

**Gulf of Maine Research Institute
Responsibly Harvested Seafood from the Gulf of Maine Region**

**Report on
Whiting (Silver hake), US Northern and Southern Stocks**

- ☒ The fishery is managed by a competent authority and has a management plan in place that incorporates a science-based approach to ensure sustainability.
 - *Whiting is managed by NMFS and NEFMC, and regulated by under Amendment 12 of the Northeast Multispecies Fishery Management Plan, which utilizes the best available science 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.
 - *According to the biological reference points and analysis of the 2010 51st Northeast Regional Stock Assessment Workshop (SAW 51), the northern and southern stocks are not overfished ($B > \frac{1}{2} B_{MSY}$). In addition, the assessment also determined that overfishing is not occurring in either stock ($F < F_{MSY}$), based on data from the 2009 fishing year.*

- ☒ Sufficient data exists to determine harvest levels.
 - *SAW 51 established up-to-date biological reference points based on the available data. Ultimately, the Council and/or the Regional Administrator set the harvest levels (Annual Catch Limits or ACLs), based recommendations of the Science and Statistic Committee and Plan Development Team. ACLs are being finalized and will be in place for the 2012 fishing year.*

- ☒ Monitoring and compliance measures are in place to ensure acceptable harvest levels.
 - *Whiting possession limits and harvests are monitored through observers, dealer reports, dockside monitoring and other electronic reporting requirements. 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 the harvest of whiting.*

I. Definition of Whiting

Silver hake (*Merluccius bilinearis*), also known commonly as whiting, is harvested from waters throughout New England and range from Newfoundland to South Carolina. Whiting prey on other fish, squid, and crustaceans, and play an important role in the food web as prey for important commercial species such as red and white hake, cod, haddock, and pollock (Lock and Packer 2004). Two separate stocks of whiting have been identified based on size variations, resulting in the northern and southern stocks being managed separately to account for these biological variances (Fig. 1). While there is a degree of mixing between the two stocks on Georges Bank, the extent of mixing is unknown (NFSC 2011). The total distribution of the northern stock is included in the Gulf of Maine Responsibly Harvested program's harvest area, while the northern most range of the Southern Stock, Area 562, is also included harvest area. As a result, this report will include information pertaining to both stocks.

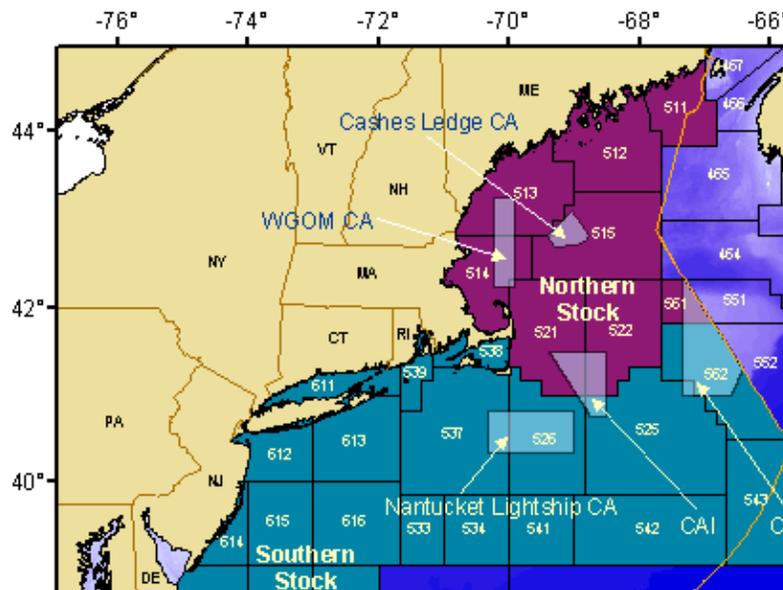


Figure 1. Statistical areas and distribution of northern and southern whiting stocks in New England (NESFC 2006).

II. Description of the Management Authority and Regulatory Process

Responsibility of whiting 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 whiting regulations under Amendment 12 of the Northeast Multispecies Fishery Management Plan (FMP). Red hake and offshore hake are also managed under Amendment 12, or the small mesh multispecies program, while the remaining 15 northeast groundfish species are separately managed under Amendment 16 of the FMP. 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 whiting management, the NEFMC is advised by the Small Mesh Multispecies Oversight Committee. The Committee consists of representatives from state and federal management agencies, the fishing industry, environmental groups, as well as one representative from the Mid-

Atlantic Fishery Management Council. 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, a Whiting 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 whiting. 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. Figure 2 provides a visual of this process.

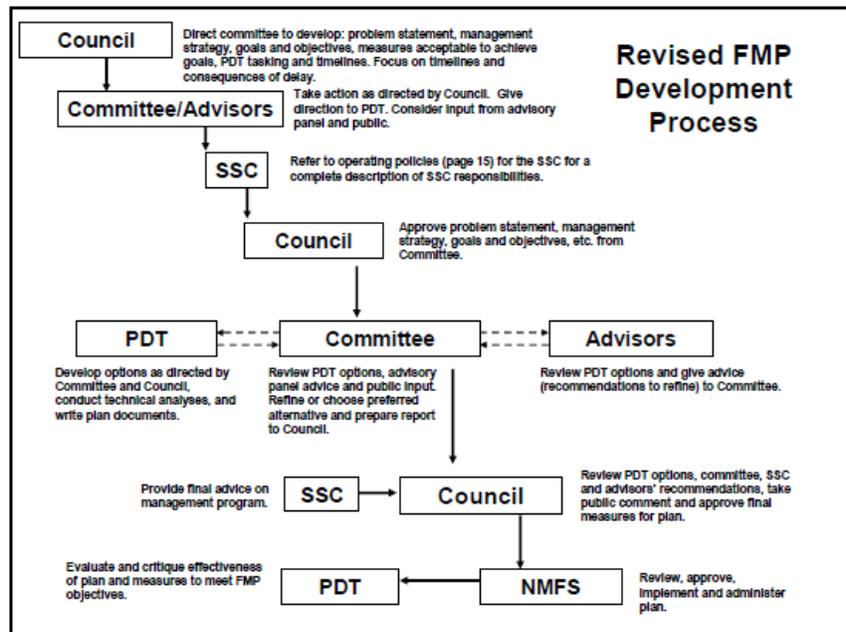


Figure 2. Fishery Management Plan Process (Fiorelli 2008)

III. Whiting Data

Stock Status and Biological Reference Points

Landings data and Northeast Fishery Science Center (NFSC) survey data are used in determining the biological reference points (BRP) for both the northern and southern whiting management areas. Under the small mesh multispecies program, overfishing of northern hake is defined using a relative exploitation index, or the total landings divided the NFSC autumn survey biomass index (NEFMC 2000). Overfishing of the northern stock occurs when this exploitation index is greater than the proxy of $F_{MSY}=2.57$, or the average exploitation index during 1973-1982. The northern stock is considered overfished when the 3 year average biomass is less than $\frac{1}{2}$ the B_{MSY} proxy, where $\frac{1}{2}B_{MSY}=3.32$ kg/tow, or the average observed from 1972-1973.

According to the 51st Stock Assessment Workshop (SAW 51) conducted in 2010, utilizing data “based on trends in the three year moving averages for the age-aggregated, fall survey biomass indices from 1973-1982...and the three year averages of exploitation indices (total catch/fall survey biomass index)” (NSFC 2011), overfishing was not occurring in the northern or southern whiting stocks, and neither stock was considered overfished. The 2007-2009 northern stock survey data average was 6.79 kg/tow, which is above the overfished biomass threshold of $\frac{1}{2}B_{MSY}$ proxy=3.31 kg/tow. The 2007-2009 exploitation index of 0.15 was well below the overfishing threshold (proxy for $F_{MSY}=2.57$) and thus overfishing is not occurring. The 2007-2009 survey data from the southern stock (1.39 kg/tow) was above the overfished threshold of $\frac{1}{2}B_{MSY}$ proxy=0.89 kg/tow, while the assessment determined that overfishing was not occurring in the southern stock, as the current exploitation index (4.33) was below the overfishing threshold of F_{MSY} proxy=34.39 (NFSC 2011).

In addition, determining stock status using the existing BRPs found in the small mesh multispecies FMP, a term of reference in SAW 51 called for updated and refined BRPs based on additional data, modeling, or uncertainties. These new BRPs, which have not been finalized to the FMP, along with the existing BRPs for the northern and southern stocks, can be found in Table 1.

Table 1. Current biomass, exploitation indices and biological reference points for northern and southern whiting stocks (NFSC 2011).						
	Current Biomass Index	Existing FMP Biomass Threshold= $\frac{1}{2}B_{MSY}$ proxy (Overfished)	New SAW 51 Biomass Threshold= $\frac{1}{2}B_{MSY}$ proxy (Overfished)	Current Exploitation Index	Existing FMP Exploitation Threshold= F_{MSY} proxy (Overfishing)	New SAW 51 Exploitation Threshold= F_{MSY} proxy (Overfishing)
Northern Stock	6.49 kg/tow	3.31 kg/tow	3.21 kg/tow	0.15	2.57	2.78
Southern Stock	1.39 kg/tow	0.89 kg/tow	0.83 kg/tow	4.33	34.39	34.19

Historical Landings Data

Historically, the northern whiting stock has been a commercially important fishery for Maine and Massachusetts, with the stock becoming of economic importance to Rhode Island in the 1990s. The southern stock is typically targeted by vessels from southern New England and the Mid-Atlantic states. Total landings for whiting peaked in 1964 at 94,000mt and have declined steadily since 1975 (NFSC 2011). In 2009, commercial landings from the southern stock were 6720 mt, while 1,038 mt from the northern stock were landed (Fig. 3). Current landings from both stocks are considered at historic lows.

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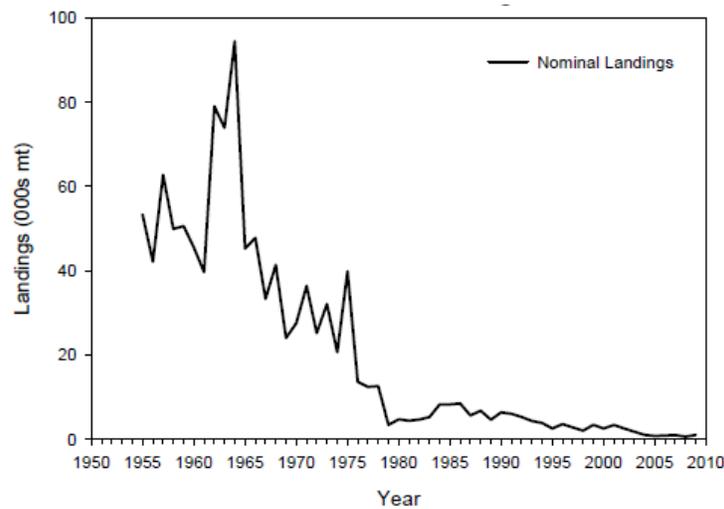


Figure 3. Historical landings of northern whiting stock (NESFC 2010).

According to NFMS survey data, biomass of the northern stock has remained above the overfished threshold since 1971, and the southern stock biomass has recovered from when it was considered overfished in 2005 (NFSC 2006).

Sources of Uncertainty

SAW 51 identifies the following sources of uncertainty for northern and southern whiting stocks (NFSC 2011):

1. The mis-reporting of whiting and offshore hake, resulting in some uncertainty in landings¹.
2. Survey data shows that there is some north-south movement among adult whiting on Georges Banks and as a result there is an unknown extent of mixing between the northern and southern stock.
3. The abundance of larger and older whiting is decreasing, despite a relatively high biomass and low fishing mortality. The reason for this reduction is unknown.

IV. Amendment 12 to the 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. Three species (whiting, red hake, and offshore hake) are managed under the small mesh multispecies program pursuant to Amendment 12 of the Northeast Multispecies FMP, while 16 other groundfish species are managed separately, under Amendment 16 to the FMP.

Amendment 12, sometimes referred to as the small mesh multispecies FMP, was passed in 2000, to eliminate the overfishing of the small mesh multispecies and to rebuild these stocks within a ten-year period as required under the Sustainable Fisheries Act.

¹ One current proposal that is being assessed by the NEFMC would incorporate offshore hake into the ACL of the southern whiting stock. Despite being separate species, the proposal would set aside 4% of the southern stock ACL for offshore hake as a result of mixing between the species.

Amendment 12 implemented management measures such as, seasonal closures (i.e., no fishing in certain areas), gear restrictions (i.e., specified mesh size), 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). Amendment 12 also established BRPs to define overfished and overfishing of the northern and southern whiting stocks. The overall goal of these actions was to reduce fishing mortality to rebuild whiting stocks to target biomasses. If these management measures were unsuccessful, then default measures were to be implemented during Year 4 of the rebuilding timeframe (NEFMC 2000).

The management plan enacted under Amendment 12 had a positive outcome for the whiting fishery. As a result, Framework 37 was finalized by NMFS in 2003. Framework 37 sought to eliminate the Year 4 default measures and expand fishing opportunities for the northern whiting stock, as the recent stock assessment showed the stocks could support increased fishing effort without becoming overfished (NEFMC 2003a). At the time, the northern stock was rebuilt to 176% of its target biomass, while the southern stock was no longer considered overfished. Along with eliminating default measures, Framework 37 also extended the fishing season for the offshore Cultivator Shoal whiting fishery.

Additional management efforts were finalized in 2003 under Framework 38 to the FMP. Framework 38 allowed grate raised footrope trawl gear to be exempt from the Gulf of Maine Regulated Mesh Area. This type of trawl gear had been part of an experimental fishery for the previous eight years, and data collected showed successful and compelling results in reducing bycatch of other regulated species (NEFMC 2003b). Under Framework 38, the grate raised footrope trawl gear season extends from July 1st to November 30th and requires other gear specifications, such as 2.5 inch cod end mesh and use of Nordmore grates (NEFMC 2003b). A possession limit for 7,500lbs for whiting was also implemented.

Currently, NEFMC is defining Annual Catch Limits (ACLs) for the northern and southern whiting stocks as required under MSA. Determination of ACLs and Allowable Biological Catch (ABC) is based on analytical assessment from the Council's Science and Statistical Committee, Whiting PDT, and data from the SAW 51. While overfishing is not occurring in either stock and neither stock is overfished, there was some uncertainty in the age structure data utilized, resulting in a delay in determining the appropriate assessment model (Howard 2011). The Whiting PDT is considering options based on the available data in SAW 51 and will provide NEFMC with the potential ACLs in a draft Amendment 19 in September 2011. Final approval of the ACLs will allow NEFMC to achieve the MSA-mandated 2011 deadline that requires ACLs for all commercial fish stocks (NEFMC 2011).

V. Monitoring

When fishing in certain areas, vessels are required to submit 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 New England Fisheries Observer Program (NEFOP) employs at-sea observer coverage and port sampling for the groundfish fleet. 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 (NOAA 2008). In addition, vessels fishing in Special Access Programs (SAPs) are required to contact NEFOP prior to their trip to determine if they will have observer coverage. There are also shore-side port samplers who periodically work at fish auctions and exchanges taking biological samples. This program ensures compliance with the MSA in addition to the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). 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.

VI. 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. Enforcement of the whiting fishery is focused on compliance with DAS, seasonal closures, closed areas, gear restrictions, and trip limits, to name a few measures.

V. References

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