



**Gulf of Maine Responsibly Harvested Report:  
Gulf of Maine/Georges Bank White Hake**

- The fishery is managed by a competent authority and has a management plan in place that incorporates a science-based approach to ensure sustainability.
  - *White hake is managed by National Marine Fisheries Service (NMFS) and New England Fisheries Management Council (NEFMC), and regulated by the Northeast Multispecies Fishery Management Plan. The 2013 stock assessment utilized a catch-at-age model (ASAP) incorporating the best science into stock modeling to set biological reference points and harvest restrictions.*
  
- If stock sizes are below management target levels, whether due to natural or man-made causes, management plans are established that enable rebuilding within a specified timeframe.
  - *Based on the most recent assessment, white hake is not overfished and overfishing is not occurring. Management measures have helped the stock rebuild to 83% of the revised  $SSB_{MSY}$ . The selected fishing mortality  $F=0.13$  is below  $F_{MSY}$ . Projection models show  $SSB$  surpassing  $SSB_{MSY}$ , indicating stock recovery, in 2015.*
  
- Sufficient data exists to determine harvest levels.
  - *The Northeast Regional Stock Assessment Review Committee (SARC 56) examined fisheries-dependent and –independent data for white hake. The 2013 assessment considers a wide range of data up to 2012, including state and federal surveys and commercial landings reports. These include NEFSC surveys, vessel trip reports, dealer landings records, and on-board fishery observer data. It is not considered a data poor species. The Council sets the annual catch limits (ACL) based on these data.*
  
- Monitoring and compliance measures are in place to ensure acceptable harvest levels.
  - *White hake catch is monitored through vessel trip reports (VTRs), observers, dealer reports, and, for sectors, additional at-sea monitoring. Compliance is assessed through consistency throughout these reports as well as enforcement in the field.*
  
- Enforcement exists to ensure that harvesters follow regulations, and to prevent illegal practices and unreported harvest.
  - *U.S. Coast Guard, NMFS Office of Law Enforcement agents, and state marine patrol agents enforce the laws and regulations governing white hake harvest.*

## Definition of White Hake

White hake (*Urophycis tenuis*) is a demersal gadid fish species distributed from Newfoundland to North Carolina and is most abundant in the Gulf of Maine. Based on genetics studies, there is evidence of mixing among stock units in Canadian waters, but no such research has provided this information in US waters. White hake is managed as a single stock in US waters (Figure 1). While the white hake stock unit extends into southern New England waters, this report focuses on the management and harvesting of white hake in the area outlined by Gulf of Maine Responsibly Harvested Standard<sup>1</sup>. The primary gear type used to catch white hake is the otter trawl, followed by sink gill nets accounting for about 25% of total landings, and line trawl less than 1% (NEFSC 2008).

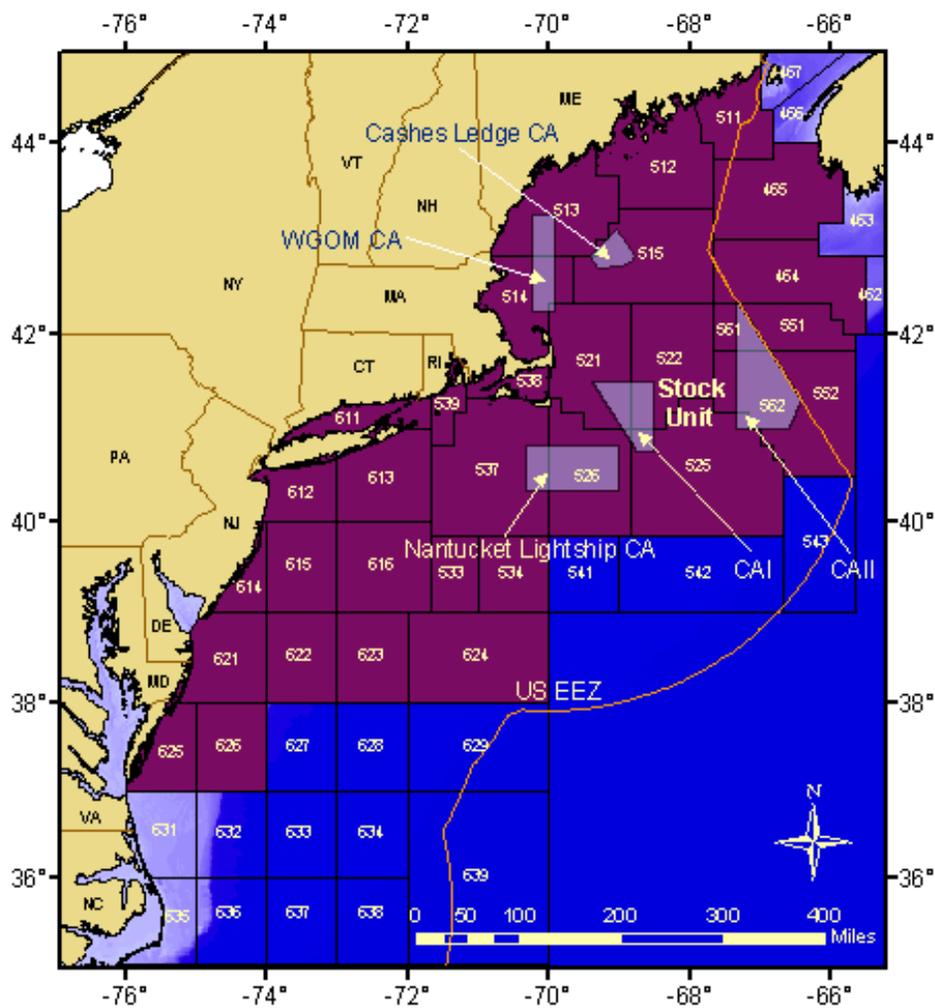


Figure 1. Statistical areas included in the white hake stock unit are shown in pink. Unnumbered areas are closed to groundfishing. The orange line represents the U.S. Exclusive Economic Zone (NEFSC 2008).

<sup>1</sup> This excludes white hake harvested in statistical area 536 and all other areas south or directly west of 525.

## I. Description of the Management Authority and Regulatory Process

Responsibility of white hake management lies within the [National Marine Fisheries Service \(NMFS\)](#), which is a part of the [National Oceanic and Atmospheric Administration \(NOAA\)](#). The [New England Fishery Management Council \(NEFMC\)](#) facilitates the development of white hake regulations as part of a complex of 16 species that are managed together as the Northeast Multispecies Fishery. The NEFMC consists of 18 voting members, including the Regional Administrator for NMFS, the principal marine resource management official from each New England state, and governor appointees.

For Northeast multispecies fisheries management, a sub-set of NEFMC members form an Oversight Committee. This committee is responsible for the development of the fishery management plan and regulations that are consistent with the ten national standards outlined in the Magnuson Stevens Act (MSA), which dictate that conservation and management measures shall:

1. Prevent overfishing while achieving optimum yield.
2. Be based upon the best scientific information available.
3. Manage individual stocks as a unit throughout their range, to the extent practicable; interrelated stocks shall be managed as a unit or in close coordination.
4. Not discriminate between residents of different states; any allocation of privileges must be fair and equitable.
5. Where practicable, promote efficiency, except that no such measure shall have economic allocation as its sole purpose.
6. Take into account and allow for variations among and contingencies in fisheries, fishery resources, and catches.
7. Minimize costs and avoid duplications, where practicable.
8. Take into account the importance of fishery resources to fishing communities to provide for the sustained participation of, and minimize adverse impacts to, such communities (consistent with conservation requirements).
9. Minimize bycatch or mortality from bycatch.
10. Promote safety of human life at sea.

To help the Oversight Committee meet these requirements, an Advisory Panel made up of representatives from the fishing industry, scientists, and conservation organizations provides input to management measures. The chairs of the Oversight Committee provide detailed guidance (terms of reference) to a Plan Development Team (PDT), which consists of scientists, managers and other experts on biology and/or management of white hake. Then the PDT provides reports to the Oversight Committee in response to the terms of reference. The PDT meets regularly to provide analysis of species-related information and to develop issue papers, alternatives, and other documents as appropriate. The NEFMC is also assisted by the members of the Scientific and Statistical Committee (SSC), who review and participate in stock assessment updates, and develop acceptable biological catch (ABC) recommendations that inform management decisions. Figure 2 provides a visual of the entire process.

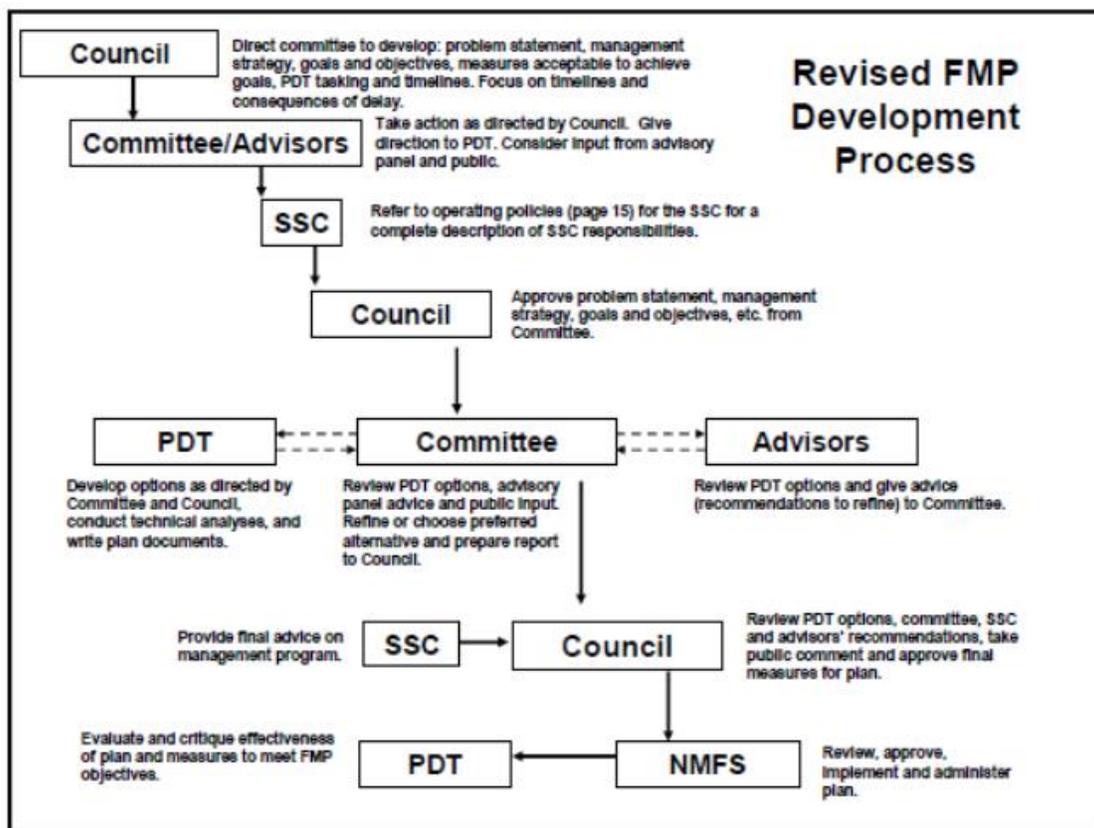


Figure 2. Fishery Management Plan Process (Fiorelli 2008)

## II. Data Analysis and Stock Status

**Data:** The 2013 56th Northeast Regional Stock Assessment Review Committee (SARC-56) and Stock Assessment Workshop (SAW-56) utilized a wide range of data including state and federal surveys and commercial landings per unit effort (LPUE). More specifically, the 2013 assessment model incorporated data from spring and autumn bottom trawl Northeast Fisheries Science Center (NEFSC) surveys, Maine-New Hampshire Inshore Groundfish Trawl Surveys, vessel trip reports, dealer landings records, and on-board fishery observers (NEFSC 2013). The accepted model, the Age Structured Assessment Program model (ASAP), used in the 2013 assessment includes catch, survey, and biological data from 1963 through 2012. The SAW 56 assessment also used certain data analyses that differed from the previous Groundfish Assessment Review Meeting Statistical Catch at Age (GARM III SCAA) assessment, thus revising biological reference points (BRPs) utilizing the most up to date understanding of the fishery data.

**Modeling:** Landings and survey data are used in determining the biological reference points (BRPs) for white hake. The latest assessment, in February 2013, utilized the accepted statistical catch-at-age model (ASAP) that included actual commercial landings, estimates for recreational landings, commercial

discards, research survey abundance indices, and analytical models. This SARC-56 model assumes asymptomatic selectivity at age for the catch at age 6, which is more consistent with catch data than the domed F pattern used in the previous assessment. The new assessment also makes use of revised catch streams, pooled (as opposed to annual) age-length keys (ALKs), and a revised fishing selectivity estimate. A source of uncertainty noted in the assessment is that catch-at-age information is not precisely characterized due to possible misidentification of species in commercial and at-sea sampling data, particularly in early years that include sparse discard data, or in years of low commercial landings. In addition, age-length keys are missing for certain years. As a result, a pooled age-length key from 1982-2004 was used to fill in gaps in age composition, which can blur recruitment estimates. The BRPs from the previous assessment in 2008, the Groundfish Assessment Review Meeting (GARM III) report, have been recalculated using the updated ASAP results.

**State of the Stock:** The resulting BRP estimates are a Spawning Stock Biomass (SSB) at maximum sustainable yield ( $SSB_{MSY}$ ) of 32,400 mt, a fishing mortality ( $F_{MSY}$  proxy (F40%) of 0.20, a mean recruitment of 5.5 million, and a Maximum Sustainable Yield (MSY) of 5,639 mt (NEFSC 2013). The spawning stock biomass in 2011 is estimated at 26,877 mt, which is 83% of the revised  $SSB_{MSY}$  (Figure 3). Stock assessment estimates indicate that stock size has been consistently below the management target of  $SSB_{MSY}$  since 1980, although it is nearing the target threshold for  $SSB_{MSY}$  (Figure 3). The fishing mortality  $F$  is estimated at 0.13, which is below the revised  $F_{MSY}$  proxy, only representing 66% (Figure 4). As biomass ( $B$ ) levels are greater than half the  $B_{MSY}$ , and  $F$  is less than  $F_{MSY}$ , Gulf of Maine-Georges Bank white hake is not overfished and overfishing is not occurring in accordance with the NOAA definitions (NEFSC 2013). The current management plan in place is allowing the stock to rebuild, and annual commercial landings have remained below annual catch limits (ACLs) since the transition to the quota-based sector management system in 2010 (Figure 5) (NOAA, 2014).

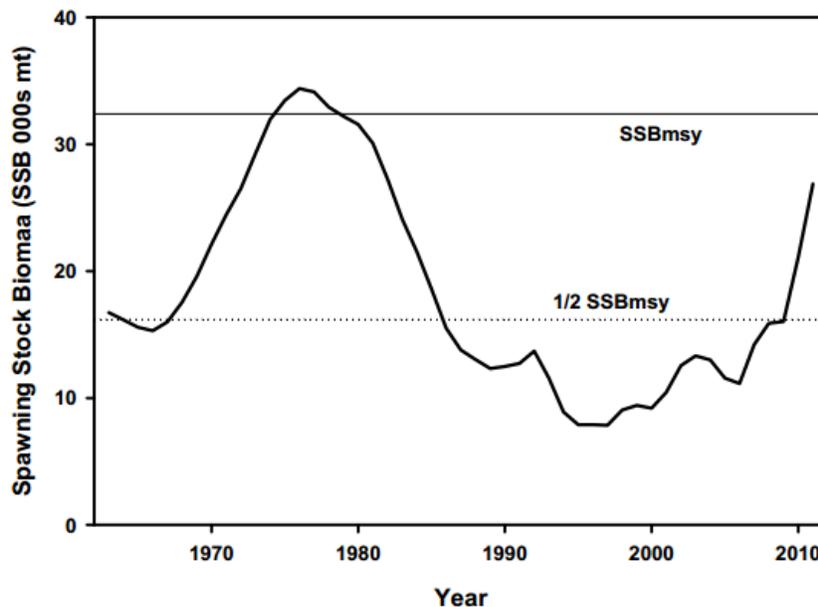


Figure 3. Trend in spawning stock biomass of Gulf of Maine white hake (NEFSC 2013).

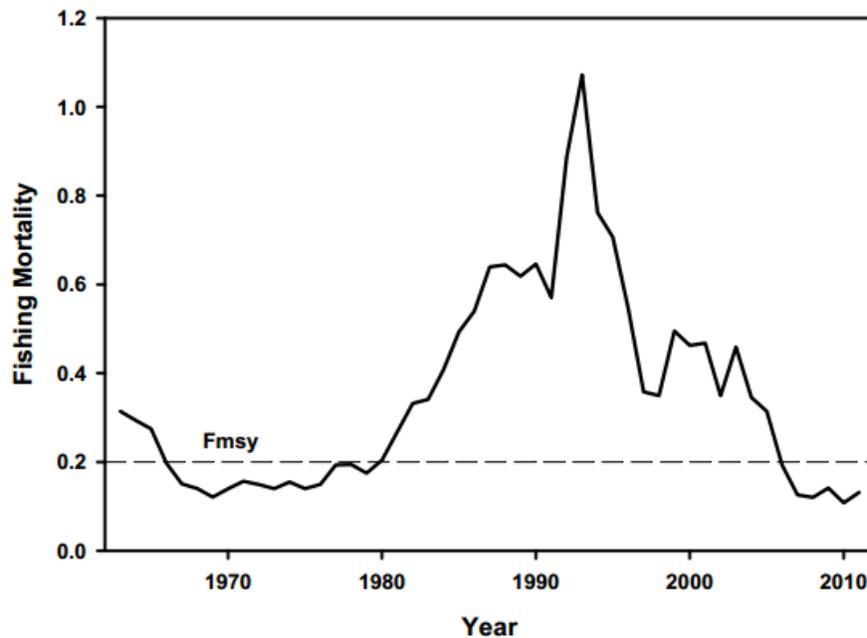


Figure 4. Trend in selected fishing mortality of Gulf of Maine white hake; (graph contains two selectivity blocks, meaning  $F$  is not strictly comparable before 1998 and after 1997). (NEFSC 2013)

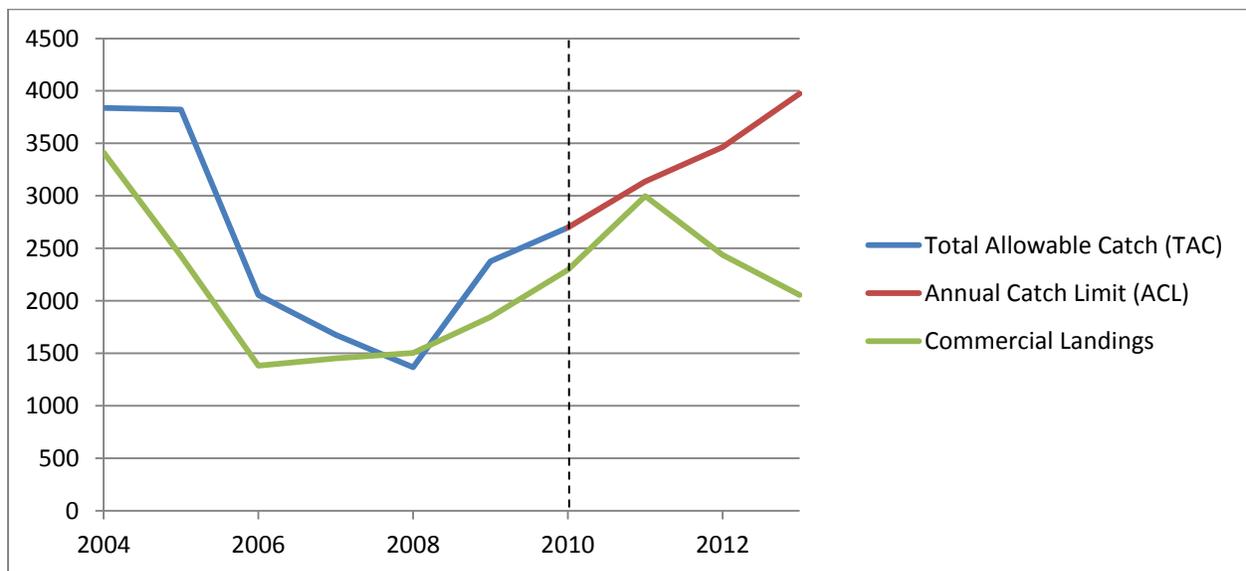
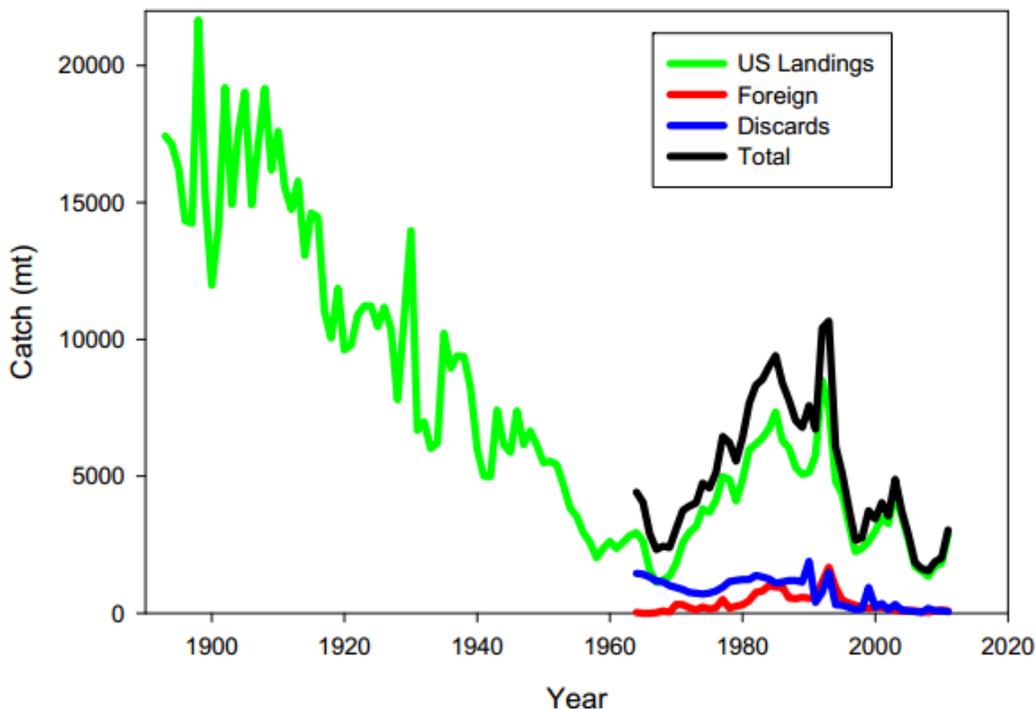


Figure 5. Trend in catch targets and ACLs vs. landings from 2004-2013 (NOAA 2014). The dashed line represents when the current sector management system (using Annual Catch Limits) was implemented in 2010. Prior to 2010, the groundfish fishery was primarily regulated by effort control (i.e. days at sea, trip limits) and there were catch targets, referred to as Total Allowable Catch, used by the management system in determining regulations.

Catch history: Historic landings of white hake reached as high as 22,000 mt, reported in 1898. Since the modern fishery was established in 1964, U.S. landings have varied from a low of 1,147 mt in 1967 to over 9,500 mt in 1992, and have fluctuated between 2000 mt and 3000 mt in recent years (*Figure 6*). Discards have been gradually decreasing since 1999, reaching an all-time low of 54.4 mt in 2011 (NEFSC 2013). The decrease in fishing effort and discards is representative of management changes within the white hake fishery to support stock sustainability. Recruitment has been shown to be stable as long as catches do not significantly fluctuate, which will help ensure the future of the stock (NEFMC 2013).



*Figure 6. Trend in landings and discards of Gulf of Maine white hake (NEFSC 2013).*

Sufficient data exists to determine acceptable harvest levels for current and coming fishing years. The annual catch limits (ACL) for this stock in fishing years (FY) 2014-16 are identified in Framework Adjustment 51, which incorporates findings from the most recent stock assessment (SAW-56) (NMFS, 2014)<sup>2</sup>. Based on recommendations by the Science and Statistical Committee (SSC), the NEFMC set Overfishing Levels (OFL) and Acceptable Biological Catches (ABC), which are set to inhibit overfishing. The approved OFLs, ABCs, and ACLs for FYs 2014-2016 under Framework Adjustment 51 are outlined in the table below (*Table 1*) (NMFS, 2014).

<sup>2</sup> A Framework Adjustment is an abbreviated rule-making process for actions within the scope of the existing goals and objectives of the respective fishery management plan (Amendment 16 in this case), and with no significant impacts on the human or physical environment.

Table 1.

Fishing Year	Overfishing Limit (OFL)	Acceptable Biological Catch (ABC)	Total Annual Catch Limit (ACL)	Sector ACL	Common Pool ACL
2014	6082 mt	4642 mt	4417 mt	4247 mt	30 mt
2015	6237 mt	4713 mt	4417 mt	4247 mt	30 mt
2016	6314 mt	4645 mt	4420 mt	4250 mt	30 mt

Projections: The stock assessment and projections indicate that biomass in the fishery is increasing. Catch trends also appear to be declining since the terminal year of landings data, 2011, used in the SARC-56 assessment model. This is possibly due to fishing constraints by other stocks, primarily yellowtail flounder (NEFMC 2013). Two projection scenarios were generated using time series recruitment, fishing mortality, and biomass indicators based on periods of low recruitment and higher recruitment from recent data (1963-2009). The higher recruitment scenario, based on average recruitment over this time period, estimates that SSB will increase to 34,473 mt in 2015 and 35,371 mt in 2016, with catches also increasing during these years. The lower recruitment scenario, based explicitly on more recent data from 1995-2009, projects that SSB will reach a similar level in 2015 and decline slightly in 2016. Regardless of the scenario, projections indicate that SSB will remain and continue to increase above 50%  $SSB_{MSY}$ , and that fishing effort will remain below  $F_{MSY}$  (NEFSC 2013).

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### III. Northeast Multispecies Fisheries Management Plan

The Northeast Multispecies Fishery Management Plan (FMP) was implemented in 1986 to reduce fishing mortality of heavily fished groundfish stocks and to promote rebuilding to sustainable biomass levels. Sixteen species are managed under Amendment 16 to Northeast Multispecies FMP. Thirteen large-mesh species are managed together based on fish size and type of gear used to harvest the fish: Atlantic cod, haddock, pollock, yellowtail flounder, witch flounder, winter flounder, windowpane flounder, American plaice, Atlantic halibut, redfish, ocean pout, white hake, and wolffish. Because several large-mesh species are managed as two or more separate stocks (e.g., Gulf of Maine haddock and Georges Bank haddock), there are a total of 20 separate stocks of groundfish managed under the FMP. The other three species (silver hake [or whiting], red hake, and offshore hake) are managed under a separate small-mesh multispecies program pursuant to Amendment 12 of the Northeast Multispecies FMP.

The Groundfish Complex: Groundfish have been managed by seasonal and year-round area closures (i.e., no fishing in certain areas), gear restrictions (i.e., specified mesh size, number of nets/hooks, etc.), minimum fish size limits, trip limits (i.e., limiting fishermen to a certain poundage of fish per trip), limited access (i.e., limiting the number of participants in the fishery), and restrictions on the number of days a

vessel is allowed to fish for groundfish each year (i.e., days-at-sea) (NEFMC 2009). In May 2004, Amendment 13 to the FMP implemented formal rebuilding plans for groundfish stocks, including Gulf of Maine white hake, based on revised biomass and fishing mortality targets derived by the Working Group on Re-evaluation of Biological Reference Points for New England Groundfish. The overall goal of these actions was to reduce fishing mortality to rebuild depleted groundfish stocks to target biomass levels.

In addition to general regulations for the fishery, Amendment 16 also implements species- and stock-specific regulations for vessels in the common pool and in sectors. Beginning in 2010, commercial harvesters of Gulf of Maine white hake became managed in two self-selecting categories: Common Pool and Sectors.

The current regulations setting the catch levels for each of the 20 groundfish stocks, which were implemented by Framework Adjustment (FW) 48 to Amendment 16 in 2013, and revised in FW 50 in 2013, implement new requirements under the Magnuson-Stevens Reauthorization Act (MSRA) of 2006. The MSRA requires the NEFMC to determine Annual Catch Limits (ACLs) and Accountability Measures (AMs) for all managed stocks. This action implements a process for calculating an ACL in addition to the Overfishing Level (OFL) and Acceptable Biological Catch (ABC) for each stock. Recommendations for these figures are developed by the PDT. The Science and Statistical Committee (SSC) recommends ABC levels, and the NEFMC approves final ACLs, but cannot exceed the SSC's recommended levels. ACLs may be broken into subcomponents for different segments of the fishery, including state waters, commercial, recreational, sectors, and the common pool. Although the following stocks have ACLs, possession is prohibited: windowpane flounder, ocean pout, and wolffish. In addition, halibut catch is limited to one fish per trip. Northeast Multispecies permit holders are eligible to receive an allocation for the remaining groundfish stocks.

Common Pool: Members in the common pool are managed by an effort control system that regulates the number of days a harvester may fish. In addition to a limited number of days a harvester may fish, controls include 24-hour days-at-sea (DAS) counting, trip limits on other groundfish stocks, gear restrictions, minimum mesh size restrictions, gillnet restrictions, hook limits, seasonal and year-round closures, minimum fish size restrictions, and special access programs. Specific effort control measures are described in the final rule for Amendment 16 (NMFS 2013). For example, NOAA's Northeast Regional Office implemented a 2000-lb trip limit for GOM white hake beginning in FY 2012 for common pool vessels (NMFS 2013).

Sectors: Sectors are self-selecting and largely self-regulating groups of fishermen who collaboratively manage an allocation of fish. Sectors must draft and submit formation proposals, operations plans, and sector monitoring plans, revised enforcement provisions, and clarification of the interaction of sectors with Special Management Programs, such as U.S./Canada management areas. NMFS prepares an environmental assessment (EA) annually to assess the impacts of the individual and cumulative sector operations as proposed in their operations plans.

In exchange for fishing under an ACL for each allocated species in the management plan, sectors are exempt from most common pool effort control measures, such as limited number of days at sea and trip

limits. These are referred to as universal exemptions. A sector's allocation of an ACL for a particular stock is called the Annual Catch Entitlement, or ACE, and is a sub-ACL of the overall fishery ACL. At-sea catch monitoring ensures that sector ACEs are not exceeded. For each permit that is eligible to join a sector, the permit's potential sector contribution (PSC) is calculated based on the permit's catch history. The ACE that is allocated to a sector is based on the sum of the PSCs for the permits that join the sector. Sector participants are not allowed to discard legal sized fish, and all fish caught count toward their sector allocations.

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#### **IV. Monitoring**

The monitoring programs in place for the Northeast multispecies fishery provide information to scientists and managers about when, where, and how fish are caught. In addition to information about fish that are landed, the monitoring programs can provide information about species that are not landed. For example, in support of the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA), observers record interactions with protected and endangered species.

Monitoring of the common pool is carried out through several different programs. When fishing in certain areas, such as the Eastern U.S./Canada Area, vessels are required to submit daily vessel trip reports (VTRs), which provide details on type of gear fished, area fished, species caught and discarded, dealer information, and port of landing information, in addition to other details. The Northeast Fisheries Observer Program (NEFOP) employs at-sea observer coverage and biological sampling for the groundfish fleet. Separate from NEFOP, there are also shore-side port samplers who take biological samples from landed catch to help inform stock assessments and other fisheries research.

The final rule for Standardized Bycatch Reporting Methodology (SBRM) states that the Regional Administrator and the Science and Research Director will allocate at-sea observer coverage to the applicable fisheries of the Northeast Region sufficient to achieve a level of precision (measured as the coefficient of variation [CV]) no greater than 30% for each fishery (73 FR 4736; January 28, 2008). Eight percent of all common pool trips to fish for white hake need at-sea observers on board as required by NEFOP regulations. The Pre-Trip Notification System (PTNS) ensures fair and adequate coverage of vessels across the multispecies fishery. Vessels enter information into PTNS prior to a trip, and an algorithm randomly selects trips for coverage in order to achieve the targeted observer and at-sea monitor coverage across sectors, areas, and gear types.

Sectors have additional monitoring requirements. Sector operations plans specify how a sector will monitor its catch to assure that sector catch does not exceed the sector allocation. Industry funding of at-sea monitoring (ASM), which was to begin after FY 2010, has been deferred each year since, most recently through FY 2014. Sector required at-sea coverage is typically between 17% and 22%. This monitoring is in addition to the 8% NEFOP coverage, establishing total at-sea observer coverage

between 25% and 30%, though it has been higher and lower depending on federal funding. All sector vessels are still required to submit weekly VTRs in accordance with NOAA Multispecies Amendment 16.

Shore-side, there is 100% electronic dealer reporting on a weekly basis, which includes, but is not limited to, unique trip identifier, quantity of species landed, price per unit by species, and port and state landed.

Based on the data collected through monitoring, the Northeast multispecies complex is routinely evaluated and necessary changes to management measures are made through biennial Framework Adjustments.

## **V. Enforcement**

In general, enforcement of the NE Multispecies FMP is coordinated through NOAA's Office of Law Enforcement (OLE). OLE Special Agents and Enforcement conduct complex criminal and civil investigations, board vessels fishing at sea, inspect fish processing plants, and conduct patrols on land, in the air and at sea. In addition to this enforcement work, the OLE administers the Cooperative Enforcement Program (CEP), which authorizes certain coastal state and territorial marine conservation law enforcement agencies to enforce federal laws and regulations in the Exclusive Economic Zone (EEZ). OLE also partners with the U.S. Coast Guard (USCG) and various other federal agencies, fishery management councils, and non-governmental organizations. In the common pool, enforcement is focused on compliance with days-at-sea (DAS), seasonal closures, closed areas, gear restrictions, and trip limits, to name a few measures. Enforcement for sector vessels will primarily rely on monitoring harvest levels through sector reporting and VTRs (in addition to some of the measures described above for which sectors are not universally exempt); however individual sectors are also responsible for self-enforcement. Dealer reporting is a requirement of dealers who receive the fish.

It is the responsibility of each sector to enforce any provisions adopted through procedures established in the operations plan and agreed to through the sector contract. Sectors may be held jointly liable for violations of the following sector operations plan requirements: ACE overages, discarding of legal-sized fish, and misreporting of catch (landings or discards).

NOAA's Office of General Counsel reports on any enforcement actions taken, by region, on a semi-annual basis, and also outlines regional enforcement priorities on an annual basis. Data available on enforcement actions between March 2010 - December 2013 shows that in the Northeast, there were no specific violations involving white hake. Of the general enforcement actions reported that could have pertained to fishermen in the Northeast Multispecies fishery (although not specified in these more general violations), the most predominant problems were related to fishing in closed areas, reporting violations, gear violations, and possession or overage violations. In each category, there were less than 15 violations between March 2010 – December 2013.

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