document are underway. This document complements the HMS Research Plan currently in draft and, although of different purpose, some aspects of the HMS Research Plan were included in this document. Other efforts are also underway in the Agency to identify key research needs relevant to Atlantic HMS management, such as the National Recreational Action Agenda and Regional Plans and the National Bycatch Reduction Engineering Program.

At this time, specific funding for the priorities outlined in this document has not been identified. However, the Agency is currently undergoing a strategic review of both management and science planning processes and resource allocations. This document will inform the strategic review of management planning and resource allocations. Additionally, there are several Requests for Proposals (RFPs) that support different types of competitively awarded funds for research. Some of these RFPs include funds for the Bycatch Reduction Engineering Program (BREP), Cooperative Research Program (CRP), and Saltonstall-Kennedy Grant Program (SK). More information on these RFPs is available on the NOAA Fisheries website. This priorities document may be used by interested scientists who are applying for these or other funds as a way to highlight the need for the research.

While some of the priorities were derived from stock assessment reviews, other priorities were identified while developing and proposing management measures. Many of the research priorities address key data gaps and/or ways to reduce fishing mortality and/or bycatch to more effectively manage HMS fisheries, either directly or by improving stock assessments. Because these needs were identified by fishery managers, these research priorities may not correspond

directly with the research priorities and needs identified by the scientists throughout NOAA Fisheries.

Ongoing survey and monitoring programs are not discussed unless there is a specific suggestion for expansion of an existing program. These survey and monitoring programs, which include but are not limited to shark nursery and essential fish habitat studies, fishery-independent surveys, and observer programs, are vital to stock assessments and effective HMS management. These ongoing survey and monitoring programs should be considered high priority.

Except for those priorities that are applicable across all Atlantic HMS, the list is broken down by species or species group. These research priorities are further characterized as high, medium, or low priority depending upon the needs identified by the managers and refined based on public comment on a draft of this document. High priority items are generally those that are needed to address near-term stock assessment or management needs. Medium priority items are generally those that address longer-term needs, while low priority needs would provide for more effective HMS management, despite lacking an immediate need. Within the high, medium, or low priorities lists, the needs are not prioritized.

Priorities for All Atlantic HMS

High Priorities

- Provide estimates of post-release mortality of all HMS across gear types. For bluefin tuna, provide estimates by year class. For sharks, focus on commercially and recreationally important shark species or species that are frequently caught as bycatch.
- Assess the impact of weak hooks on pelagic longline gear in the Gulf of Mexico and possible impacts of expanding weak use requirement to the Atlantic Ocean; focus on minimizing bycatch (e.g., bluefin tuna, white marlin, dusky sharks, marine mammals) while maintaining or increasing target catch (e.g., swordfish; bigeye, albacore, yellowfin, or skipjack tunas).
- Assess the long-term ecological and socioeconomic impacts of closed areas for HMS.
- Characterize the socioeconomic status of all recreational and commercial HMS fisheries, by region.
- Calculate fishing mortality and interactions of HMS in non-HMS fisheries (e.g., in the dolphin/wahoo fishery, shrimp trawl fishery).
- Examine the feasibility of gear alternatives in Gulf of Mexico and Atlantic Ocean to reduce bycatch while maintaining target catch (e.g., feasibility of buoy gear for bigeye, albacore, yellowfin, and skipjack tunas, particularly bycatch characterization).
- Assess long-term socioeconomic and ecological impacts of the Deepwater Horizon oil spill.
- Assess the socioeconomic impacts of the new Swordfish General Commercial and Caribbean Commercial Small Boat permits on new and existing tuna and swordfish handgear fisheries.

Medium Priorities

- Assess the possibility of ecosystem-based assessments and explore the feasibility of ecosystem-based management for all HMS.
- Collect data that would allow for all HMS essential fish habitat designations to be based on more than presence/absence data.
- Examine the influence of climate change on range, migration, nursery/pupping grounds, and prey species for HMS in general.
- Improve HMS landings reports from U.S. Caribbean, other countries, and elsewhere. For sharks, include landings reports from countries that may share domestically-assessed shark stocks.

Low Priorities

- Examine the effects of mercury warnings on consumer perceptions and consumption of HMS.
- Examine the effects of seafood certification or labeling on consumer perceptions and consumption of HMS.

Bluefin Tuna

High Priorities

- Determine the western Atlantic stock-recruitment relationship (i.e., low vs. high recruitment) and implications for management.
- Refine western Atlantic bluefin tuna growth rate and age of maturity.
- Assess the effects of eastern and western stock mixing on stock assessment results and implications for management.
- Determine predator/prey relationships and forage availability.
- Enhance information on larval distribution to support stock assessments.
- Determine seasonal migration and localized abundance information including size, distribution, and stock structure.

Medium Priorities

- Develop in-field, rapid genetic identification techniques to distinguish between species (e.g., are “blackfin” or “bigeye” landings actually juvenile or adult bluefin tuna, respectively).

Low Priorities

- Examine the feasibility of dynamic area management based on oceanic conditions.

BAYS (Bigeye, Albacore, Yellowfin, and Skipjack) Tunas

High Priorities

- Determine seasonal migration and localized abundance, distribution, stock structure.

Medium Priorities

- Determine predator/prey relationships and forage availability.
- Determine larval distribution.
- Develop in-field, rapid genetic identification techniques to distinguish between species (e.g., are “blackfin” or “bigeye” landings actually juvenile or adult bluefin tuna, respectively).

Billfish

High Priorities

- Improve life history information, including differences between white marlin and roundscale spearfish.
- Determine white marlin and roundscale spearfish species composition in current and historical catch data.
- Determine spawning areas and spawning seasonality, seasonal migration and localized abundance, distribution, and stock structure.
- Collect additional catch and mortality information for stock assessment, particularly for sailfish.

Medium Priorities

- Determine predator/prey relationships and forage availability.
- Determine larval distribution.
- Determine age structure and age at length conversions

Swordfish

High Priorities

- Investigate ways to reduce bycatch and bycatch mortality of non-target species in the directed swordfish fisheries with particular emphasis on pelagic longline gear. Non-target species of concern include sea turtles, bluefin tuna, and some overfished shark species.

Medium Priorities

- Determine the sales pathways and socioeconomic impacts of illegally sold swordfish and determine if such illegal sales affect consumer perceptions and consumption of swordfish.
- Determine seasonal migration and localized abundance, distribution, and stock structure.
- Characterize and assess impacts of the deep-drop fishery on large (>about 350 lb.) swordfish.
- Determine age structure and age at length conversions
- Determine spawning areas and age at maturity

Low Priorities

- Determine larval distribution.

Sharks

High Priorities

- Provide estimates of at-vessel mortality in all fisheries for all shark species, particularly primary commercial and recreational species or species that are caught as bycatch frequently.
- Determine migration and stock structure of all sharks. Consider implications for assessments and management of stocks that straddle multiple national jurisdictional boundaries (e.g., Mexico, Caribbean nations, and the United States).
- Determine social and economic impacts on the shark fishery as a whole due to state shark fin possession bans and shark fin consumption/trade.
- Determine catch rates in commercial and recreational fisheries of sharks using J and circle hooks while considering bycatch rates of non-target species.
- Improve life history information of all sharks, particularly commercially and recreationally important species or species that are caught as bycatch frequently (i.e., fecundity, sex-specific age/length of maturity, pupping grounds, mating grounds, gestation period, reproductive frequency, maturity ogive, number of pups, etc); determine if these characteristics have changed over time.
- Enhance observer coverage in all fisheries, including non-HMS fisheries; record shark species to the species level at a minimum (e.g., not “shark” or “large coastal shark”); improve observer data for shark species by including gear-related (e.g., hook types, soak time, etc) and species-related information (e.g., length of shark, gender, disposition, etc.)

Medium Priorities

- Identify key nursery habitats.
- Calculate average weight of and conversion factors for different landing conditions (dressed, whole, fins attached), particularly for primary commercial and recreational species.
- Develop innovative stock assessment models for sharks to address data limitations.

Low Priorities

- For each species, identify the appropriate age classes on which to focus fishing mortality reductions. Identify important habitat/areas for these age classes.
- Develop year-round abundance/distribution estimates of sharks in current closed areas or key habitats (e.g., mid-Atlantic shark closure, Charleston Bump); consider how and when sharks use certain key habitat areas.
- Determine if the Carolina hammerhead is a distinct species and requires management.
- Develop in-field, rapid genetic identification techniques to aid enforcement in distinguishing among species.
- Explore the validity of age and growth studies that use tetracycline versus bomb carbon or other techniques.