CONSERVATION LAW FOUNDATION
NATIONAL AUDUBON SOCIETY * NATURAL RESOURCES DEFENSE COUNCIL
THE PEW CHARITABLE TRUSTS * WILD OCEANS

October 21, 2019

Michael Pentony, Regional Administrator
National Marine Fisheries Service
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Gloucester, MA 01930
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Submitted via Federal eRulemaking Portal

Re: Comments on Herring Amendment 8 (NOAA-NMFS-2019-0078)

Dear Mr. Pentony:

We are writing on behalf of Conservation Law Foundation ("CLF"), National Audubon Society, Natural Resources Defense Council, The Pew Charitable Trusts, Wild Oceans, and members to provide public comment on Amendment 8 to the Atlantic Herring Fishery Management Plan ("Amendment 8"), its Final Environmental Impact Statement ("FEIS"),[1] and the proposed implementing regulations.[2] Our organizations strongly support Amendment 8 and urge the National Marine Fisheries Service ("NMFS") to implement the proposed measures including: (1) Alternative 4b Revised: an acceptable biological catch ("ABC") control rule that explicitly accounts for herring's role in the ecosystem and leaves an additional 20-percent of the biomass in the water for predators; and (2) Alternative 10: a year-round midwater trawl prohibition that extends 12-20 nautical miles from shore between the U.S./Canada border and the Rhode Island/Connecticut border to prevent localized depletion and user group conflicts.[3]

I. NMFS SHOULD APPROVE AND IMPLEMENT AN ABC CONTROL RULE WITH EXPLICIT ECOSYSTEM CONSIDERATIONS

The primary purpose of Amendment 8[4] is to develop a long-term ABC control rule for the Atlantic herring fishery that explicitly accounts for herring's role in the ecosystem and in addition "[t]o provide guidance to the SSC regarding how to specify an annual ABC to account for scientific uncertainty, stock status, and the Council's risk tolerance to maintain a sustainable Atlantic herring stock that includes consideration of herring as a forage species."[5] Consistent with the Magnuson-Stevens Act, its National Standards, and the National Standard 1 guidelines, the control rule must be based upon the best available science for setting catch limits for forage fish. Alternative 4b Revised is such a forage based control rule that achieves the purpose and

[1] Notice of Availability, 84 Fed. Reg. 43,573 (Aug. 21, 2019).
[2] Proposed Rule, 84 Fed. Reg. XX (October 9. 2019).
[3] NEFMC (May 2019) Atlantic Herring FMP Amendment 8 and its associated FEIS at 5-6.
[4] *See* Atlantic Herring Fishery Management Plan Amendment 8 and its Final Environmental Impact Statement, at 29. https://s3.amazonaws.com/nefmc.org/Herring-A8-FEIS.FINAL.pdf at 30-31.
[5] *Id.*

needs of Amendment 8 and will help ensure that the region's marine ecosystem and commercial fisheries remain robust well into the future in the face of climate change.

In 2016 NMFS updated its guidance on setting catch limits for forage fish. *See* 81 Fed. Reg. 71858 (Oct. 16, 2016). The National Standard 1 guidelines recommend councils "maintain[] adequate forage for all components of the ecosystem,"[6] including by "managing forage stocks for higher biomass than Bmsy to enhance and protect the marine ecosystem."[7] And when reducing MSY to account for ecological factors, "[s]pecies interactions that have not been explicitly taken into account when calculating MSY should be considered as relevant factors for setting OY [optimum yield] below MSY." [8] The guidelines also explain that "[a] control rule is a policy for establishing a limit or target catch level that is based on the best available scientific information and is established by the Council in consultation with its SSC."[9] "The ABC control rule should consider reducing fishing mortality as stock size declines below Bmsy and as scientific uncertainty increases, and may establish a stock abundance level below which fishing would not be allowed."[10]

These guidelines reflect the best available science which demonstrates that forage species, highly connected throughout the food web, should not be fished at maximum sustainable yield (MSY) because of the potential to reduce their populations to a fraction of historic sizes and the detrimental cascading effects that can occur throughout an ecosystem.[11] In the Northwest Atlantic Ocean ecosystem, Atlantic herring are forage for some of the most valuable and widely-recognized ocean predators.[12]

In the absence of complex multispecies models that could have provided relevant feedback, our organizations initially supported Alternative 2 as the alternative most likely to maintain a forage base for economically valuable predator fishes and the marine ecosystem.[13] Consistent with the MSA's requirement to base management measures on the "best scientific information available,"[14] Alternative 2 included: (1) a target biomass that maintains stock biomass at or above an appropriate target biomass for a key forage species (approximately 75 percent virgin biomass); (2) a maximum fishing mortality of 50 percent of F_{MSY}; (3) a cutoff biomass that temporarily suspends directed fishing if the stock biomass falls below an

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[6] 50 CFR 600.310 (e)(3)(iii)(A)(3).
[7] 50 CFR 600.310 (e)(2)(ii).
[8] *Id.*
[9] 50 CFR 600.310 (f)(1)(iv).
[10] 50 CFR 600.310 (f)(2).
[11] NOAA Fisheries, Stock Status as of December 31, 2017; Houde, *et al* (October, 2014) Managing Forage Fishes in the Mid-Atlantic Region, A White Paper to Inform the Mid-Atlantic Fishery Management Council, p. 4. *See also* Pikitch, *et. al.* (2012) Little fish, big impact. Lenfest Forage Fish Task Force. Lenfest Ocean Program; Smith, *et al.* (2011) Impacts of fishing low-trophic level species on marine ecosystems. *Science* 333:1147-1150, 1149; Pikitch, E. *et al.* (2014) The global contributions of forage fish to marine fisheries and ecosystems. *Fish and Fisheries*, 15, 43-64, p. 44; Cury PM et al., 2011. Global Seabird Response to Forage Fish Depletion—One-Third for the Birds. Science 334:1703-5; Marine Stewardship Council 2011. Assessment of Low Trophic Level (LTL) Fisheries; Essington TE et al 2015. Fishing amplifies forage fish population collapses. PNAS Early Edition; Plagányia EE, Essington 2014. When the SURFs up, forage fish are key. Fisheries Research **159**: 68–74.
[12] Amendment 8 FEIS at 87-91.
[13] Amendment 8 FEIS at 40.
[14] 16 U.S.C. § 1851(a)(2); 50 CFR 600.315 (a).

appropriate cut-off biomass (approximately 40 percent virgin biomass); and (4) a biomass-dependent catch rate that systematically adjusts the catch rate down as stock biomass falls below the target. The Management Strategy Evaluation conducted during the development of Amendment 8 demonstrated that this alternative would provide the least probability that herring would become subject to overfishing or overfished, maintain the highest spawning stock biomass, result in the fewest number of years when total biomass would fall below sustainable levels, and be most likely to maintain bluefin tuna weight and tern productivity.[15]

However, the 2018 benchmark stock assessment for Atlantic herring (SAW/SARC 65) demonstrated an alarming reversal of the prior "historic high biomass" estimates (2012 and 2015 stock assessments) and significant quota cuts were required, regardless of the new control rule adopted in Amendment 8.[16] Alarmingly, herring spawning stock biomass was estimated to be only ten percent of the maximum estimate over a nearly 50-year time series. Four of the six lowest age-1 recruitment estimates had occurred since 2013 - with the lowest in 2016 and the second lowest in 2017. And due to poor recruitment and low weight-at-age, the spawning stock biomass was expected to remain low for several years, increasing the likelihood that the stock would become overfished and subject to overfishing.[17] A new control rule that sets annual catch limits for herring below those set by the current status quo control rule (with a 50% probability of overfishing) is imperative to recover this stock and increase the likelihood that predator fish, marine mammals, seabirds, and the communities that depend upon a healthy marine ecosystem will not be harmed.

Recognizing the economic implications of the circumstances, our organizations support NMFS's approval and implementation of Alternative 4b Revised in Amendment 8. The proposed control rule includes a higher target biomass than the current status quo to account for the needs of predators, a biomass-dependent catch rate that adjusts the catch rate down as the stock falls below the target, and a cutoff biomass that temporarily suspends directed fishing if the stock biomass falls below the cut-off biomass. Specifically, Alternative 4b Revised has a maximum fishing mortality rate of 0.8 when SSB/SSB_{MSY} is above 0.5 (biomass is high), fishing mortality declines linearly when SSB/SSB_{MSY} falls below 0.5, and fishing mortality is set to zero if it reaches 0.1 (fishery cutoff).[18]

Alternative 4b Revised will provide valuable forage for depleted groundfish species under federal rebuilding programs (*e.g.,* Atlantic cod), marine mammals protected by federal laws and managed for population recovery (*e.g*., humpback and fin whales, harbor porpoise and Atlantic white-sided dolphins), seabirds including threatened and endangered species (*e.g.,* roseate and common terns as well as Atlantic puffins) and long-distance migrants such as Atlantic bluefin tuna hunting seasonally in the Gulf of Maine for herring, while also providing fishing opportunities and long term benefits for the directed herring and lobster fisheries (which use herring as bait).

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[15] *See* Amendment 8 FEIS at 230, 232, 236, 251, and 253.
[16] *See* Atlantic Herring SAW Working Group, SARC 65, Atlantic Herring Assessment for 2018, available at: https://www.nefsc.noaa.gov/nefsc/saw/.
[17] Recently, NMFS made a formal determination that Atlantic herring are approaching an overfished condition 84 Fed. Reg. 19,905 (May 7, 2019).
[18] *See* Amendment 8 FEIS at 42.

Alternative 4b Revised will set catch limits for Atlantic herring using an approach that is consistent with requirements of the Magnuson-Stevens Act and its National Standards, the National Standard 1 guidelines, the goals and objectives of the FMP as amended through Amendment 8, and the best available science for managing forage fish. It will also enhance ecosystem-based fisheries management in the Northeast region as recommended in NOAA Fisheries policies and its Northeast Regional Implementation Plan.[19] Our organizations urge approval and implementation as soon as possible.

II. NMFS SHOULD APPROVE AND IMPLEMENT A YEAR-ROUND MIDWATER TRAWL RESTRICTED AREA THAT PREVENTS LOCALIZED DEPLETION AND USER CONFLICTS NEARSHORE

As proposed, Alternative 10 creates an Inshore Midwater Trawl Restricted Area that prohibits midwater trawl gear year-round from the shoreline: (1) to a distance of 12 nm along the coasts of Maine, New Hampshire, Massachusetts, and Rhode Island from the U.S./Canada border south to roughly the RI/CT border; and (2) to distance of 20 nm in two 30-minute squares (99 and 114) due east and southeast of Cape Cod. This Alternative is consistent with both of the goals of Amendment 8 (account for the role of Atlantic herring within the ecosystem and address localized depletion) because it reduces fishing pressure nearshore where predators need herring and more directly addresses the spatial and temporal considerations of herring as forage. This measure will also help mitigate the negative socioeconomic impacts that high volume herring removals cause other user groups.

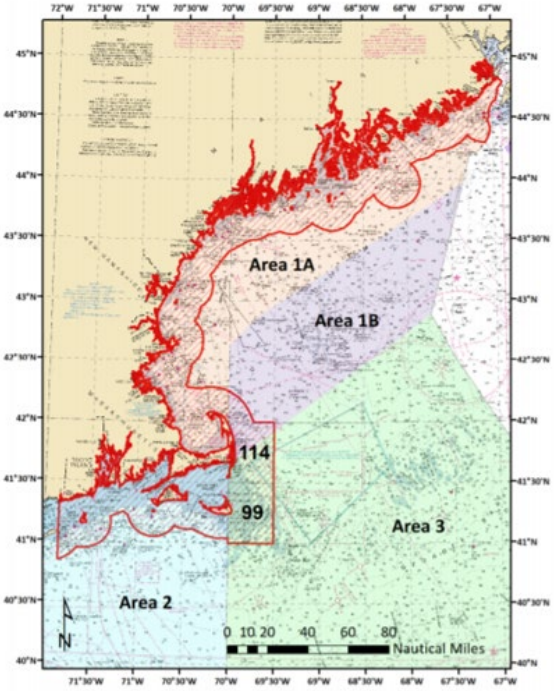

Figure 1: Alternative 10 (Proposed Action). See Amendment 8 FEIS at 68 (Map 8).

[19] *See* Northeast Regional Implementation Plan of NOAA Fisheries Ecosystem-Based Fisheries Management Roadmap, available at: https://www.fisheries.noaa.gov/national/ecosystems/ecosystem-based-fishery-management-draft-implementation-plans; *see also* National Marine Fisheries Service Policy Directive 01-120 (May 23, 2016) ("EBFM Policy"); NMFS Instruction 01-120-01 (November 17, 2016) ("EBFM Roadmap").

A. A Year-round Inshore Midwater Trawl Restricted Area has Biological, Ecological, and Economic Benefits

In 2007, the Council and NMFS took a precautionary approach to managing Atlantic herring in the inshore Gulf of Maine by establishing a purse seine/fixed gear only area in Atlantic Herring Management Area 1A.[20] Over the last decade, this measure has successfully prevented concentrated midwater trawl fishing effort in 1A during the summer months each year (June to September). Covering approximately 13,400 square miles and extending approximately 30-50 nautical miles from the shoreline, this closure has served to protect an important seasonal feeding area for whales, bluefin tuna, seabirds and other predators. This measure was implemented to address widespread concerns about the status of the inshore Atlantic herring stock component, the potential impacts of concentrated midwater trawl fishing effort resulting in localized depletion of this resource, and to maintain the health of the herring resource given its role in the ecosystem and the importance of the inshore area to the fishery.[21]

Those same concerns exist today. Although our groups previously supported a 50 nm buffer from shore, we can support Alternative 10 as proposed because it will provide additional benefits in Area 1A (as protections will be year-round out to 12 nm) as well as new and significant protections for nearshore areas in Areas 1B, 2, and 3 for the benefit of the marine ecosystem and numerous user groups in the region.

1. Year-round Protection for Spawning Atlantic Herring

The Atlantic Herring FMP currently manages herring as a single population although scientists recognize distinct inshore and offshore spawning components.[22] Protection of spawning grounds is essential to the long-term health of the herring resource, dependent fisheries, and a variety of ocean wildlife that rely on them as a source of food. Herring form shoals during site-specific spawning behavior and, in some cases these shoals are vast, making them especially vulnerable to high-volume fishing. Not only are aggregated adults vulnerable to fishing during spawning, but so too are their eggs, which form dense mats on the seabed where they develop over a period of time ranging from 6 to 40 days (time to hatching being dependent upon temperature).[23] Any gears that contact the bottom, including midwater trawl, will disturb the egg mats.[24]

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[20] *See* 50 C.F.R. §648.202: "Season and area restrictions. (a) *Purse Seine/Fixed Gear Only Area.* Vessels fishing for Atlantic herring may not use, deploy, or fish with midwater trawl gear in Area 1A from June 1 September 30 of each fishing year. A limited access herring vessel with midwater trawl gear on board may transit Area 1A from June 1-September 30, provided such midwater trawl gear is stowed and not available for immediate use as defined in §648.2. Vessels may use any authorized gear type to harvest herring in Area 1A from October 1 - May 31."

[21] *See* Amendment 1 to the Atlantic Herring FMP, at 93-99.

[22] Stevenson DK, Scott ML (2005) Essential fish habitat source document: Atlantic herring, Clupea harengus, life history and habitat characteristics (2nd edition). NOAA Tech Memo NMFS NE 192; 84 p.; McQuinn, I. H. (1997). Metapopulations and the Atlantic Herring. Rev. Fish Biol. Fish. 7:297-329.

[23] Collette BB, Klein-MacPhee G (2002) Bigelow and Schroeder's Fishes of the Gulf of Maine, 3rd edition, Smithsonian Institution Press, Washington. Page 150.

[24] Though nominally designed for pelagic fishing, bottom fishing by midwater trawls used for Atlantic herring has been documented repeatedly, most recently in Amendment 5 to the Atlantic Herring FMP. *See* Amendment 5 FEIS Vol. I at pp. ix, 226 ("midwater trawls and purse seines do occasionally contact the seafloor, and particularly in certain areas and at certain times of year when adult herring form pre-spawning aggregations near the bottom, these

More than 20 years ago, the Atlantic States Marine Fisheries Commission adopted a series of area closures to provide protection for spawning herring in the inshore Gulf of Maine during the summer and fall. Similar protections are lacking in important areas of Georges Bank and Nantucket Shoals. The protection of spawning components is critical to the successful management and sustainability of Atlantic herring. For example, the offshore Georges Bank component collapsed in the 1970s due to intensive fishing on spawning aggregations by foreign trawl fleets, and research suggests that recovery of the stock was fueled by increased spawning in neighboring Nantucket Shoals.[25]

Alternative 10's Inshore Midwater Trawl Restricted Area will offer refuge and allow for natural variability in spawning behavior, recognizing that climate change will magnify the uncertainties surrounding when and where fish will spawn. A year-round buffer in the Gulf of Maine affords stronger protections for the inshore stock throughout its reproductive seasons, including protection of pre-spawning aggregations, spawning fish, and developing eggs. Importantly, this buffer will incorporate some of the currently unprotected spawning grounds on Georges Bank and Nantucket Shoals.[26]

With respect to offshore spawning protections, we also support the development of the Council's most recently initiated framework adjustment to the Atlantic Herring FMP to expand spawning protections to Area 1B, Area 2, and Area 3 (see map below). We look forward to reviewing the final discussion document[27] and commenting on the potential range of alternatives as they are developed in 2020.

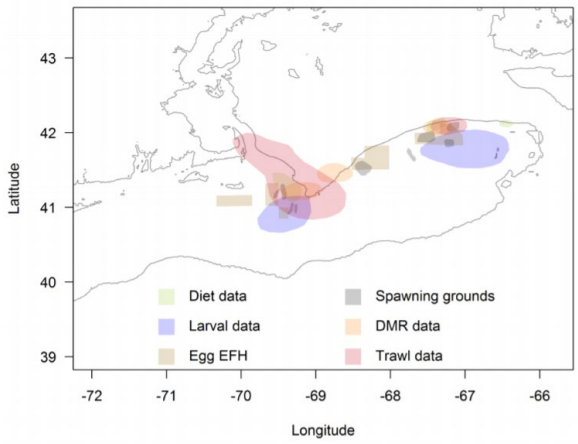

Figure 2: Areas of overlap between multiple data sources including data from food habits database, larval monitoring, egg EFH (figure 2.3), historical spawning grounds,

gears may adversely impact benthic habitats utilized by a number of federally-managed species, including EFH for Atlantic herring eggs.").

[25] Petitgas et al. (2010). Stock collapses and their recovery: mechanisms that establish and maintain life-cycle closure in space and time. – ICES Journal of Marine Science, 67: 1841–1848; Stevenson DK, Scott ML (2005) Essential fish habitat source document: Atlantic herring, Clupea harengus, life history and habitat characteristics (2nd edition). NOAA Tech Memo NMFS NE 192; Review and analysis of Atlantic herring (*Clupea harengus*) spawning on Georges Bank 2019 Discussion Document for the New England Fishery Management Council (working draft) at pp. 4 and 7.

[26] Overholtz *et al.* (2004) Stock Assessment of the Gulf of Maine - Georges Bank Atlantic Herring Complex, 2003. Northeast Fisheries Science Center Reference Document 04-06.

[27] https://s3.amazonaws.com/nefmc.org/3.-Draft-discussion-document-on-GB-spawning.pdf.

DMR dockside monitoring, and fall trawl survey.[28]

2. Protection of Nearshore Essential Fish Habitat

As described above, Atlantic herring plays a role in the Northwest Atlantic shelf ecosystem as prey for many of the region's most prized fish, including cod, haddock and bluefin tuna.[29] The species is of critical importance to the biology of Atlantic cod, and the relationship between the migration and spawning of Atlantic cod and the availability of herring has been well described in the scientific literature.[30] Not only are adult herring vital as food for cod and other groundfish, but their eggs and larvae are a major source of food for haddock.[31]

Under the Magnuson-Stevens Act, managers must protect EFH for all managed species including managed prey species like herring. As part of the Omnibus Essential Fish Habitat Amendment 2 (Habitat Amendment), the Council updated its EFH designations for all managed species, including maps that show the individual life history stages for each species.[32] Alternative 10 overlays EFH for Atlantic herring as well as the benthic life stages of nearly forty (40) other New England and Mid-Atlantic Council managed species.[33] Year-round protection of this nearshore area from localized depletion of herring will benefit the resource itself (Atlantic herring) and because herring itself is EFH as prey,[34] could benefit other council-managed species sensitive to herring removals including American plaice, Atlantic cod, halibut, haddock, pollock, white hake, silver hake, monkfish, and thorny, barndoor, little, and winter skates.[35]

In addition, Alternative 10 overlaps with several Habitat Areas of Particular Concern (HAPCs) identified in the Habitat Amendment because they are particularly vulnerable to fishing effects. These subsets of EFH have special conservation concerns due to their rarity, ecological importance, and/or vulnerability to degradation. NMFS recently approved the following HAPCs that overlap with Alternative 10 in whole or part: Atlantic Salmon HAPC, Inshore Juvenile Cod HAPC, Great South Channel Juvenile Cod HAPC, Cashes Ledge HAPC, and Jeffreys Ledge/Stellwagen Bank HAPC.[36] Both the Inshore Juvenile Cod HAPC and Great South

[28] *Id.* at 40.
[29] *See* Amendment 8 FEIS at 104.
[30] Richardson DE *et al.* (2014). The influence of forage fish abundance on the aggregation of Gulf of Maine Atlantic cod (*Gadus morhua*) and their catchability in the fishery. Can. J. Fish. Aquat. Sci. 71: 1349–62; Gulf of Maine Atlantic Cod (*Gadus Morhua*) Stock Assessment For 2012, Updated Through 2011. 55th SAW Assessment Report. Northeast Fisheries Science Center Reference Document 13-11; Ames EP (2010) Multispecies Coastal Shelf Recovery Plan: A Collaborative, Ecosystem-Based Approach. Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science **2**:217–231.
[31] Richardson et al. (2011) Role of egg predation by haddock in the decline of an Atlantic herring population. Proceedings of the National Academy of Sciences, 108 (33):13606-13611.
[32] Interactive maps of EFH for each species and life stage are on the NOAA EFH Mapper: http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html. Other details are in Volume 2 (designations), Appendix A (designation methods), and Appendix B (supplementary information) of OHA2 (http://www.nefmc.org/library/omnibus-habitat-amendment-2).
[33] Amendment 8 FEIS at 136 (Table 24).
[34] The regulatory definition of EFH acknowledges that prey, as part of the associated biological communities in the waters and substrate, may be considered a component of EFH for a species and/or life stage. *See* 50 C.F.R. 600.815 (a)(7) ("the definition of EFH includes waters and substrate necessary to fish for feeding.")
[35] *See* Amendment 8 FEIS at 384.
[36] 83 Fed. Reg. 15,240, 15,241 (April 9, 2018).

Channel Juvenile Cod HAPC span areas critical for juvenile and spawning overfished Atlantic codfish.

As NMFS noted when it approved the Habitat Amendment: "While there are no fishery restrictions associated with HAPC designations themselves, the designation should result in the Council taking a more precautionary approach to management of those areas, particularly when the only noted human-induced stress is fishing."[37] Alternative 10 would take such an approach.

3. Protection of Herring-Dependent Seabirds and Marine Mammal Predators

Atlantic herring is a major source food for certain marine mammals and numerous species of seabirds.[38] Studies have shown that declined prey availability can result in population declines and reduced reproductive success of dependent predators.[39] Seabirds are particularly vulnerable to reductions in food availability, especially during breeding because foraging trips are constrained by the need to return to nests to feed young. For example, in the Gulf of Maine, Atlantic herring in seabird diets are tightly linked to multiple measures of fishery- and survey-derived herring data.[40] Reduced availability of Atlantic herring has been linked to decreased survival of Atlantic puffins, breeding failures and colony abandonment in both Arctic and common terns, and reduced chick condition and breeding success in razorbills and common murres.[40] Amendment 8 states:

> Seabirds require access to reliable sources of forage fish throughout the year. Therefore, localized depletion of herring stocks could have a significant impact on their populations and reproductive success, when they are unable to shift to other high-quality prey. While non-breeding seabirds can move around northeast and mid-Atlantic US waters in search of food, nesting seabirds are closely tied to their breeding colonies throughout the nesting season. Breeding seabirds must locate food within commuting distance from the colony,

[37] 83 Fed. Reg. at 15,243.

[38] *See* Amendment 8 FEIS at 106, 355; *see also* Kenny et al. (1997) Estimates of prey consumption and trophic impacts of cetaceans in the USA northeast continental shelf ecosystem. Journal Northwest Atlantic Fisheries Science, 22: 155–171; Overholtz and Link (2007) Consumption impacts by marine mammals, fish, and seabirds on the Gulf of Maine-Georges Bank Atlantic Herring (Clupea harengus) complex during 1977-2002. ICES J. Mar. Sci. 64:83-96.

[39] Cury et al., 2011. Global Seabird Response to Forage Fish Depletion—One-Third for the Birds. Science 334:1703-5; Breton et al. 2014. Annual survival of adult Atlantic puffins *Fratercula arctica* is positively correlated with Herring *Clupea harengus* availability. Ibis (2014) **156**: 35-47; Frederiksen M, et al (2004) The role of industrial fisheries and oceanographic change in the decline of North Sea black-legged kittiwakes. J Appl Ecol 41: 1129–1139; Paredes R, et al. (2012) Proximity to multiple foraging habitats enhances seabirds' resilience to local food shortages. Mar Ecol Prog Ser 471: 253–269; Frederiksen, M., et al. 2008. Differential effects of a local industrial sand lance fishery on seabird breeding performance. Ecological Applications 18:70710; DeMaster, D.P., et al. 2001. Predation and competition: The impact of fisheries on marine-mammal populations over the next one hundred years. Journal of Mammalogy 82:641-651. Matthiopoulos, J., S. et al (2008) Getting beneath the surface of marine mammal-fisheries competition. Mammal Review 38(2-3):167-188; Bearzi, G., S. et al. (2008) Overfishing and the disappearance of short-beaked common dolphins from western Greece. Endangered Species Research 5:1-12.

[40] Breton et al. 2014. Annual survival of adult Atlantic puffins *Fratercula arctica* is positively correlated with Herring *Clupea harengus* availability. Ibis (2014) **156**: 35-47; Gaston et al (2009) Changes in Canadian seabird populations and ecology since 1970 in relation to changes in oceanography and food webs. Environ. Rev. 17: 267–286; Scopel et al. 2019. Varied breeding responses of seabirds to a regime shift in prey base in the Gulf of Maine. Marine Ecology Progress Series 626:177-196.

to successfully raise chicks. In recent years, the US Fish and Wildlife Service (USFWS) and their conservation partners have observed declines of 60-80% in tern and puffin productivity when preferred forage fish are not available to nesting birds. The USFWS has documented that breeding Arctic and common terns make 10-15 foraging trips per day, so any factor that increases search time or distance to forage fish could influence seabird productivity rates.[41]

Over 500,000 pairs of 25 marine bird species are found in the Gulf of Maine/Mid-Atlantic Bight region and non-breeding individuals number in the millions.[42] In the Gulf of Maine, about 7,000 pairs of Atlantic puffins nest on five islands: Machias Seal Island, Petit Manan Island, Seal Island, Matinicus Rock, and Eastern Egg Rock.[43] Recent research on the foraging habits of puffins revealed foraging ranges of approximately 13.5 nm (25 km) from the nesting colony, [44] but they may range as far as 27 to 54 nm (50-100 km).[45] Major nesting locations for roseate (a federally endangered species) and common terns are located off the coast of Massachusetts on Bird, Ram and Penikese Islands, which support one the largest tern populations on the Atlantic coast. Another key nesting site is Monomoy Island, which provides important habitat for roseate terns and supports the second largest nesting colony of common terns on the Atlantic seaboard. Terns feed primarily on forage fish, including Atlantic herring, and have been reported foraging 11-16 nm (20-30 km) away from breeding colonies (Figure 4).[46]

Source: USFWS unpublished data.

Figure 3: Location of tern colonies in the Northeast with active management. Amendment 8 FEIS at 121 (Map 13).

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[41] *See* Amendment 8 FEIS at 120.

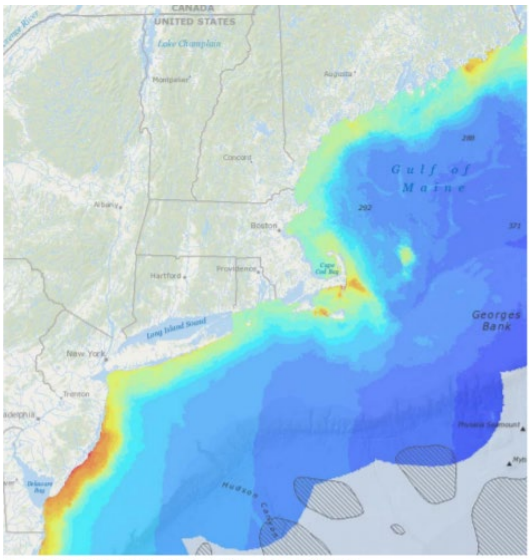
[42] Nisbet et al. 2013. Marine Birds of the Eastern USA and the Bay of Fundy: Distribution, Numbers, Trends, Threats and Management. Nuttall Ornithological Monographs #29: 1-188.

[43] Colby Environmental Policy Group. 2014. State of Maine's Environment 2014. Waterville, Maine: Colby College Environmental Studies Program.

[44] US FWS Northeast Region, Maine Refuge Practices Sound Science to Study Seabirds, available at https://usfwsnortheast.wordpress.com/2013/04/19/maine-refuge-practices-sound-science-to-study-seabirds.

[45] Harris, M.P. (1984) The Puffin. Poyser, London.

[46] Nisbet, Ian C. 2002. Common Tern (*Sterna hirundo*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/618; Heinemann, D. 1992. Foraging ecology of Roseate Terns on Bird Island, Buzzards Bay, Massachusetts. U.S. Fish and Wildl. Serv. Newton Corner, MA.



Source: NOAA National Centers for Coastal Ocean Science (NCCOS); http://www.northeastoceandata.org/data-explorer/?birds

Figure 4: Relative abundance of Common tern (summer only).[47]

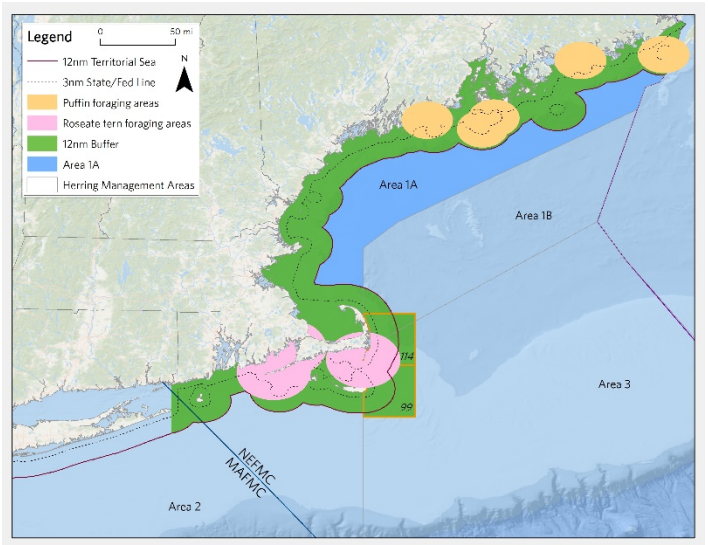


Figure 5: Overlap of Alternative 10 with puffin and Roseate tern foraging areas.[48]

The FEIS for Amendment 8 emphasizes that Atlantic herring also constitute an important food source for non-breeding seabirds including shearwaters, northern gannets, and razorbills stating:

> herring have been found regularly to make up a substantial component of the diet of Great Shearwaters at sea after post-breeding dispersal (Ronconi et al. 2010). In the Gulf of Maine, the tremendous diversity of non-breeding (i.e., great shearwaters) and migratory seabirds (i.e., northern gannets) far exceeds the number of seabirds that breed here (Diamond 2012). The area supports the most, if not all, of the North American population of razorbills (est. 52,000 pairs) in the winter, and nationally and internationally significant populations of Arctic terns and Atlantic puffins (USFWS unpublished data). These seabirds require persistent aggregations of high quality forage fish to meet the energetic demands of their annual life cycle.[49]

In addition to seabirds, a year-round prohibition on mid-water trawling would benefit herring dependent whales and other marine mammals migrating south in the fall as well as commercial tuna fishermen that fish outside of the months of the current prohibition (June-September).[50]

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[47] Amendment 8 FEIS at 129 (Map 14).
[48] Internally created map using data from: U.S. Fish and Wildlife Service Northeast Region, Maine Refuge Practices Sound Science to Study Seabirds, available at https://usfwsnortheast.wordpress.com/2013/04/19/maine-refuge-practices-sound-science-to-study-seabirds (puffin data); Nisbet, Ian C. 2002. (for roseate tern); and administrative/fisheries boundaries from NOAA Fisheries Science and Data, available at https://www.fisheries.noaa.gov/resources/data-and-maps.
[49] Amendment 8 FEIS at 122.
[50] *See* Amendment 8 FEIS at 67, 88, 193-196.

The protection of foraging areas, such as the one proposed in Alternative 10 is well recognized as an effective strategy for the conservation of spatially restricted foragers. There are a number of examples around the world where protective measures have been put in place to limit fishing in order to minimize impacts of localized depletion and promote successful foraging and reproduction.[51] For example, in Alaska, no trawl buffer zones of up to 20 nautical miles around Steller sea lion rookeries and haul outs have been established to protect sea lions from potential competition for prey.[52] Prohibiting high-volume, industrial midwater trawling within the proposed area will protect critical foraging areas from localized depletion while allowing seabirds, whales and other marine wildlife to flourish.

4. Reduces Incidental Catch of River Herring and Shad

Due to the high volume nature of the midwater trawl fishery and its co-occurrence with river herring, incidental catch of these four species (i.e., alewife and blueback herring and American and hickory shad) was of particular concern to us during the development of Amendment 8, particularly in Areas 1B and 2 where midwater trawling occurs year-round. Despite their depleted status, river herring are harvested and sold in the Atlantic herring fishery in substantial amounts.[53] Historically, river herring were a major component of the forage assemblage throughout the Mid-Atlantic and Northeast, but their numbers are a mere shadow of what they once were due to dams, incidental catch in at-sea fisheries, pollution, climate change, and other threats. Although not identified as targeted species, the midwater trawl fleet is responsible for the majority of incidental river herring and shad catch at sea (57%) in New England.[54]

During the development of Amendment 8, the Plan Development Team developed bycatch maps that overlaid observed bycatch events with the range of alternatives under consideration. These maps and the associated analysis demonstrate that the nearshore buffer in Alternative 10 would significantly reduce this catch, especially during certain times of the year.[55]

[51] Witherell et al. (2000) An ecosystem-based approach for Alaska groundfish fisheries. ICES Journal of Marine Science, 57: 771; Thaxter et al. (2012) Seabird Foraging Ranges as a Preliminary Tool for Identifying Candidate Marine Protected Areas. Biological Conservation 156: 53-61. Pichegru et al. (2012). Industrial Fishing, No-Take Zones and Endangered Penguins. Biological Conservation 156: 117–25; Ludynia et al. (2012) The Namibian Islands' Marine Protected Area: using seabird tracking data to define boundaries and assess their adequacy. Biological Conservation. 156, 136-145.

[52] NOAA Fisheries, Steller Sea Lion Protection Measures, available at: https://alaskafisheries.noaa.gov/sustainablefisheries/sslpm/.

[53] *See* Amendment 8 FEIS at 92.

[54] *See* Draft Omnibus Industry-Funded Monitoring Amendment, p. 101.

[55] *See* Amendment 8 FEIS at 326 ("As expected, most hauls with observed river herring catch were in nearshore areas (Map 34). There are some hauls with RH offshore on GB as well, but all tows with larger amounts of RH were from more nearshore areas.") and 327 (Map 34) (showing significant catch on the backside of Cape Cod).

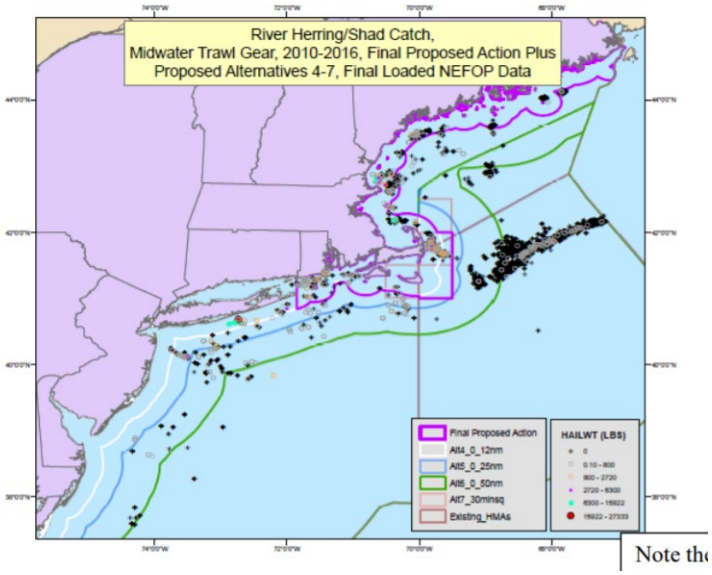


Figure 5: All observed hauls of river herring/shad bycatch in the herring MWT fishery (2010-2016) overlaid with Amendment 8 alternatives. The final proposed action (Alternative 10) is shown in dark purple. Amendment 8 FEIS Map 34.

5. Protection of Spawning and Juvenile Groundfish

Groundfish bycatch by herring midwater trawlers is an acknowledged concern among many stakeholders. Evidence of seafloor contact by trawl gear[56] validates concerns that this gear is being fished in close proximity to the bottom where rebuilding groundfish populations aggregate.[57] During the development of the Habitat Amendment, the Council's technical advisors (Closed Area Technical Team) conducted extensive analysis of the best available biological data to identify areas where juvenile and spawning fish occur in the highest densities which demonstrate how extremely important the inshore zone is for the production of groundfish, especially in the Gulf of Maine. [58] [59] Alternative 10 will close this high-density area

[56] *See* Amendment 8 FEIS at 380.

[57] *See* Amendment 5 FEIS Vol. I at 225: "Herring midwater trawls are not designed to fish on the bottom and do not normally contact the bottom, although information provided by herring fishermen indicates that the footrope, the belly of the net, and/or the weights do occasionally contact the bottom. Sometimes, when herring are in deep water near the bottom, midwater trawls are intentionally fished close to or in contact with the bottom. This occurs primarily in southern New England and the Mid-Atlantic during the winter (January-March)"

[58] Habitat Amendment FEIS, Volume 5, at 25, 26, 28 (Map 1); 33 ("In areas where localized spawning subpopulations exist and particularly where these subpopulations have been depleted, a localized reduction in groundfish mortality could increase the potential for recovery and rebuilding, particularly if non-fishing factors that affect growth and survival of groundfish have improved. Coupled with a reduction in effects on vulnerable habitat, this mortality reduction on localized subpopulations would be a positive impact, regardless of how and where fishing is redistributed."), 50, 52, and 72-74.

[59] Letter to Regional Administrator John Bullard from 111 Scientists, April 9, 2013; Dean M et al (2012) Disruption of an Atlantic Cod Spawning Aggregation Resulting from the Opening of a Directed Gill-Net Fishery. North American Journal of Fisheries Management **32**(1):124–134; Morgan MJ et al (1997) An observation on the reaction of Atlantic cod (*Gadus morhua*) in a spawning shoal to bottom trawling. Can J Fish Aquatic Sci **54** (1):217-223;

of juvenile and spawning groundfish to all midwater trawling activity, reducing the potential to disrupt spawning activity and decrease spawning success.

6. Economic Benefits to Predator-Dependent Industries

As Amendment 8 and its MSE demonstrate, management of Atlantic herring impacts a diverse group of stakeholders due to its critical role as food for many other animals in the ecosystem. Interested stakeholders include those with a commercial interest in the lobster, bluefin tuna, and groundfish fisheries, those involved in recreational fisheries for species such striped bass and bluefish, and those involved in whale watching, birding and other wildlife dependent activities. As herring midwater trawl fishing often occurs in the same areas and seasons as other fisheries and predator related businesses, removal of herring through high-volume fishing amounts to removing large amounts of food otherwise utilized by the predators that these stakeholders depend on in various ways.

For example, commercial and recreational fishermen depend on the presence of herring to attract striped bass, Atlantic cod, tuna and other large predatory fish their businesses use and enjoy. These stakeholders are directly and negatively impacted by localized depletion. As the FEIS notes: "Atlantic herring is vital to groundfish as a prey item in the ecosystem" and "bait for a minor subset of the commercial fishery," with over 400 communities serving as the home or landing port to one or more commercial Northeast groundfish fishing vessels since 2008.[60] For example, in 2015 alone, the commercial bluefin tuna fishery in the U.S. caught 856 mt with revenues of $8,820,000.[61] Atlantic herring is also vital to recreational fisheries as a prey species and a bait source, especially for anglers who fish from shore or on private and charter boats from Maine to New Jersey.[62] For the New England region, recreational fishing expenditures totaled an estimated $1.9 billion in 2016 alone.[63] A recent economic study concerning fisheries for striped bass, a major predator of herring that is currently overfished, concluded that recreational striped bass fishing in the New England states (Maine, Connecticut, Rhode Island, New Hampshire and Massachusetts) generated $2.6 billion in Gross Domestic Product (GDP) in 2016.[64] Extending the current 1A closure, spatially and temporally as proposed under Alternative 10, will help prevent localized depletion in that buffer area, and will keep herring from dispersing to other areas benefiting commercial and recreational fisheries.

Localized depletion also negatively impacts foraging opportunities for whales and seabirds, which in turn affects the wildlife-based tourism that has built up around viewing these animals.[65] New England is one of the most popular whale watching destinations in the world and a major part of the local tourism economy, accounting for $35 million in direct tourism dollars

Zemeckis DR et al (2014) Spawning Dynamics and Associated Management Implications for Atlantic Cod. North American Journal of Fisheries Management 34:424–42.

[60] *See* Amendment 8 FEIS at 205.

[61] *See* Amendment 8 FEIS at 182.

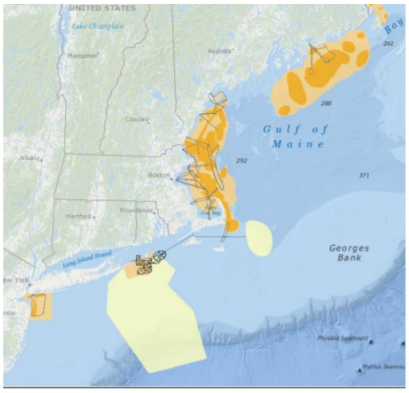
[62] *See* Amendment 8 FEIS at 206.

[63] National Marine Fisheries Service. 2018. Fisheries Economics of the United States, 2016. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-187a, 243 p.

[64] Southwick Associates. 2019. The Economic Contributions of Recreational and Commercial Striped Bass Fishing. A report produced for: The McGraw Center for Conservation Leadership. Revised April 12, 2019. 69 pp.

[65] *See* Amendment 8 FEIS at 193-196.

annually and attracting nearly 1 million visitors every year.[66] According to the FEIS: "As of 2017, there are 22 dedicated whale watching companies with 34 vessels from Maine to New Jersey and several in Delaware and Virginia (Table 71). There are about 30 smaller, charter whale watch operations as well in the Northeast (GARFO). Important ports for whale watching in the Gulf of Maine include Bar Harbor, Maine; Rye, New Hampshire; and Gloucester, Boston, and Provincetown, Massachusetts (Lee 2010)." Whale watching trips from April to October observe a large variety of marine mammals found off the New England coast, including fin whales, humpback whales, minke whales, pilot whales, harbor porpoise, Atlantic white-sided dolphins, harbor seals, and grey seals – all of which are considered important predators of herring.[67] Less available herring means fewer marine mammals available for observation and fewer boats and tours for specific operators. Alternative 10 would protect against localized depletion nearshore and offer benefits to the commercial whale watching operations in the region (shown below).



Source: Northeast Ocean Data Explorer, http://www.northeastoceandata.org/data-explorer/.

Legend:

- **Light orange = General use areas.** The full footprint of whale watch activity in 2010 – 2014.
- **Dark orange = Dominant use areas.** Areas routinely used by most users.
- **Lines = Transit routes.** Areas used for transit to and from general or dominant use areas.
- **Yellow = Supplemental areas.** Areas used for closely related activities and infrequent specialty trips.
- **Hatched = RI Ocean Special Area Management Plan areas.** Areas that are part of the Rhode Island Ocean Special Area Management plan and are symbolized separately to reflect different data collection methodologies.

Figure 6: Commercial Whale Watching Areas. Amendment 8 FEIS at 196 (Map 25).

As described in the FEIS, New England is a primary destination for seabird watching and it continues to increase "with trips concentrated in New Hampshire (e.g., Rye, Hampton), Massachusetts (Newburyport, Gloucester, Amendment 8 FEIS (May 2019) 197 and Provincetown; often in conjunction with whale watching).[68] In Maine alone, the value of seabird tourism was estimated at $5 - $10 million annually, with 120 tour operators offering 5,000 to 7,500 trips every year.[69] A nearshore closure to midwater trawl would protect prime feeding habitat for many of the region's wildlife, benefiting a growing tourism sector in New England that relies on a healthy and local abundance of whales, dolphins, seabirds and other marine life.

[66] O'Connor et al. (2009) "Whale Watching Worldwide: tourism numbers, expenditures and expanding economic benefits," a special report from the International Fund for Animal Welfare, Yarmouth MA, USA, prepared by Economists at Large.
[67] Overholtz and Link (2007) Consumption impacts by marine mammals, fish, and seabirds on the Gulf of Maine-Georges Bank Atlantic Herring (Clupea harengus) complex during 1977-2002. ICES J. Mar. Sci. 64:83-96.
[68] *See* Amendment 8 FEIS 196-198.
[69] *Id.*

Expanding current protections through Alternative 10 will help sustain the inshore herring stock, and benefit predator populations in the Gulf of Maine such as overfished Atlantic cod, overfished striped bass, bluefin tuna, seabirds, and whales as well as the businesses and communities that rely upon a healthy marine ecosystem.

B. Alternative 10 is Consistent with Applicable Law

NMFS has ample legal authority under the MSA and its National Standards to implement Alternative 10. This Midwater Trawl Restricted Area mirrors the precautionary approach taken by the Council and approved by NOAA Fisheries in 2007 when it established a purse seine-fixed gear only closure of the inshore Gulf of Maine (Area 1A) in Amendment 1.[70] Such an action at this time also balances the needs of user groups and is a fair compromise between the expected economic harm to the midwater trawl fleet and the conservation benefits to other users, with an overall net benefit to the Nation.[71]

The Magnuson-Stevens Act has several provisions relevant here. First, NMFS has an obligation under its EFH provision to identify EFH and "*other actions to encourage the conservation and enhancement of such habitat*." 16 U.S.C. § 1853(a)(9). Alternative 10 covers an area that includes EFH for Atlantic herring, overfished Atlantic cod, and numerous other managed species that eat herring. A fishing activity that reduces the availability of major prey species, either through direct harm or capture, or through adverse impacts to the prey species' habitat that ultimately reduces their population, may be considered an adverse effect on EFH, if such actions reduce the quality of EFH. Second, FMP's must contain measures "necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks and to protect, restore, and promote the long term health and stability of the fishery." 16 U.S.C. § 1853(a)(1). Especially, given the current status of the herring, midwater trawl gear that catches significant amounts of fish from a small area in the timeframes typical for this fishery has a negative impact on the long term sustainability of the resource. Finally, NMFS has authority to condition fishing and prepare an FMP that: "designate[s] zones where, and periods when, fishing shall be limited, or shall not be permitted, or shall be permitted only by specified types of fishing vessels or with specified types and quantities of fishing gear." 16 U.S.C. § 1853(b)(2)(A).

Amendment 8 is also consistent with the National Standards. While our organizations would have supported even more precautionary measures, Section 6.1 of the FEIS includes a robust discussion of the consistency of the Proposed Action with the National Standards which we support including consistency with:

- National Standard 1: Alternatives 4b will prevent overfishing while achieving OY because it limits fishing at 80 percent when herring biomass is high and reduces fishing mortality relatively quickly if biomass declines and cuts off fishing when biomass is

[70] Final Rule, 72 Fed. Reg. 11252 (Mar. 12, 2007). In justifying the measure NOAA Fisheries stated: "The Magnuson-Stevens Act gives considerable latitude to the Councils to develop management measures if, in the judgment of the Council, they conserve and manage a fishery resource." 72 Fed. Reg. at 11258.
[71] *See* Amendment 8 FEIS section 6.1 at 511-518.

extremely low. Alternative 10 will help prevent overfishing by preventing concentrated removals in nearshore areas and protecting inshore and offshore spawning components;

- National Standard 2: Alternatives 4b Revised and 10 are based on the best available science because they use the most recent estimates of stock status and bycatch for target and non-target species. Further, the models and analyses (MSE and stock assessment) were peer reviewed by an external panel of experts;
- National Standard 4: Alternatives proposed do not discriminate between residents of different states and are fair and equitable where a fisher can use midwater trawl, purse seine, small mesh bottom trawl, or weir gear when and where appropriate, the measures are reasonably calculated to promote conservation, and any hardship imposed on the midwater trawl fleet would be outweighed by benefits to other user groups;
- National Standard 5: To the extent Alternative 10 forces midwater trawl effort offshore reducing efficiency, a vessel could fish with different gear or at times when they are more likely to catch herring, and there will be increased efficiency for other users that could compensate for this loss;
- National Standard 7: Implementation of Alternative 4b Revised (a long term control rule) will minimize the costs and duplication of repeatedly considering and analyzing various ABC control rule alternatives in future specification cycles. Further, while Alternative 10 may increase costs for the midwater trawl fleet it will reduce costs for other businesses that rely on herring predators close to shore;
- National Standard 8: Amendment 8 takes the importance of Atlantic herring to all fishing communities in the region into account. Although Alternative 10 may have short term economic impacts for the directed herring fishery (all of the alternatives would have had this effect due to the status of the resource), it is expected to deliver long-term benefits to herring fishing communities as well as other user groups because it is more likely to prevent overfishing and achieve OY.

* * *

We thank you for the opportunity to comment on the Proposed Rule for Amendment 8 and urge approval and implementation as soon as possible.

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