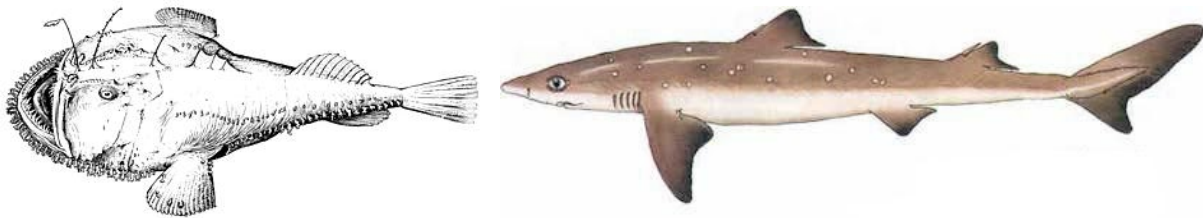


Joint Framework Action to Reduce Sturgeon Bycatch in Monkfish and Spiny Dogfish Fisheries

Monkfish Framework Adjustment 15 Spiny Dogfish Framework Adjustment 6



Environmental Assessment

July 9, 2024

Prepared by the
New England Fishery Management Council and the
Mid-Atlantic Fishery Management Council
in consultation with the
National Marine Fisheries Service



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MONKFISH AND SPINY DOGFISH FISHERY MANAGEMENT PLANS
MONKFISH FRAMEWORK ADJUSTMENT 15
SPINY DOGFISH FRAMEWORK ADJUSTMENT 6

Proposed Action: Propose management measures to reduce sturgeon bycatch in the commercial monkfish and spiny dogfish fisheries to ensure compliance with the Endangered Species Act.

Responsible Agencies: New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901

National Marine Fisheries Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce
Washington, D.C. 20235

For Further Information: Cate O’Keefe, Executive Director
New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, Massachusetts 01950
Phone: (978) 465-0492
Fax: (978) 465-3116

Chris Moore, Executive Director
Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901
Phone: (302) 526-5255
Fax: (302) 674-5399

Abstract:

The New England Fishery Management Council and the Mid-Atlantic Fishery Management Council, in consultation with NOAA Fisheries, have prepared Framework Adjustment 15 to the Monkfish Fishery Management Plan and Framework Adjustment 6 to the Spiny Dogfish Fishery Management Plan. This Environmental Assessment presents the range of alternatives to achieve the purpose and need of the action. The proposed action includes measures to reduce sturgeon bycatch in the commercial monkfish and spiny dogfish gillnet fisheries. This document describes the affected environment and valued ecosystem components and analyzes the impacts of the alternatives. This document also addresses other requirements of the National Environmental Policy Act, the Magnuson-Stevens Fishery Conservation and Management Act, the Regulatory Flexibility Act, and other applicable laws.

1.0 EXECUTIVE SUMMARY

The New England Fishery Management Council (NEFMC) and Mid-Atlantic Fishery Management Council (MAFMC) jointly manage the monkfish and spiny dogfish fisheries under the Monkfish and Spiny Dogfish Fishery Management Plans (FMPs), with the NEFMC having the administrative lead on monkfish and MAFMC having the administrative lead on spiny dogfish. The FMPs have been updated over time through a series of amendments, framework adjustments, and fishery specification actions. For amendments and frameworks (other than frameworks that set specifications) both Councils must approve any alternatives.

This action, Monkfish Framework Adjustment 15 (FW15) and Spiny Dogfish Framework Adjustment 6 (FW6), considers alternatives that would set management measures to reduce sturgeon bycatch in the commercial monkfish and spiny dogfish gillnet fisheries (Table 1). These measures are necessary to reduce the incidental take of endangered Atlantic sturgeon and ensure compliance with the Endangered Species Act (ESA).

Under the provisions of the MSA, Councils submit proposed management actions to the Secretary of Commerce for review. The Secretary of Commerce may approve, disapprove, or partially approve the action proposed.

This document describes a range of management alternatives (Section 4), the affected environment, which are defined as valued ecosystem components (VECs; Section 5), and the alternatives' expected impacts on the VECs (Section 6). The expected impacts of the alternatives on the VECs are derived from consideration of both the current conditions of the VECs and expected changes in fishing effort under each alternative.

Table 1. The four action alternatives are packages of time/area closures and/or gear restrictions for the federal monkfish and spiny dogfish fisheries. The time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal spiny dogfish or monkfish fishing permit. Methods and rationale for alternatives can be found in Section 4.0.

<i>Monkfish</i>	Polygon ¹	Measure	Time
Alternative 1	No Action		
Alternative 2	Southern New England	Closure	April 1 – May 31 & Dec. 1 – Dec. 31
	New Jersey	Closure	May 1 – May 31 & Oct. 15 – Dec. 31
		Low-profile gillnet gear	June 1 – Oct. 14 & Jan. 1 – April 30
Alternative 3	Southern New England	Closure	May 1 – May 31 & Dec. 1 – Dec. 31
	New Jersey	Closure	Dec. 1 – Dec. 31
		Low-profile gillnet gear	Jan. 1 – Nov. 30
Alternative 4	Southern New England	Closure	Dec. 1 – Dec. 31
	New Jersey	Closure	Nov. 1 – Nov. 30
		Low-profile gillnet gear	Dec. 1 – Dec. 31
Alternative 5*	New Jersey*	Low-profile gillnet gear	Year-round

<i>Spiny Dogfish</i>	Polygon ¹	Measure	Time
Alternative 1	No Action		
Alternative 2	New Jersey	Closure	May 1 – May 31 & Oct. 15 – Dec. 31
	DE / MD / VA	Closure	Nov. 1 – March 31
Alternative 3	New Jersey	Closure	Nov. 1 – Dec. 31
		Overnight soak prohibition	May 1 – May 31
	DE / MD / VA	Closure	Dec. 1 – Feb. 28
Alternative 4	New Jersey	Closure	Nov. 1 – Nov. 30
		Overnight soak prohibition	Dec. 1 – Dec. 31 & May 1 – May 31
	DE / MD / VA	Closure	Dec. 1 – Jan. 31
Alternative 5*	New Jersey	Overnight soak prohibition	May 1 – May 31 & Nov. 1 – Nov. 30
	DE / MD / VA	Overnight soak prohibition	Nov. 1 – March 31
Sub-Alt. 5a	New Jersey	Vessels using less than 5 ¼ inch gillnet mesh would be exempted from soak prohibition in Alt. 5	
Sub-Alt. 5b	DE/MD/VA*		

¹Hotspot area polygons are mapped in sections 4.2 through 4.4.

* Denotes preferred alternative

Proposed Action

The proposed action comprises the preferred alternatives summarized here, and which are detailed in Section 4.0.

Monkfish

The preferred alternative would adopt a year-round low-profile gear requirement in the New Jersey bycatch hotspot polygon for federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS). This measure would be implemented in both federal and state waters, however, the measure would only apply to vessels with a federal fishing permit. The implementation of this alternative would be delayed until January 1, 2026 to allow sufficient time for gear manufacturers to produce this gear for the commercial monkfish vessels. The delay would also allow additional time for the Harbor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear.

Spiny Dogfish

The preferred alternative would adopt an overnight soak time prohibition from 8pm until 5am for federal vessels targeting spiny dogfish in the New Jersey bycatch hotspot polygon in the months of May and November and in the Delaware/Maryland/Virginia bycatch hotspot polygons from November through March. There would be exemption for federal vessels using < 5.25" in the Delaware/Maryland/Virginia bycatch hotspot polygons (e.g., vessels using this smaller mesh would be allowed to do overnight soaks year-round; vessels using mesh ≥5.25" would be prohibited from doing overnight soaks from November through March). This measure would be implemented (no specific implementation delay recommended by Councils) in both federal and state waters, however, the measure would only apply to vessels with a federal fishing permit.

Impacts of the Proposed Action

The environmental impacts of the proposed action are summarized in Table 2 and detailed in Section 6.0.

Impacts on Target Species

The proposed action would likely have negligible to slight positive impacts on target species (monkfish and spiny dogfish; Section 6.2). In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to monkfish because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between monkfish catch in the control and experimental low-profile gillnet gear. In the spiny dogfish fishery, it is expected that fishermen would adapt to the proposed overnight soak prohibitions to minimize loss of spiny dogfish catch, possibly changing the areas they fish. Given the Decision Support Tool results showing small overall effort changes coastwide, any potential reductions in monkfish or spiny dogfish catch would be unlikely to change their statuses, even when accounting for exemptions for smaller mesh in the dogfish fishery.

Impacts on Non-Target Species

The proposed action would likely have negligible impacts on non-target species (Section 6.3). In the monkfish fishery, prior research studies using low-profile gillnet gear in the NJ area found there was no significant difference between winter skate catch (primary non-target species in the monkfish fishery) in the control and experimental low-profile gillnet gear. Spiny dogfish soak-time limitations would not be expected to change the status of any non-target species in a more than negligible fashion. The catch of non-target species is largely controlled through other FMPs.

Impacts on Protected Resources

The proposed action would likely have slight negative to moderate positive impacts on protected resources overall because there still would be some risk of interaction with protected resources, though the overall risk is reduced relative to status quo, especially for Atlantic sturgeon (Section 6.4). The use of low-profile gillnet gear year-round in the NJ sturgeon bycatch hotspot polygon beginning January 1, 2026, is expected to reduce the number of sturgeon incidentally captured in the gear. The prohibition on overnight soaks for vessels with a federal fishing permit targeting spiny dogfish in the NJ sturgeon bycatch hotspot polygon in the months of May and November, and a prohibition on overnight soaks in the DE/MD/VA bycatch hotspot polygons from November through March is similarly likely to benefit Atlantic sturgeon by reducing the amount of time that the gear could interact with sturgeon although the extent of the reduction is uncertain. More importantly, the overnight soak prohibition would effectively eliminate the likelihood of sturgeon mortality in the gear in all but exceptional circumstances.

Impacts on Physical Environment and Essential Fish Habitat

The proposed action would likely have negligible impacts on the physical environment and Essential Fish Habitat (EFH) because changes in gillnet effort will not affect the magnitude of habitat impacts associated with these two gillnet fisheries given gillnet gear does not cause adverse effects to EFH (Section 6.5).

Impacts on Human Communities

The proposed action's impacts on human communities would be negative to positive impacts on human communities (Section 6.6). Research indicated no significant difference in monkfish catch rates off NJ with the proposed low-profile gear so the baseline relative to the monkfish fishery should be maintained (positive impact). Overnight soak prohibitions in the spiny dogfish fishery off NJ may be feasible, thus, to the degree NJ participants can fish successfully with this gear restriction, the baseline relative to the spiny dogfish fishery should be maintained (slight positive impact). Overnight soak prohibitions in the spiny dogfish fishery off Delaware/Maryland/Virginia may not be feasible for Maryland/Virginia participants given their standard fishing practices that depend on overnight soaks, thus, it is likely these participants cannot fish successfully with this gear restriction (negative impact).

Alternatives to the Proposed Action

Besides the proposed action, other alternatives were considered and are detailed in Section 4.0.

Monkfish

Under No Action, no measures would be in place to reduce sturgeon bycatch; standard gillnet configurations would remain in place without any further tie-downs.

Spiny Dogfish

Under No Action, no measures would be in place to reduce sturgeon bycatch; overnight soaks would be permitted without any restriction.

Impacts of Alternatives to the Proposed Action

The environmental impacts of the alternatives to the proposed action are summarized in Table 2 and detailed in Section 6.0.

Impacts on Target Species

The No Action and Alternative 5 measures for both monkfish and spiny dogfish would have negligible impacts because the acceptable biological catches should not be exceeded, and the current stock status should be maintained. Low-profile gear is expected to result in similar levels of catch in the monkfish fishery and overnight soak prohibition is expected to result in adaptation to minimize any loss of spiny dogfish catch.

Impacts on Non-Target Species

The impacts of No Action and Alternative 5 measures on non-target species in both the monkfish and spiny dogfish fisheries would be negligible given prior studies on low-profile gear found no significant difference between winter skate catch (the primary non-target species in the monkfish fishery) in the control and experimental low-profile gillnet gear; spiny dogfish soak-time limitations is not expected to change the status of any non-target species.

Impacts on Protected Resources

The No Action would be negative and Alternative 5 measures on protected species would be less negative especially for Atlantic sturgeon. The requirement to use low-profile gillnet gear in the monkfish fishery off NJ has the potential to reduce sturgeon bycatch relative to No Action. The prohibition of overnight soaks in the spiny dogfish fishery off NJ and Delaware/Maryland/Virginia would reduce sturgeon bycatch mortality even though interactions would still occur. Impacts to other ESA-listed species would remain similar between No Action and Alternative 5.

Impacts on Physical Environment and Essential Fish Habitat

The No Action and Alternative 5 measures would have negligible impacts on the physical environment and EFH because gillnet gear does not have adverse effects on EFH.

Impacts on Human Communities

The socioeconomic impacts of No Action and Alternative 5 measures would have positive to negative impacts given there may be a similar level of monkfish catch between standard gillnet gear and the requirement to use low-profile gear, however, there is expected to be a difference in ability to adapt to overnight soak prohibition depending on the region.

Table 2. Summary of potential impacts of the alternatives under consideration in Monkfish Framework 15 and Spiny Dogfish Framework 6 across the valued ecosystem components. All expected impacts are described in detail in Section 6.

Alternatives	Direct and Indirect Impacts				
	Target Species	Non-target Species	Protected Resources	Physical Env. (EFH)	Human Communities
Alt. 1: No Action	Negligible to slight +	Negligible	Slight – to moderately -	Negligible to slight -	Socioeconomic: slight + to moderately +
Alt. 2: Most restrictive Sturgeon Package (most time/area closures & gear restrictions)	Negligible to slight +	Negligible to slight +	Moderately – to slight +	Negligible to slight -	Socioeconomic: high -
Alt. 3: Intermediate Sturgeon Package	Negligible to slight +	Negligible to slight +	Moderately – to slight +	Negligible to slight -	Socioeconomic: high -
Alt. 4: Less restrictive Sturgeon Package (least time/area closures & gear restrictions)	Negligible to slight +	Negligible to slight +	Moderately – to slight +	Negligible to slight -	Socioeconomic: slight – to high -
Alt. 5: Gear-Only Sturgeon Package (monkfish: low-profile gear requirement; spiny dogfish: overnight soak prohibition)	Negligible to slight +	Negligible	Moderately – to slight +	Negligible to slight -	Socioeconomic: high – to moderately +
<i>Sub-Alt. 5a: New Jersey <5.25” mesh exemption for overnight soak in spiny dogfish fishery</i>	Negligible to slight +	Negligible	Moderately – to slight +	Negligible to slight -	Socioeconomic: slight+
<i>Sub-Alt. 5b: DE/MD/VA <5.25” mesh exemption for overnight soak in spiny dogfish fishery</i>	Negligible to slight +	Negligible	Moderately – to slight +	Negligible to slight -	Socioeconomic: slight+
<i>Note: Preferred alternatives are shaded.</i>					

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2.4 ACRONYMS AND WORDING CONVENTIONS

“	inches
ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
ACT	Annual Catch Target
ASMFC	Atlantic States Marine Fisheries Commission or Commission
B	Biomass
BiOp	Biological Opinion
BOEM	Bureau of Offshore Energy Management
CAMS	Catch Accounting and Monitoring System
CFR	Code of Federal Regulations
CV	coefficient of variation
DAS	Days at Sea
DPS	Distinct Population Segment
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973
F	Fishing Mortality Rate
FMAT	Fishery Management Action Team
FMP	Fishery Management Plan
FR	Federal Register
FW	Framework
GB	Georges Bank
GOM	Gulf of Maine
ITS	Incidental Take Statement
M	Natural Mortality Rate
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum Sustainable Yield
MT (or mt)	Metric Tons (1 mt equals about 2,204.62 pounds)
MTA	Management Track Assessment
NE	Northeast
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NFMA	Northern Fishery Management Area
NMFS	National Marine Fisheries Service (NOAA Fisheries)
NOAA	National Oceanic and Atmospheric Administration

OFL	Overfishing Level
OLE	Office of Law Enforcement
OY	Optimum Yield
PBR	Potential Biological Removal
PDT	Plan Development Team
RPM	Reasonable and Prudent Measure
RTA	Research Track Assessment
SFMA	Southern Fishery Management Area
SSC	Scientific and Statistical Committee
TAL	Total allowable landings
T&C	Terms and Conditions
TRT	Take Reduction Team
U.S.	United States
VEC	Valued Ecosystem Components
VMS	Vessel Monitoring System
VTR	Vessel Trip Report

3.0 BACKGROUND AND PURPOSE

3.1 BACKGROUND

All five Atlantic sturgeon distinct population segments (DPS) in the United States are listed as endangered or threatened under the Endangered Species Act (ESA). The primary threats to these DPSs are entanglement in fishing gears, habitat degradation, habitat impediments, and vessel strikes.

On May 27, 2021, NOAA's National Marine Fisheries Service (NMFS) issued a Biological Opinion (Opinion) on the authorization of eight federal fishery management plans (FMPs), two Interstate Fishery Management Plans (ISFMPs) and the New England Fishery Management Council's Omnibus Essential Fish Habitat Amendment 2. The eight FMPs considered are the: Atlantic Bluefish; Atlantic Deep-sea Red Crab; Mackerel, Squid, and Butterfish; Monkfish; Northeast Multispecies; Northeast Skate Complex; Spiny Dogfish; and Summer Flounder, Scup, and Black Sea Bass FMPs. The Opinion evaluated the effects of the action on ESA-listed species, including all five DPS of Atlantic sturgeon, and designated critical habitat.

Section 9 of the ESA prohibits the take, including the incidental take, of endangered species. Pursuant to section 4(d) of the ESA, NMFS has issued regulations extending the prohibition of take, with exceptions, to certain threatened species. NMFS may grant exceptions to the take prohibitions with an incidental take statement (ITS) or an incidental take permit issued pursuant to ESA section 7 and 10, respectively. Take is defined as "to harass, harm, pursue, hunt, shoot, capture, or collect, or to attempt to engage in any such conduct."

The ESA defines incidental take as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of sections 7(b)(4) and 7(o)(2), incidental take is not considered to be prohibited under the ESA provided that it is in compliance with the terms and conditions of an ITS. The 2021 Opinion includes an ITS which specifies the level of incidental take of Atlantic sturgeon anticipated in the federal fisheries and defines reasonable and prudent measures (RPMs) and implementing terms and conditions (T&C), which are necessary or appropriate to minimize impacts of the incidental take. The RPMs and T&Cs are non-discretionary and must be undertaken in order for the exemption to the take prohibitions to apply.

The RPMs/T&Cs of the Opinion included that NMFS convene a working group to review all the available information on Atlantic sturgeon bycatch in the federal large mesh gillnet fisheries and develop an Action Plan by May 27, 2022, to reduce Atlantic sturgeon bycatch in these fisheries by 2024. Additionally, the Opinion requires that this Action Plan include an evaluation of information available on post-release mortality, identification of data needed to better assess impacts, and a plan, including timeframes, for obtaining and using this information to evaluate impacts.

The Opinion did not specify the extent of bycatch reduction that must occur as a result of this Action Plan. However, RPMs are those actions that are necessary or appropriate to minimize impacts (i.e., amount or extent) of incidental takes. As a result, measures must be developed that minimize impacts. However, ESA regulations specify that RPMs involve only a minor change and be consistent with the basic design, location, scope, duration, or timing of the action, which in this case is the typical operation of the relevant fisheries.

The Working Group conducted a review of available information regarding Atlantic sturgeon distribution, bycatch in gillnet gear, bycatch mitigation, and post-release mortality. From this review, the working group produced the Action Plan to Reduce Atlantic Sturgeon Bycatch in Federal Large Mesh Gillnet Fisheries, which recommended that the New England and Mid-Atlantic Fishery Management Councils (Councils), in coordination with the National Marine Fisheries Service and the Atlantic States Marine Fisheries Commission, consider a range of potential measures to reduce Atlantic sturgeon bycatch in

federal gillnet fisheries using large mesh gear, defined as greater than or equal to 7 inches. The Councils agreed to focus on spiny dogfish and monkfish because they are jointly managed, and the action plan identified these fisheries as two of the highest contributors to sturgeon bycatch in gillnet fisheries.

The Action Plan does not prescribe the measures that must be used, but provided recommendations based on the information available and considered on Atlantic sturgeon bycatch. These recommendations were: 1) requirements to use bycatch-mitigating low-profile gillnet gear; 2) reductions in soak time for gillnet gear; and 3) implementation of time/area measures, particularly gear restricted areas, in regions where Atlantic sturgeon bycatch is most common.

During the course of developing this action, the Councils were made aware that [new estimates \(Hocking 2023¹\)](#) showed the bycatch of Atlantic sturgeon in gillnet gear exceeded the level exempted in the ITS of the 2021 Opinion. Due to the ITS exceedance, NMFS reinitiated consultation as required by the Endangered Species Act (ESA) on eight Federal Fishery Management Plans (FMPs) on September 13, 2023. It should be noted that the updates also changed the estimates used to develop the exempted take levels in the ITS (all new information will be considered during the next Biological Opinion development). Regardless, the intent is for the resulting bycatch reduction measures in the Councils' action to be considered during the re-initiated consultation process to the extent feasible. [GARFO subsequently provided guidance](#) on bycatch percentage reductions needed to return take levels to those authorized in the ITS (though again, the estimates used to develop the ITS have also changed).²

3.2 PURPOSE AND NEED

The purpose of this action is to implement management measures to reduce the bycatch of Atlantic sturgeon in the monkfish and spiny dogfish gillnet fisheries based on the best scientific information available. This action is needed to reduce incidental takes per the Action Plan developed after the 2021 Biological Opinion to allow for the continued authorization of the fisheries in compliance with the Endangered Species Act (Table 3).

The range of alternatives described in this document is based on the types of alternatives the NEFMC and MAFMC approved during their September/October 2023 meetings, respectively. The FMAT/PDT then provided input on several packages of alternatives that the Councils endorsed at their January/February 2024 meetings for consideration via this document.

Table 3. Purpose and need for Monkfish Framework Adjustment 15 and Spiny Dogfish Framework Adjustment 6.

Need for Monkfish Framework 15, Spiny Dogfish Framework 6	Corresponding Purpose for Monkfish Framework 15, Spiny Dogfish Framework 6
To address the 2021 Biological Opinion reasonable and prudent measures to allow for the continued authorization of the monkfish and spiny dogfish fisheries in compliance with the Endangered Species Act.	Specify measures that would reduce the incidental take of endangered Atlantic sturgeon in the federal monkfish and spiny dogfish fisheries.

¹ Available at: https://mafmc.squarespace.com/s/sturgeon_report_state_fed.pdf

² See “Take Reduction Recommendations for Atlantic Sturgeon in Federal Gillnet Fisheries, GARFO Protected Resources Division to Sturgeon Bycatch FMAT/PDT; transmitted 12/04/2023” available at <https://www.mafmc.org/s/Sturgeon-Update-Dec-2023.pdf>

4.0 ALTERNATIVES UNDER CONSIDERATION

The Councils considered the alternatives in this section. Alternatives considered but rejected are briefly described in Section 4.6. The four action alternatives are packages of time/area closures and/or gear restrictions for the federal monkfish and spiny dogfish fisheries. These alternatives are designed to represent a robust range of measures:

Alternative 1: No action.

Alternative 2: Most restrictive time/area closures and gear restriction measures.

Alternative 3: Intermediate time/area closures and gear restriction measures.

Alternative 4: Less restrictive time/area closures and gear restriction measures.

Alternative 5: Only gear restriction measures.

The alternatives were constructed as packages to allow for meaningful analyses of the impacts of the measures that might be implemented. Considering every possible combination would have resulted in tens of thousands of permutations that would have been impossible to analyze in a meaningful and timely manner. All packages cover multiple sturgeon take hotspots so that effects on sturgeon on the fisheries are spread geographically across the various areas of higher sturgeon takes.

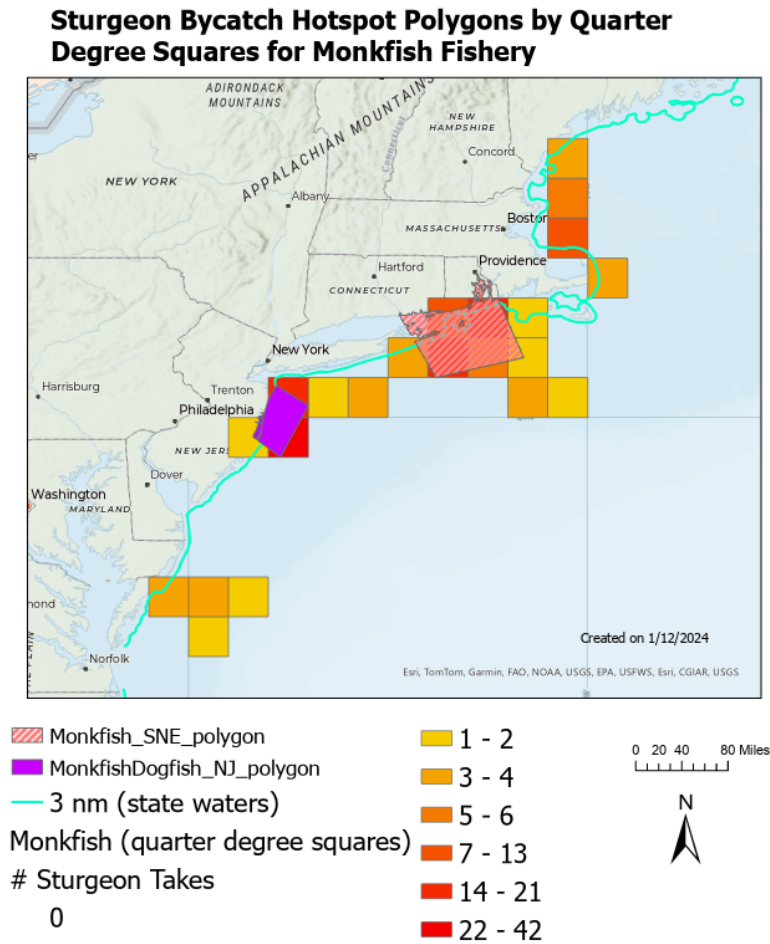
The time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal spiny dogfish or monkfish fishing permit. The Atlantic States Marine Fisheries Commission (ASMFC) is expected to consider complementary action to reduce sturgeon interactions by state vessels in state waters.

Methods for determining the sturgeon bycatch polygons where time/area closures and gear restrictions would apply

To map sturgeon take hotspots, sturgeon takes summed across 2017-2019 and 2021-2022 were quantified by 10-minute squares and shaded accordingly. Given these 10-minute squares represent confidential data, only quarter degree squares with shading are included in Figure 1 and Figure 2. The Councils were primarily interested in encompassing the bycatch hotspots with a 1-mile buffer approximately based on straight lines parallel to shore (estimating 6-9 miles offshore).

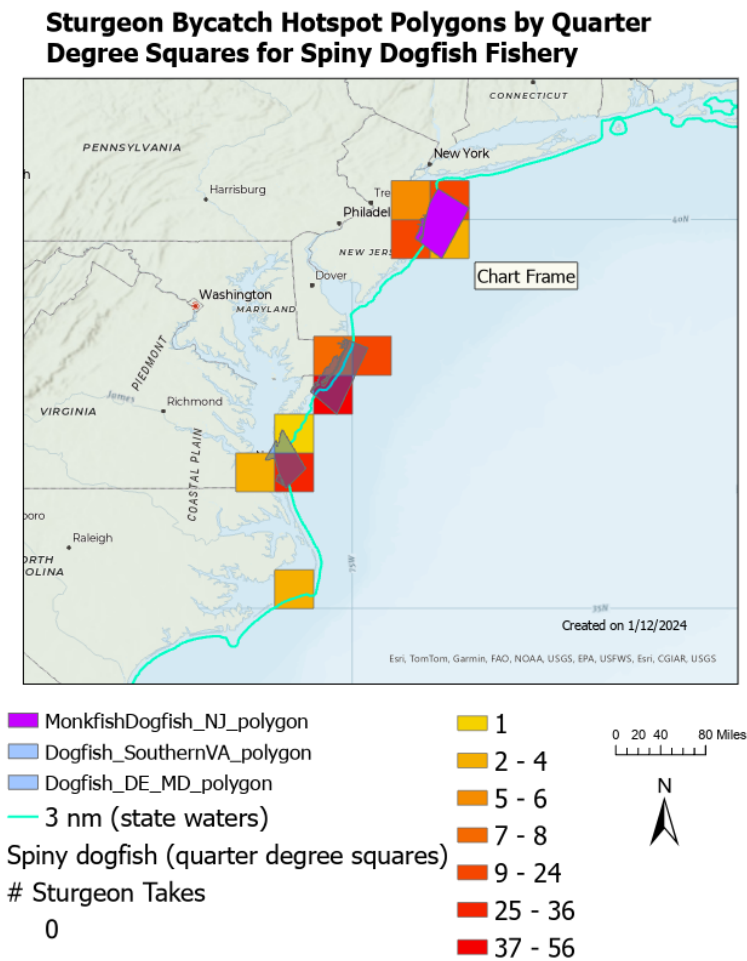
- Orange and red squares represent areas with higher takes, and groupings of these darker squares were considered hotspots. The edges of hotspots often appeared as yellow ten-minute squares.
- Boundaries of the polygons were drawn using the following criteria: If the outer-most edge of a hotspot cluster is an orange or red ten-minute square, the boundary line extends approximately one mile beyond the edge of the square. This allows for some buffer to address the potential for shifting effort. If the outer edge is a yellow ten-minute square, the boundary line is drawn at least approximately one mile out from the point where a take occurred in that yellow square. This was because yellow squares represented fewer takes and were often already on the edge of a hotspot rather than within a hotspot. Note that there are some instances where the boundary line is larger than 1 mile given the initial criteria to draw boundaries from the edges of the red and orange ten-minute squares.
- The western area boundaries were clipped to the shore for all hotspot locations to prevent shifting effort into shallower state waters where there will likely be sturgeon present. Note, this Council action only applies to vessels with a federal fishing permit targeting monkfish and spiny dogfish in federal and state waters; ASMFC is expected to take complementary action for state only vessels fishing in state waters.
- The offshore portion of the polygon latitude and longitude values were then rounded to either the nearest 0.05 or 0.1 to help improve implementation of measures and enforcement.

Figure 1. Sturgeon bycatch hotspots in the monkfish fishery; shown as quarter degree squares due to data confidentiality.



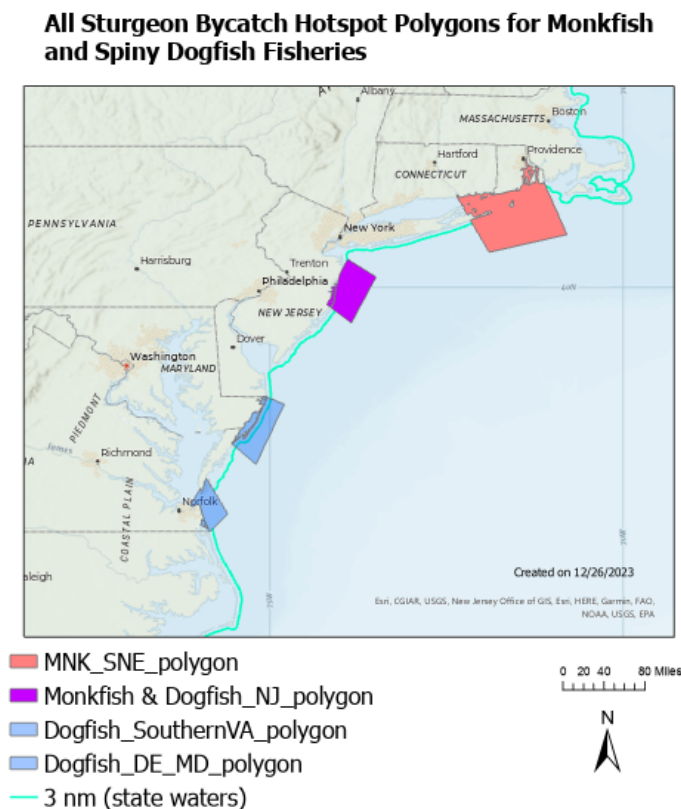
Data source: 2017-2019 and 2021-2022 observer data.

Figure 2. Sturgeon bycatch hotspots in the spiny dogfish fishery; shown as quarter degree squares due to data confidentiality.



Data source: 2017-2019 and 2021-2022 observer data.

Figure 3. All sturgeon bycatch hotspot polygons for the monkfish and spiny dogfish fisheries.



For monkfish gear measures, a January 1, 2026, implementation date is used, based on input from the fishing industry about the time needed to procure new gear with the required specifications. This delay would also allow for the Harbor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear which would use 0.81 mm versus 0.90 mm that is currently required for large-mesh gillnets ($\geq 7''$) in the Harbor Porpoise regulations during applicable months (January-April).

Note: observed sturgeon interactions were based on:

- Hauls where monkfish and spiny dogfish are caught and recorded by the observer as either TARG1 or TARG2 species for gillnet trips. Monkfish and skate are caught on the same trips, so it is important to include records where monkfish is not listed as the TARG1 species, for example. This is consistent with what was done in the Sturgeon Action Plan.
- Only records that denote 'spiny dogfish' as target species and exclude records for 'smooth dogfish' and 'unknown' records. Spiny dogfish is the only dogfish species managed by the MAFMC.
- Data subset by mesh size groups: 1) $< 5''$ (" = inches for measurements hereafter), 2) $\geq 5'' - < 7''$, and 3) $\geq 7''$ based on how the spiny dogfish and monkfish fisheries operate. Note: there were no recorded takes in mesh size $< 5''$, so the mesh size groups hereafter are: $\geq 5'' - < 7''$ and $\geq 7''$.
- Data from 2017-2019 and 2021-2022 were included to evaluate the most recent five years of observer data to adequately account for interannual variability, excluding 2020 when observer coverage was very low due to the global pandemic, and to help be consistent with the new Biological Opinion which is likely to use the same set of years.
- Data source: unpublished observer data and CAMS trip data from 2017, 2018, 2019, 2021, 2022.

There were 175 observed sturgeon takes in the monkfish fishery and 180 observed sturgeon takes in the spiny dogfish fishery, based on the previously described methodology and fishery definitions. In the alternative rationales below, the percent of observed sturgeon takes in a given month and polygon are based on the number of observed sturgeon takes in just the relevant fishery. For example, there were 6 observed sturgeon takes in the monkfish fishery in the SNE polygon in April, which represents 3% of total observed takes in the monkfish fishery (6 out of 175 total observed takes in the monkfish fishery).

Note: Low-profile gillnet gear mentioned below is defined based on research by Fox et al. (2012 and 2019) and He and Jones (2013) in New Jersey:

- Mesh size ranging from 12 to 13 inches,
- Net height ranging from 6 to 8 meshes tall,
- Net length of 300 feet,
- Tie-down length of 1³,
- Tie-down spacing of 12 feet,
- Primary hanging ratio of 0.50,
- Twine size 0.81mm, and
- Net is tied at every float to keep float line down.

General Observer Coverage in Relevant Areas

The statistical areas that are most relevant for the polygons include 539, 537, 613, 612, 615, 614, 621, 625, and 631. For each statistical area, the number of commercial trips and the number of observed trips from [2017, 2018, 2019, 2021, 2022 (not 2020)] were tallied and compared. For spiny dogfish, commercial trips were tallied based on if spiny dogfish made up at least 40% of the landed weight. Monkfish commercial trip counts were based on landing monkfish and using $\geq 10''$ mesh. Tallies of observed trips were based on species targeted (target species 1 or 2 indicated as the relevant species). Trip counts and coverage levels for statistical areas near relevant polygons are provided for each fishery in Table 4 and Table 5.

Table 4. Spiny Dogfish Observer Coverage Summary.

Statistical Area	Polygon Proximity	Spiny Dogfish Commercial Trips	Spiny Dogfish Observed Trips	Percent Observer Coverage
612	NJ	591	61	10%
615	NJ	369	72	20%
614	NJ	626	105	17%
621	MD/VA	827	102	12%
625	MD/VA	1232	79	6%
631	MD/VA	2633	308	12%

Data source: unpublished observer data and CAMS trip data from 2017, 2018, 2019, 2021, 2022; accessed January 2024.

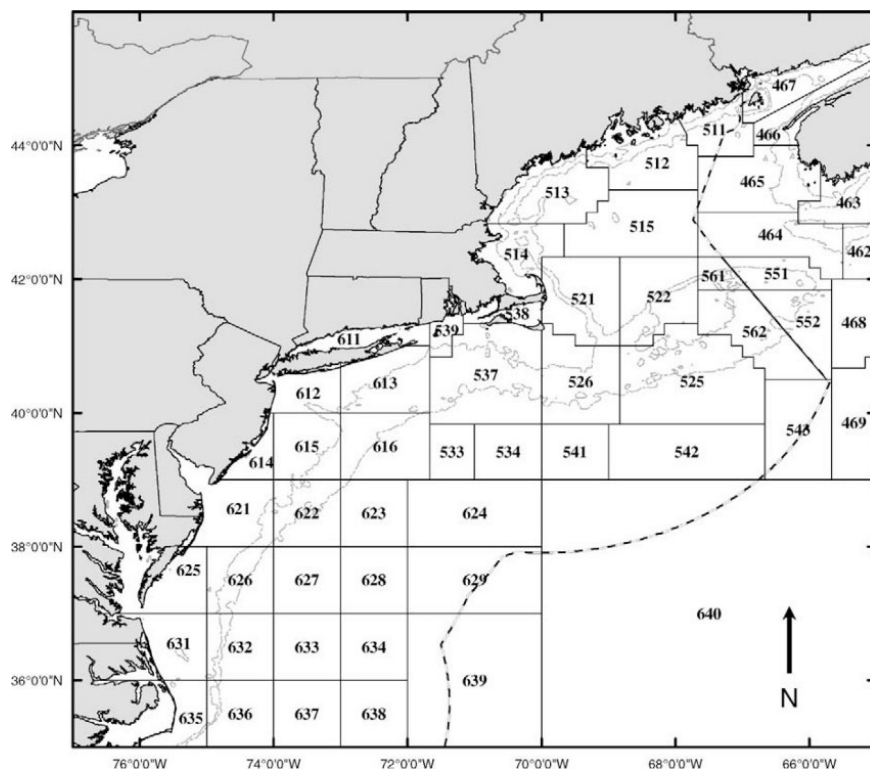
³ The Harbor Porpoise regulations specify a 48" maximum tie-down length during the specified months; the FMAT wanted to accommodate these regulations and also enable ongoing/future research on testing low-profile gear with different tie-down lengths.

Table 5. Monkfish Observer Coverage Summary.

Statistical Area	Polygon Proximity	Monkfish Commercial Trips	Monkfish Observed Trips	Percent Observer Coverage
539	SNE	882	92	10%
537	SNE	3439	441	13%
613	SNE	2316	260	11%
612	NJ	772	86	11%
615	NJ	1229	136	11%

Data source: unpublished observer data and CAMS trip data from 2017, 2018, 2019, 2021, 2022; accessed January 2024.

Figure 4. NMFS Statistical Areas.



4.1 ALTERNATIVE 1 - NO ACTION

Under Alternative 1 (No Action), the current federal measures for the monkfish and spiny dogfish gillnet fisheries would remain – new measures to reduce sturgeon bycatch would not be implemented in 2024 through Council action. This alternative would not follow the sturgeon action plan’s recommendation for developing measures to reduce sturgeon bycatch. The action plan laid out two possible paths to achieve a reduction in sturgeon bycatch by 2024. The recommended path was through action by the MAFMC and the NEFMC. Selection of Alternative 1 (No Action) by the Councils may mean that NMFS takes action via a second path, under ESA rule-making processes.

4.2 ALTERNATIVE 2 – MOST RESTRICTIVE STURGEON PACKAGE (MOST TIME/AREA CLOSURES AND GEAR RESTRICTIONS)

Under Alternative 2, there would be a broad array of time/area closures and gear restrictions for both the federal monkfish and spiny dogfish gillnet fisheries in the Atlantic sturgeon bycatch hotspot areas (Figure 5, Figure 6, Figure 7).

The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) using $\geq 10''$ mesh size and vessels with federal spiny dogfish permits using gillnet gear with mesh size of $5 - < 10''$. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon to be implemented on January 1, 2026.

The polygons where the closures and gear restrictions would apply are the same for both the monkfish and spiny dogfish fisheries off New Jersey to help simplify the measures and to acknowledge that sturgeon are caught in this area by both fisheries. There are two Delaware/Maryland/Virginia bycatch polygons because of the two concentrations of observed sturgeon takes. The observed sturgeon takes occurred during similar times of the year, thus, the same closure and gear restriction measures would be the same across both polygons. No specific implementation delay was recommended by the Councils for the spiny dogfish measures.

More specifically, Alternative 2 includes the following time/area closures and gear restrictions:

Vessels with a federal fishing permit targeting monkfish in federal and/or state waters

- Closure in Southern New England (SNE) bycatch hotspot polygon (Figure 5) during **April 1 – May 31**, and **December 1 – December 31**.
- Closure in New Jersey bycatch hotspot polygon (Figure 6) during **May 1 – May 31**, and **October 15 – December 31**.
- Low-profile gillnet gear requirement in New Jersey bycatch hotspot polygon (Figure 6) in the rest of year when above polygon closure is not in effect (**June 1 – October 14 and January 1 – April 30**).

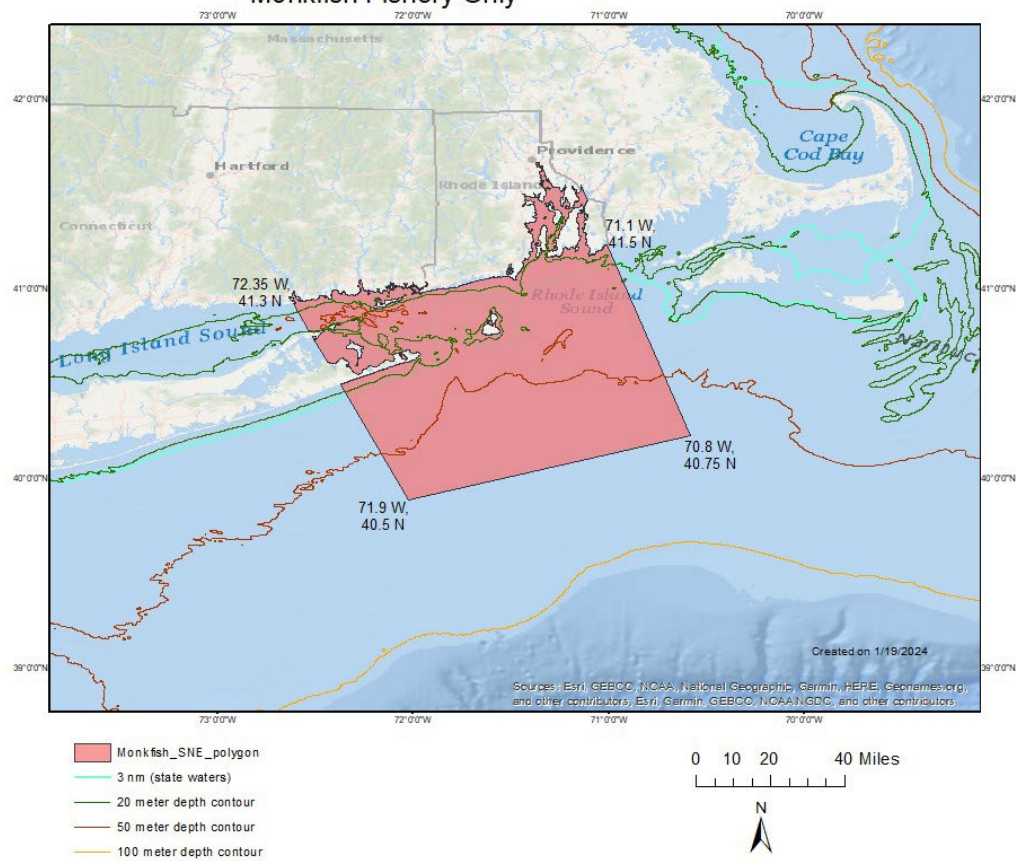
Vessels with a federal fishing permit targeting spiny dogfish in federal and/or state waters

- Closure in New Jersey bycatch hotspot polygon (Figure 6) during **May 1 – May 31** and **October 15 – December 31**.
- Closure in the Delaware/Maryland/Virginia bycatch hotspot polygons (Figure 7) during **November 1 – March 31**.

These time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal fishing permit. The Atlantic States Marine Fisheries Commission (ASMFC) is expected to take complementary action to reduce sturgeon interactions by state vessels in state waters.

Figure 5. Southern New England sturgeon polygon applicable only to the federal monkfish fishery.

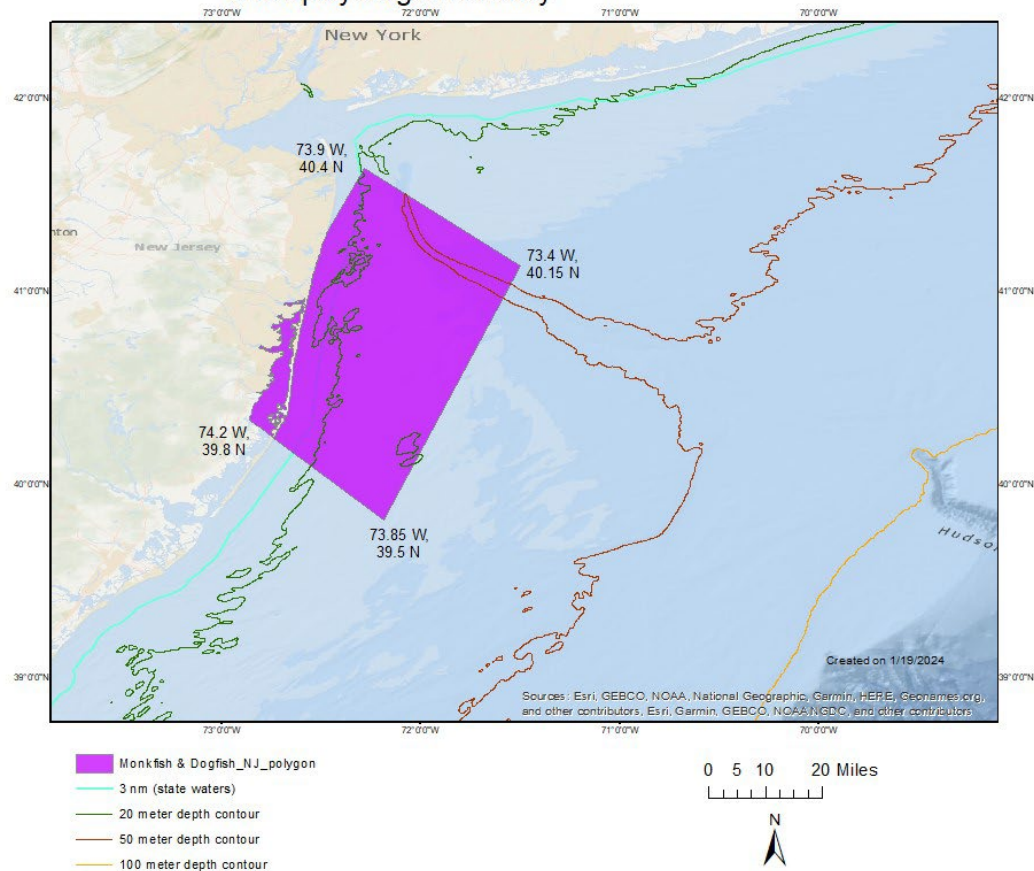
**Southern New England Bycatch Hotspot Polygon -
Monkfish Fishery Only**



Note: The same figures are repeated in each action alternative, so the reader does not have to search for figures in other parts of the document. Accordingly, Figure 5, Figure 8, and Figure 11 are identical.

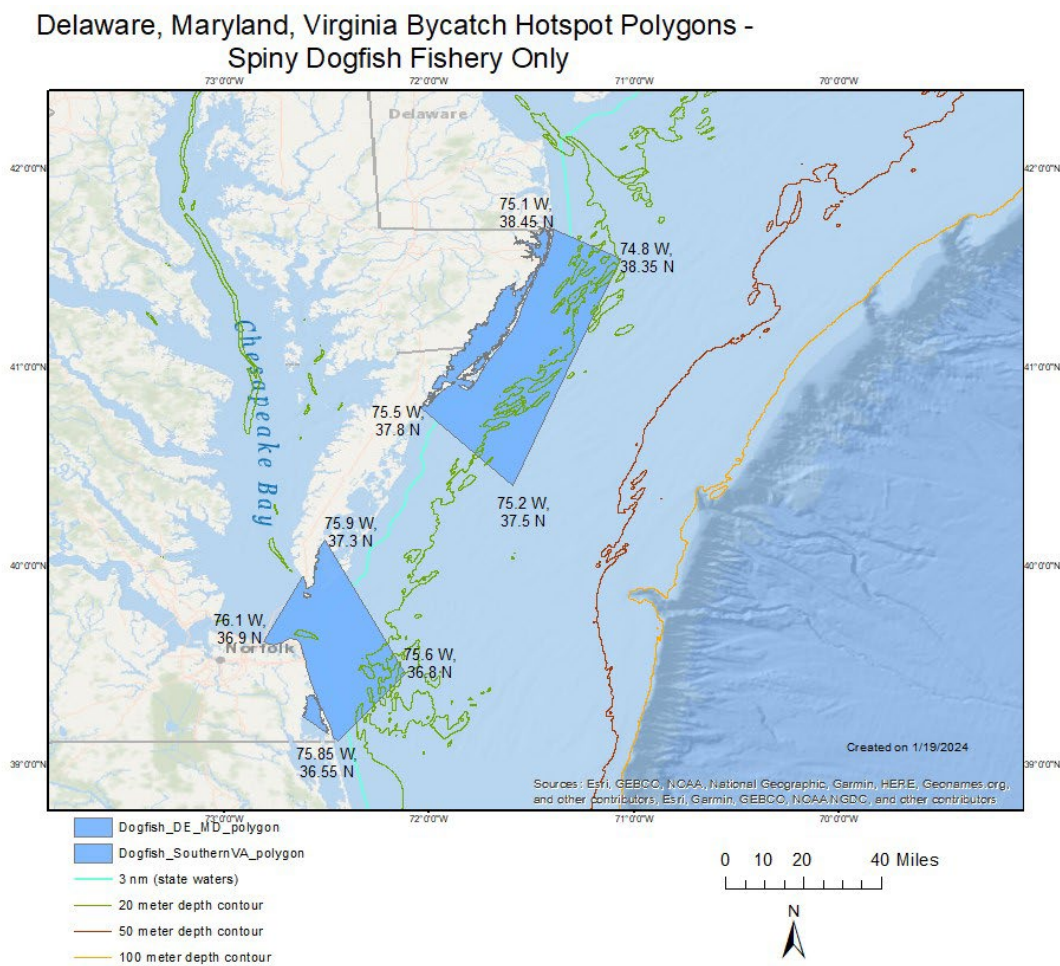
Figure 6. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.

**New Jersey Bycatch Hotspot Polygon - Monkfish Fishery
and Spiny Dogfish Fishery**



Note: The same figures are repeated in each action alternative, so the reader does not have to search for figures in other parts of the document. Accordingly, Figure 6, Figure 9, and Figure 12 are identical.

Figure 7. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.



Note: The same figures are repeated in each action alternative, so the reader does not have to search for figures in other parts of the document. Accordingly, Figure 7, Figure 10, and Figure 13 are identical.

Rationale for specific time/area closures: The time-area closures would likely reduce overall gillnet fishing, thus eliminating some interactions with Atlantic sturgeon (and mortality) by federal fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and spiny dogfish using gillnet gear in federal and state waters. These hotspot area polygons and times in which measures would apply are based on observer data indicating when and where observed sturgeon takes occurred most frequently from 2017-2019 and 2021-2022. If effort shifts to areas with less sturgeon, that would reduce both the number of sturgeon takes and sturgeon mortality. This Most restrictive Alternative facilitates comparing a range of alternatives.

Rationale for specific timing of measures is included as follows for observed gillnet takes on trips targeting monkfish and spiny dogfish from 2017-2019 and 2021-2022. There were 355 observed sturgeon takes for gillnet trips targeting monkfish and spiny dogfish, 175 from the monkfish fishery and 180 from the spiny dogfish fishery. See Section 4.0 for how sturgeon interactions were determined.

- Southern New England monkfish fishery
 - o April had 6 observed sturgeon takes in the SNE polygon, representing ~3% of total observed gillnet takes on trips targeting monkfish from 2017-2019 and 2021-2022. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 2.
 - o May had 31 observed sturgeon takes in the SNE polygon, representing ~18% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 3.
 - o December had 33 observed sturgeon takes in the SNE polygon, representing ~19% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 3.
- New Jersey monkfish fishery
 - o May had 23 observed takes in the NJ polygon, representing ~13% of total observed takes on trips targeting monkfish from 2017-2019 and 2021-2022. Note that there is a closure from the Harbor Porpoise Take Reduction Plan⁴; April 1 – 20 is closed to large mesh 7” + gillnet closure in the Waters off New Jersey management area which overlaps the NJ polygon. Initial feedback from NOAA’s Office of Law Enforcement (OLE) is this 10-day opening between closures does not pose an enforcement issue.
 - o October 15 – December 31 had 29 observed sturgeon takes in the New Jersey polygon, representing ~17% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 3.
 - This time period is conservative for the monkfish fishery given all of the observed takes occurred in December, however, there was a desire to have the time period for the New Jersey polygon to be the same for the monkfish and spiny dogfish fisheries.
- New Jersey spiny dogfish fishery
 - o May had 12 observed sturgeon takes in the NJ polygon, representing ~7% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 5.
 - o October 15 – December 31 had 33 observed takes in the New Jersey polygon, representing ~18% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 2.
- Delaware/Maryland/Virginia spiny dogfish fishery
 - o Across both Mid-Atlantic polygons, November through March had 107 observed takes, representing ~59% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in these two Mid-Atlantic polygons was 9.

Rationale for gear restriction measures:

- Low-profile gillnet gear in the monkfish fishery: Low-profile gillnet gear in the monkfish fishery has been shown to reduce sturgeon bycatch in the New Jersey region based on various studies. More specifically, in the Fox, et al. 2019 study, sturgeon bycatch was reduced by ~76% (by a

⁴ Harbor Porpoise Take Reduction Plan information and a map of the New Jersey April 1-20 large mesh closure can be found here: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/harbor-porpoise-take-reduction-plan>.

ratio of 4.2 to 1) when using the experimental low-profile gillnet gear in the New Jersey region. The authors emphasize that the results are highly uncertain, however. It is also worth noting that this study also evaluated monkfish catch rates with the experimental low-profile gillnet gear and found that vessels fishing off New Jersey had no significant difference in monkfish catch rates, however, vessels fishing off New York caught significantly fewer monkfish. This is the reason why use of low-profile gillnet gear is only being proposed for use by the monkfish fishery in the New Jersey bycatch hotspot polygons and not other regions and not in the spiny dogfish fishery until further research is done.

- In the Fox et al., 2011 study, the researchers tested the influence of tie-downs on sturgeon bycatch using gillnets of standard height (12 meshes high) and found no significant differences in sturgeon bycatch but did find significantly lower target species catches in the gear configuration without tie downs. In the follow-up 2012 study, the researchers tested a low-profile gear configuration with the same tie-down configuration and net height 6 meshes high and found significantly lower sturgeon bycatch in the low-profile nets and lower (though not significant) target species landings (monkfish and winter skate). In their subsequent 2013 study where net height increased from 6 to 8 meshes, the researchers found lower (but not significant) sturgeon bycatch in the low-profile net and similar (not significant) rates of target species landings. Lastly, in the 2019 Fox et al. study where mesh size was increased from 12 to 13 inches and twine size decreased from 0.90 to 0.81mm, the researchers found the low-profile net reduced sturgeon bycatch by a ratio of 4.2 to 1. The lighter twine is intended to reduce retention of larger sturgeon while the larger mesh size allows smaller sturgeon to escape. Results for target species catches were mixed, with the vessel fishing off New York catching significantly fewer monkfish with the low-profile net, while there was no significant difference between monkfish catch by the vessel fishing off New Jersey. The New York based vessel overall had higher monkfish catch rates and longer soak durations, both of which may have contributed to the difference in monkfish catch rates between the experimental low-profile net and the control net. The vessel fishing off New Jersey had more modest monkfish catch rates overall and shorter soak durations (mean soak time of 32.1 hours vs 48 hours for the New York vessel), which may have better optimized the effectiveness of the experimental low-profile net and thus the difference in monkfish catch between the experimental and standard nets was not significant. Catches of winter skate were not significantly different for either vessel. In the He and Jones (2013) study, researchers tested the low-profile net design from the Fox et al. 2013 study off Virginia and Maryland and found sturgeon bycatch was significantly reduced with the low-profile net, though only seven sturgeon were caught in total. Results for target species catches were mixed, with one vessel having no significant difference in monkfish catch while the other vessel had significantly lower monkfish catch with the low-profile net particularly when catch rates are high. There were no significant differences in winter skate catch. All studies had relatively low sample sizes and results are considered uncertain. Table 6 summarizes the gear studies described above.
- Requirement of low-profile gear would be delayed until January 1, 2026, to allow sufficient time for gear manufacturers to produce this gear for the commercial monkfish vessels. The delay will also allow additional time for the Harbor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear which would use 0.81 mm versus 0.90 mm that is currently required for large-mesh gillnets ($\geq 7''$) in the Harbor Porpoise regulations during applicable months (January-April).

Table 6. Gillnet configurations used and sturgeon bycatch and target species catch results in Fox et al. 2011, 2012, 2013, and 2019.

	Mesh Size (in.)	Net Height (# Mesh)	Tie Down Length (ft)	Tie Down Spacing (ft)	Hangin g Ratio	Net Length (ft)	Twine Diameter (mm)	Sturgeon Catch (# individuals)		Target Species Landings (kg)		
Fox et al 2011												
Control	12	12	4	24	0.5	300	0.90	18	Not significantly different	Monkfish 7,306.3	Winter skate 10,048.5	Experimental nets (no tie-downs) significantly reduced catch rates
Experimental 1	12	12	N/A	N/A	0.5	300	0.90	5		Monkfish 3,737.9	Winter skate 1,782.3	
Fox et al 2012												
Control	12	12	4	24	0.5	300	0.90	28	Significantly lower in low-profile nets	Monkfish 4,345	Winter skate 11,921	No significant differences, though overall catch rates lower with low- profile nets
Experimental 1	12	6	2	12	0.5	300	0.90	9		Monkfish 3,341	Winter skate 9,734	
Fox et al 2013												
Control	12	12	4	24	0.5	300	0.90	21	Not significantly different	Monkfish 2,615.5	Winter skate 2,417.6	Similar catch rates, not significantly different
Experimental 1	12	8	2	12	0.5	300	0.90	14		Monkfish 2,388.7	Winter skate 2,103.2	
Fox et al 2019												
Control	12	12	4	24	0.5	300	0.90	25	Significantly lower in low-profile nets	Monkfish * 32,333	Winter skate* 35,010	Monkfish catch significantly lower with low-profile nets for NY, no sig. differences for NJ; no sig. differences in winter skate catch for either
Experimental 1	13	8	2	12	0.5	300	0.81	6				

* Monkfish and winter skate landings were not differentiated between the control and experimental gillnet configurations so only total is included.

4.3 ALTERNATIVE 3 – INTERMEDIATE STURGEON PACKAGE

Under Alternative 3, a subset of the time/area closures and gear restrictions under consideration in Alternative 2 for both the federal monkfish and spiny dogfish gillnet fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas (Figure 5, Figure 6, Figure 7). This alternative is the intermediate alternative under consideration in terms of closures. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) using $\geq 10''$ mesh size and vessels with federal spiny dogfish permits using gillnet gear with mesh size of 5 - $< 10''$. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon to be implemented on January 1, 2026. Additionally, an overnight soak time prohibition from 8pm until 5am (sunrise in Point Pleasant NJ on May 15 is 5:40am) is included for federal vessels targeting spiny dogfish in the New Jersey hotspot polygon in May. The polygons where the closures and gear restrictions would apply are the same for both the monkfish and spiny dogfish fisheries off New Jersey to help simplify the measures and to acknowledge that sturgeon are caught in this area by both fisheries. There are two Delaware/Maryland/Virginia bycatch polygons because of the two concentrations of observed sturgeon takes. The observed sturgeon takes occurred during similar times of the year, thus, the same closure and gear restriction measures would be the same across both polygons. No specific implementation delay was recommended by the Councils for the spiny dogfish measures.

More specifically, Alternative 3 (Intermediate Package) includes the following time/area closures and gear restrictions:

Vessels with a federal fishing permit targeting monkfish in federal and/or state waters

- Closure in Southern New England (SNE) bycatch hotspot polygon (Figure 8) during **May 1 – May 31** and **December 1 – December 31**, two months with the highest observed sturgeon takes.
- Closure in New Jersey bycatch hotspot polygon (Figure 9) during **December 1 – December 31**, the month with the highest observed sturgeon takes.
- Low-profile gillnet gear requirement in New Jersey bycatch hotspot polygon (Figure 9) in the rest of year when above polygon closure not in effect (**January 1 – November 30**).

Vessels with a federal fishing permit targeting spiny dogfish in federal and/or state waters

- Closure in the New Jersey bycatch hotspot polygon (Figure 9) during **November 1 – December 31**, two months with the highest observed sturgeon takes.
- Overnight soak time prohibition from 8pm until 5am in New Jersey bycatch hotspot polygon (Figure 9) during **May 1 – May 31**.
- Closure in the Delaware/Maryland/Virginia bycatch hotspot polygons (Figure 10) during **December 1 – February 28**, three consecutive months with the highest observed sturgeon takes.

Note, time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal fishing permit. Atlantic States Marine Fisheries Commission (ASMFC) is expected to take complementary action to reduce sturgeon interactions by state vessels in state waters.

Figure 8. Southern New England sturgeon polygon applicable only to the federal monkfish fishery.

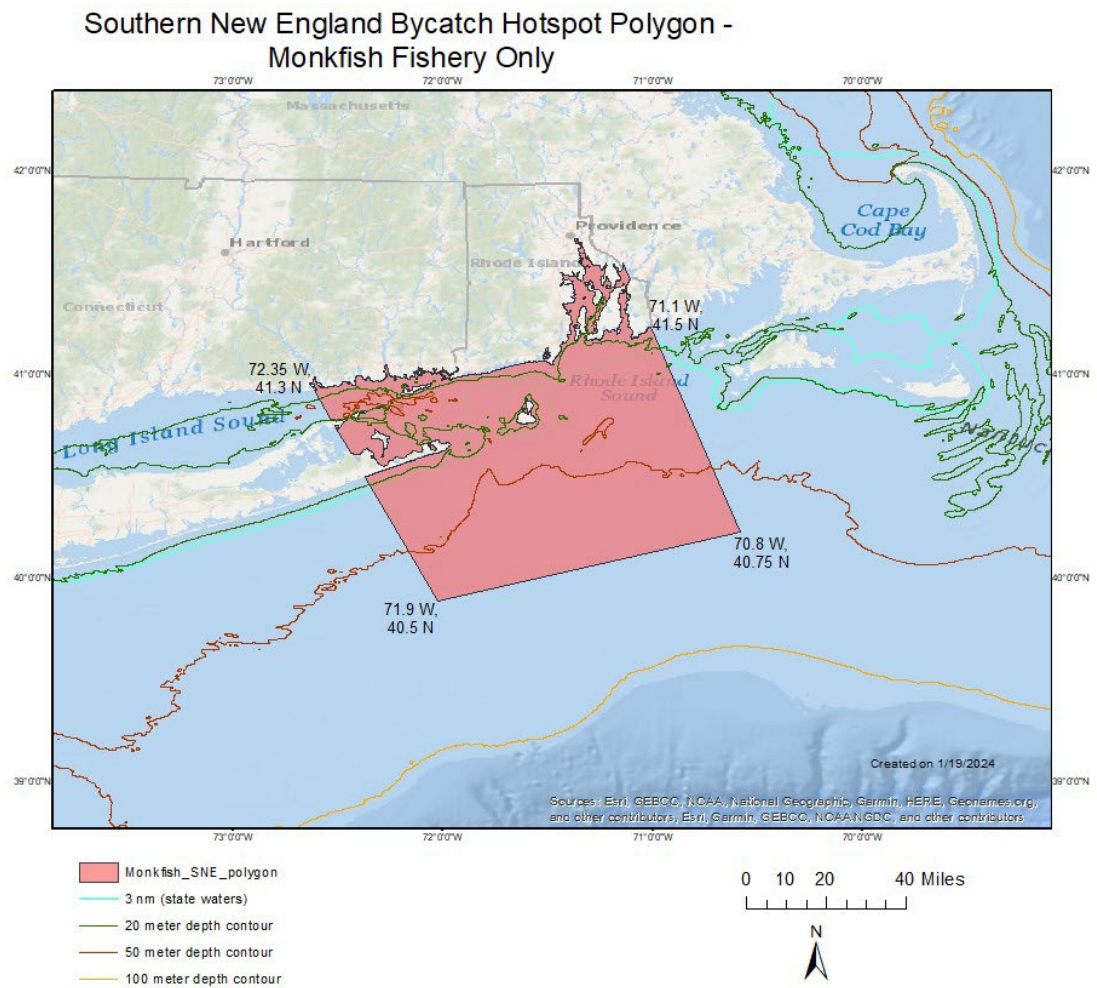


Figure 9. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.

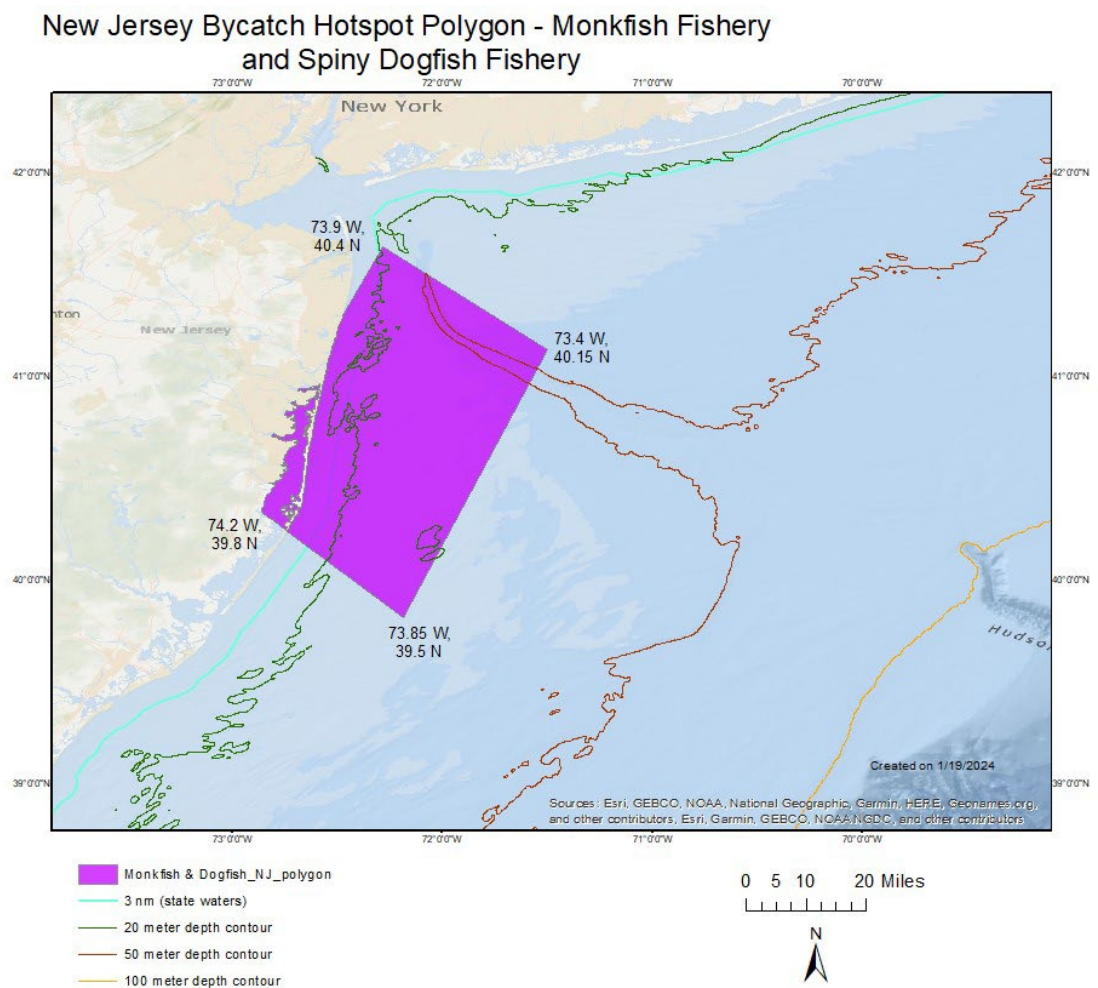
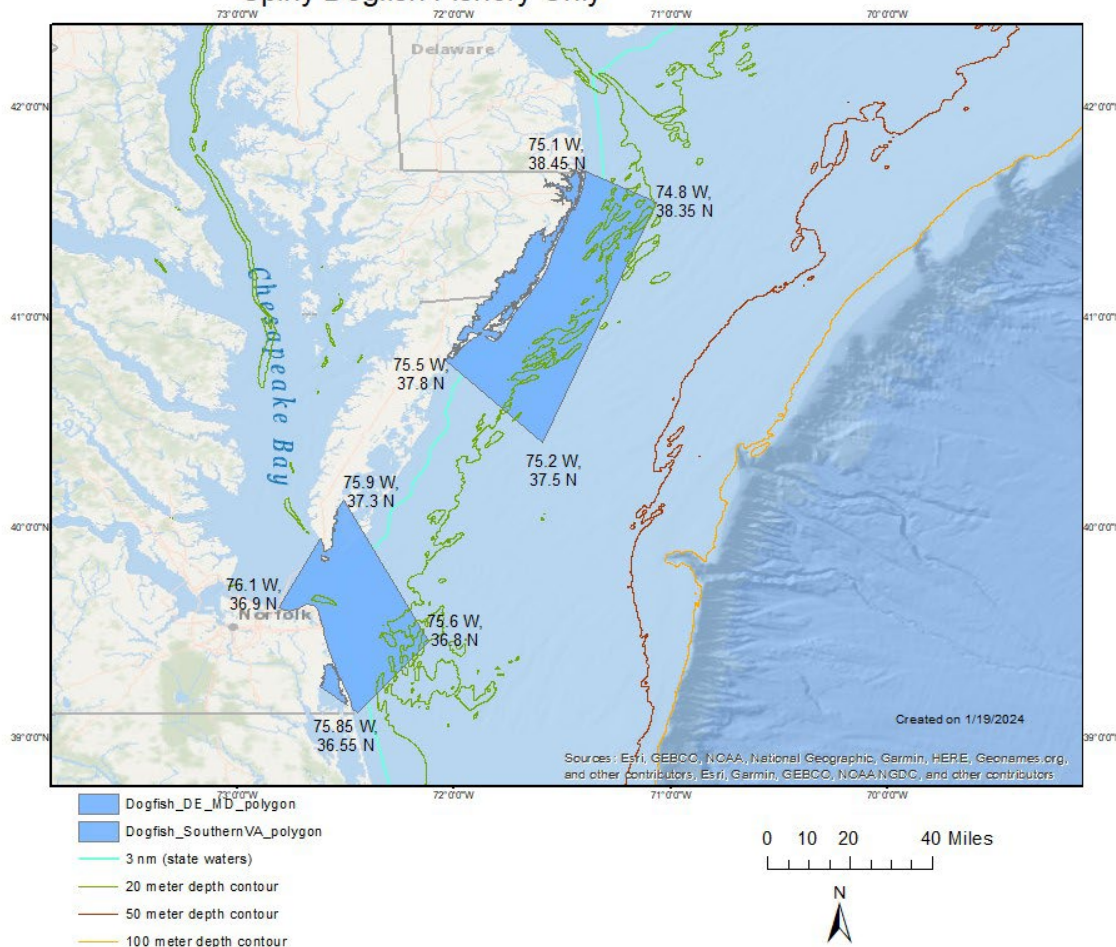


Figure 10. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.

**Delaware, Maryland, Virginia Bycatch Hotspot Polygons -
Spiny Dogfish Fishery Only**



Rationale for specific time/area closures: The time-area closures would likely reduce overall gillnet fishing, thus eliminating some interactions with Atlantic sturgeon (and mortality) by federal fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and spiny dogfish using gillnet gear in federal and state waters. These hotspot area polygons and times in which measures would apply are based on observer data indicating when and where observed sturgeon takes occurred most frequently from 2017-2019 and 2021-2022. If effort shifts to areas with less sturgeon, that would also reduce takes/mortality. This Intermediate Alternative facilitates comparing a range of alternatives.

Rationale for specific timing of measures are included as follows for observed gillnet takes on trips targeting monkfish and spiny dogfish from 2017-2019 and 2021-2022. There were 355 observed sturgeon takes for gillnet trips targeting monkfish and spiny dogfish, 175 from the monkfish fishery and 180 from the spiny dogfish fishery. See Section 4.0 for how sturgeon interactions were determined.

- Southern New England monkfish fishery
 - o May had 31 sturgeon takes in the SNE polygon, representing ~18% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 3.

- December had 33 sturgeon takes in the SNE polygon, representing ~19% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 3.
- New Jersey monkfish fishery
 - December had 29 observed sturgeon takes in the NJ polygon, representing ~17% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 3.
- New Jersey spiny dogfish fishery
 - May had 12 observed sturgeon takes in the NJ polygon, representing ~7% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 5.
 - November through December has 29 observed sturgeon takes in the NJ polygon, representing 16% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 2.
- Delaware/Maryland/Virginia spiny dogfish fishery
 - Across both polygons, December through February has 79 observed takes, representing 44% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in these two Mid-Atlantic polygons was 9.

Rationale for gear restriction measures:

- Low-profile gillnet gear in the monkfish fishery: Low-profile gillnet gear in the monkfish fishery has been shown to reduce sturgeon bycatch in the New Jersey region based on various studies. More specifically, in the Fox, et al. 2019 study, sturgeon bycatch was reduced by ~76% (by a ratio of 4.2 to 1) when using the experimental low-profile gillnet gear in the New Jersey region. The authors emphasize that the results are highly uncertain, however. It is also worth noting that this study also evaluated monkfish catch rates with the experimental low-profile gillnet gear and found that vessels fishing out of New Jersey had no significant difference in monkfish catch rates, however, vessels fishing out of New York caught significantly fewer monkfish. This is the reason why use of low-profile gillnet gear is only being proposed for use by the monkfish fishery in the New Jersey bycatch hotspot polygons and not other regions and not in the spiny dogfish fishery until further research is done.

Table 6 summarizes the gear studies. See Alternative 2 for additional detail.

- Requirement of low-profile gear would be delayed until January 1, 2026, to allow sufficient time for gear manufacturers to produce this gear for the commercial monkfish vessels. The delay will also allow additional time for the Harbor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear which would use 0.81 mm versus 0.90 mm that is currently required for large-mesh gillnets ($\geq 7''$) in the Harbor Porpoise regulations during applicable months (January-April).
- Overnight soak time prohibition from 8pm until 5am in the spiny dogfish fishery, defined as vessels with a spiny dogfish permit using gillnet gear with mesh between 5'' - <10'' (e.g., would not apply to the monkfish fishery which has a minimum mesh size of 10'' until May 1, 2025, at which time the minimum mesh size is increased to 12''); Soak time limits may be feasible for the spiny dogfish fishery, which may vary by fisherman and region. Restricting soak times overnight is more enforceable compared to limiting spiny dogfish fishing to 24 hours or greater. The soak time restrictions are during times of documented high sturgeon bycatch as described above for

closures. The soak time restrictions reduce takes by reducing the time gear is in the water and should also reduce mortality, which increases when gear is unchecked for more than 14 hours at 15 degrees Celsius (59 Fahrenheit) (Kahn and Mohead 2010). Effectively requiring vessels to remove gear each day could have vessel safety issues in times of severe weather.

4.4 ALTERNATIVE 4 – LESS RESTRICTIVE STURGEON PACKAGE (LEAST TIME/AREA CLOSURES AND GEAR RESTRICTIONS)

Under Alternative 4, only the most targeted time/area closures and gear restrictions under consideration for both the federal monkfish and spiny dogfish gillnet fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas (Figure 5, Figure 6, Figure 7). This alternative has the fewest measures, based on times where observed sturgeon bycatch is the highest. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) using $\geq 10''$ mesh size and vessels with federal spiny dogfish permits using gillnet gear with mesh size of 5 - $< 10''$. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon to be implemented on January 1, 2026. Additionally, an overnight soak time prohibition from 8pm until 5am (sunrise in Point Pleasant NJ on May 15 is 5:40am) is included for federal vessels targeting spiny dogfish in the New Jersey hotspot polygon in May. The polygons where the closures and gear restrictions would apply are the same for both the monkfish and spiny dogfish fisheries off New Jersey to help simplify the measures and to acknowledge that sturgeon are caught in this area by both fisheries. There are two Delaware/Maryland/Virginia bycatch polygons because of the two concentrations of observed sturgeon takes. The observed sturgeon takes occurred during similar times of the year, thus, the same closure and gear restriction measures would be the same across both polygons. No specific implementation delay was recommended by the Councils for the spiny dogfish measures.

More specifically, Alternative 4 includes the following time/area closures and gear restrictions:

Vessels with a federal fishing permit targeting monkfish in federal and/or state waters

- Closure in Southern New England (SNE) bycatch hotspot polygon (Figure 11) during **December 1 – December 31**, the month with the highest observed sturgeon takes.
- Closure in New Jersey bycatch hotspot polygon (Figure 12) during **November 1 – November 30**.
 - o Note, if the Councils do not select the option to require low-profile gillnet gear in the New Jersey hotspot in the month of December (month with the highest observed takes), then this closure should be in December instead of November.
- Low-profile gillnet gear requirement in New Jersey bycatch hotspot polygon (Figure 12) during **December 1 – December 31**.

Vessels with a federal fishing permit targeting spiny dogfish in federal and/or state waters

- Closure in New Jersey bycatch hotspot polygon (Figure 12) during **November 1 – November 30**.
- Overnight soak time prohibition from 8pm until 5am in New Jersey bycatch hotspot polygon (Figure 12) during **December 1 – December 31** and **May 1 – May 31**.
- Closure in the Delaware/Maryland/Virginia bycatch hotspot polygons (Figure 13) during **December 1 – January 31**, two consecutive months with the highest observed sturgeon takes.

Note, time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal fishing permit. Atlantic States Marine

Fisheries Commission (ASMFC) is expected to take complementary action to reduce sturgeon interactions by state vessels in state waters.

Figure 11. Southern New England sturgeon polygon applicable only to the federal monkfish fishery.

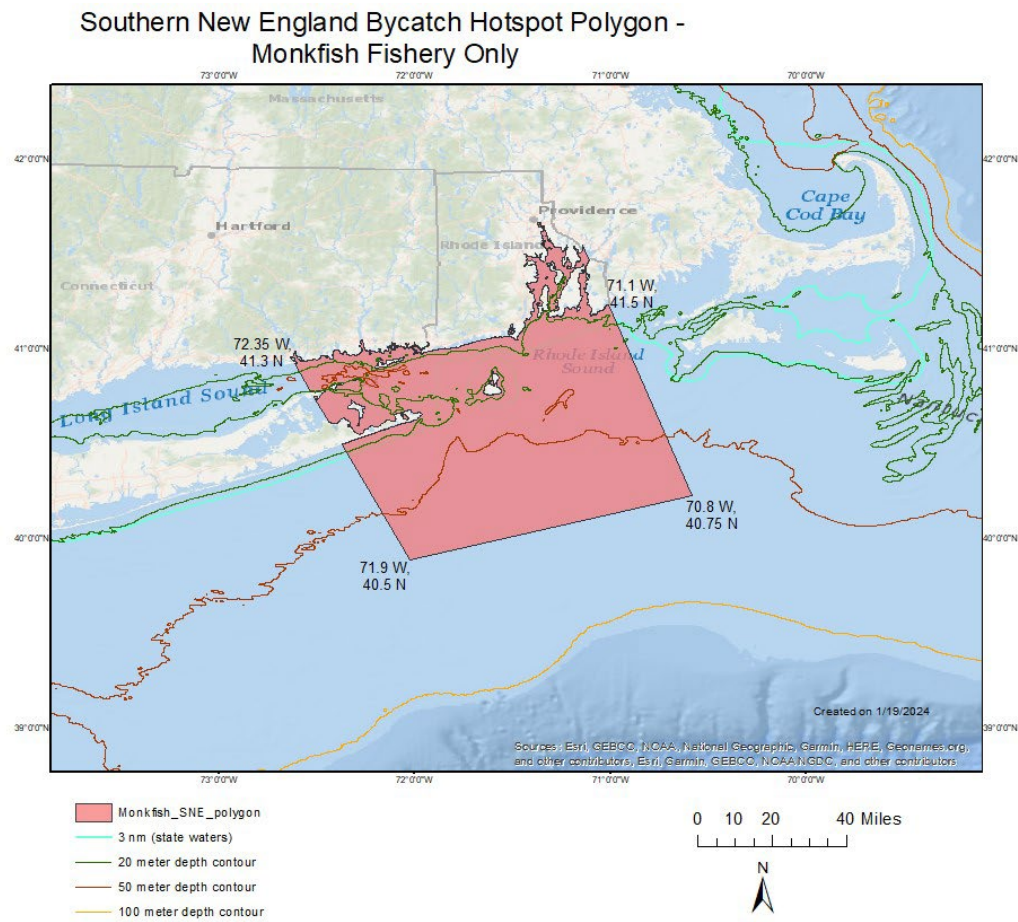


Figure 12. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.

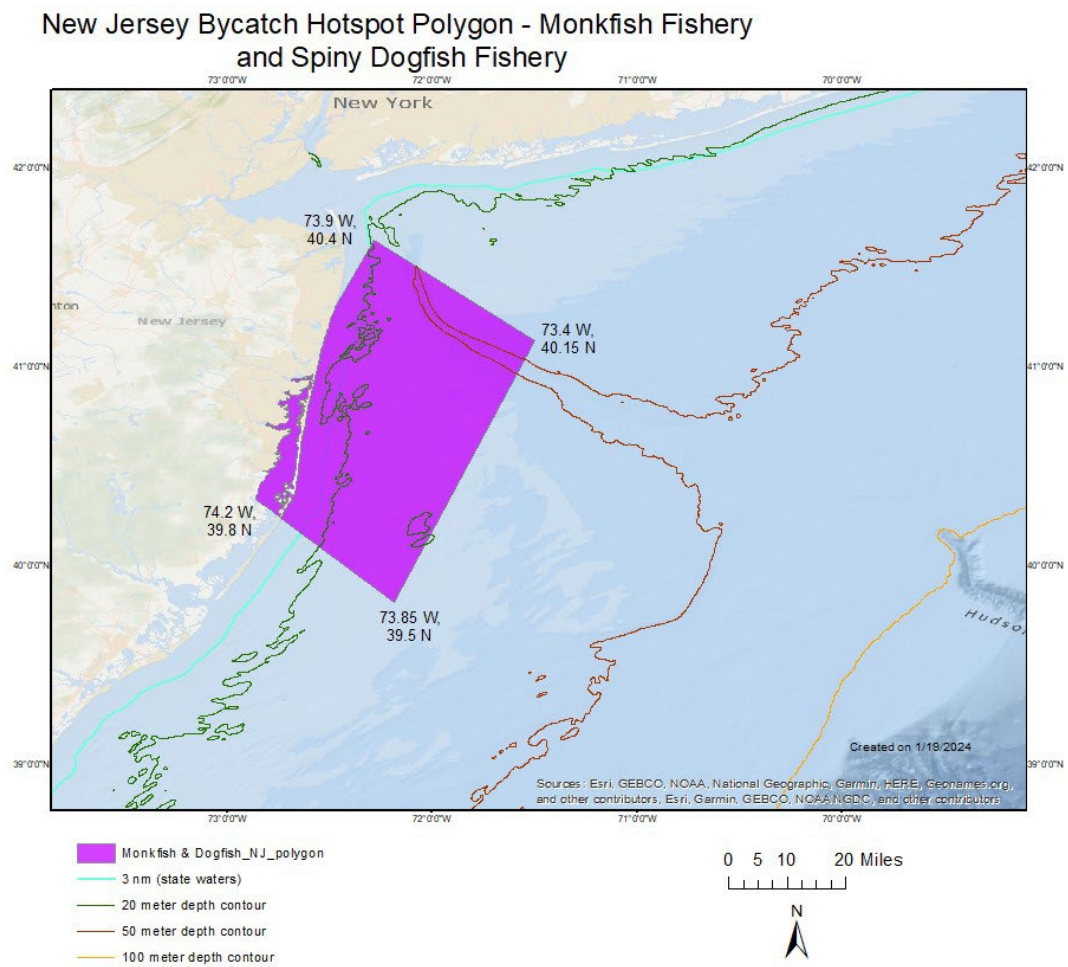
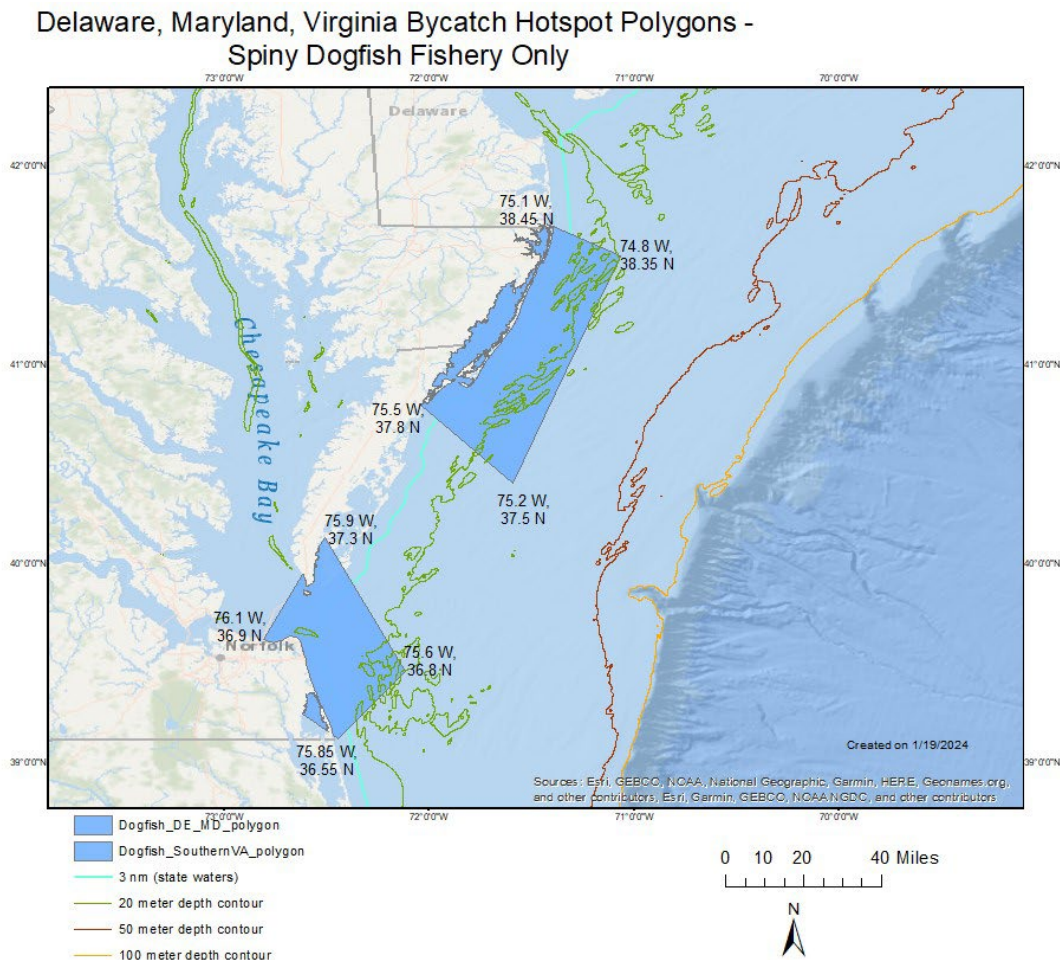


Figure 13. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.



Rationale for specific time/area closures: The time-area closures would likely reduce overall gillnet fishing, thus eliminating some interactions with Atlantic sturgeon (and mortality) by federal fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and spiny dogfish using gillnet gear in federal and state waters. These hotspot area polygons and times in which measures would apply are based on observer data indicating when and where observed sturgeon takes occurred most frequently from 2017-2019 and 2021-2022. If effort shifts to areas with less sturgeon, that would also reduce both sturgeon takes and mortality. This Less restrictive Alternative facilitates comparing a range of alternatives.

Rationale for specific timing of measures are included as follows for observed gillnet takes on trips targeting monkfish and spiny dogfish from 2017-2019 and 2021-2022. There were 355 observed sturgeon takes for gillnet trips targeting monkfish and spiny dogfish, 175 from the monkfish fishery and 180 from the spiny dogfish fishery. See Section 4.0 for how sturgeon interactions were determined.

- Southern New England monkfish fishery
 - o December had 33 observed sturgeon takes in the SNE polygon, representing ~19% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 3.

- New Jersey monkfish fishery
 - o November did not have any sturgeon takes in the NJ polygon in the monkfish fishery, however, there were substantial observed sturgeon takes in the spiny dogfish fishery in this area during the same time period so there was interest in aligning these time/area measures for both fisheries.
 - o December had 29 observed sturgeon takes in the NJ polygon, representing ~17% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 3.
- New Jersey spiny dogfish fishery
 - o May had 12 observed sturgeon takes in the NJ polygon, representing ~7% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single haul in the NJ polygon was 5.
 - o November through December has 29 observed sturgeon takes in the NJ polygon, representing 16% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 2. The number of sturgeon takes for each of these months cannot be shared due to data confidentiality reasons, though it is worth noting that December represents <1% of total observed gillnet takes on trips targeting spiny dogfish.
- Delaware/Maryland/Virginia spiny dogfish fishery
 - o Across both polygons, December through January had 69 sturgeon, representing ~38% of observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in these two Mid-Atlantic polygons was 9.

Rationale for gear restriction measures:

- Low-profile gillnet gear in the monkfish fishery: Low-profile gillnet gear in the monkfish fishery has been shown to reduce sturgeon bycatch in the New Jersey region based on various studies. More specifically, in the Fox, et al. 2019 study, sturgeon bycatch was reduced by ~76% (by a ratio of 4.2 to 1) when using the experimental low-profile gillnet gear in the New Jersey region. The authors emphasize that the results are highly uncertain, however. It is also worth noting that this study also evaluated monkfish catch rates with the experimental low-profile gillnet gear and found that vessels fishing out of New Jersey had no significant difference in monkfish catch rates, however, vessels fishing out of New York caught significantly fewer monkfish. This is the reason why use of low-profile gillnet gear is only being proposed for use by the monkfish fishery in the New Jersey bycatch hotspot polygons and not other regions and not in the spiny dogfish fishery until further research is done.

Table 6 summarizes the gear studies. See Alternative 2 for additional detail.

- Requirement of low-profile gear would be delayed until January 1, 2026, to allow sufficient time for gear manufacturers to produce this gear for the commercial monkfish vessels. The delay will also allow additional time for the Harbor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear which would use 0.81 mm versus 0.90 mm that is currently required for large-mesh gillnets ($\geq 7''$) in the Harbor Porpoise regulations during applicable months (January-April).
- Overnight soak time prohibition from 8pm until 5am in the spiny dogfish fishery, defined as vessels with a spiny dogfish permit using gillnet gear with mesh between 5'' - <10'' (e.g., would not apply to the monkfish fishery which has a minimum mesh size of 10'' until May 1, 2025, at which time the minimum mesh size is increased to 12''): Soak time limits may be feasible for the spiny dogfish fishery, which may vary by fisherman and region. Restricting soak times overnight

is more enforceable compared to limiting spiny dogfish fishing to 24 hours or greater. The soak time restrictions are during times of documented high sturgeon bycatch as described above for closures. The soak time restrictions reduce takes by reducing the time gear is in the water and should also reduce mortality, which increases when gear is unchecked for more than 14 hours at 15 degrees Celsius (59 Fahrenheit) (Kahn and Mohead 2010). Effectively requiring vessels to remove gear each day could have vessel safety issues in times of severe weather.

4.5 ALTERNATIVE 5 – GEAR-ONLY STURGEON PACKAGE (PREFERRED ALTERNATIVE)

Under Alternative 5, there would be gear restrictions for both the federal monkfish and spiny dogfish gillnet fisheries in several Atlantic sturgeon bycatch hotspot areas (Figure 14 and Figure 15). The gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) using $\geq 10''$ mesh size and vessels with federal spiny dogfish permits using gillnet gear with mesh size of 5 - $< 10''$. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon to be implemented on January 1, 2026. Additionally, an overnight soak time prohibition from 8pm until 5am (sunrise in Point Pleasant NJ on May 15 is 5:40 am) is included for federal vessels targeting spiny dogfish in the New Jersey and the two more southern Mid-Atlantic polygons. The Councils considered two optional sub-alternatives for vessels using $< 5.25''$ gillnet mesh that would be exempt from the overnight soak prohibition in NJ polygon and DE/MD/VA polygon, sub-alternatives 5a and 5b, respectively (only 5b was adopted as preferred). The polygons where the gear restrictions would apply are the same for both the monkfish and spiny dogfish fisheries off New Jersey to help simplify the measures and to acknowledge that sturgeon are caught in this area by both fisheries. There are two Delaware/Maryland/Virginia bycatch polygons because of the two concentrations of observed sturgeon takes. The observed sturgeon takes occurred during similar times of the year, thus, the same gear restriction measures would be the same across both polygons. No specific implementation delay was recommended by the Councils for the spiny dogfish measures.

More specifically, Alternative 5 includes the following time/area closures and gear restrictions:

Vessels with a federal fishing permit targeting monkfish in federal and/or state waters

- Low-profile gillnet gear requirement in New Jersey bycatch hotspot polygon (Figure 14), **Year-round.**

Vessels with a federal fishing permit targeting spiny dogfish in federal and/or state waters

- Overnight soak time prohibition from 8pm until 5am in the New Jersey bycatch hotspot polygon (Figure 14) during **May 1 – May 31** and **November 1 – November 30.**
- Overnight soak time prohibition from 8pm until 5am in the Delaware/Maryland/Virginia bycatch hotspot polygons (Figure 15) during **November 1 – March 31.**

Sub-alternative 5a: Vessels using less than 5 ¼ inch gillnet mesh would be exempted from the New Jersey polygon overnight soak time prohibition.

Sub-alternative 5b (preferred): Vessels using less than 5 ¼ inch gillnet mesh would be exempted from the Delaware/Maryland/Virginia polygon overnight soak time prohibition.

These gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal fishing permit. Atlantic States Marine Fisheries Commission (ASMFC) is expected to take complementary action to reduce sturgeon interactions by state vessels in state waters.

Figure 14. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.

**New Jersey Bycatch Hotspot Polygon - Monkfish Fishery
and Spiny Dogfish Fishery**

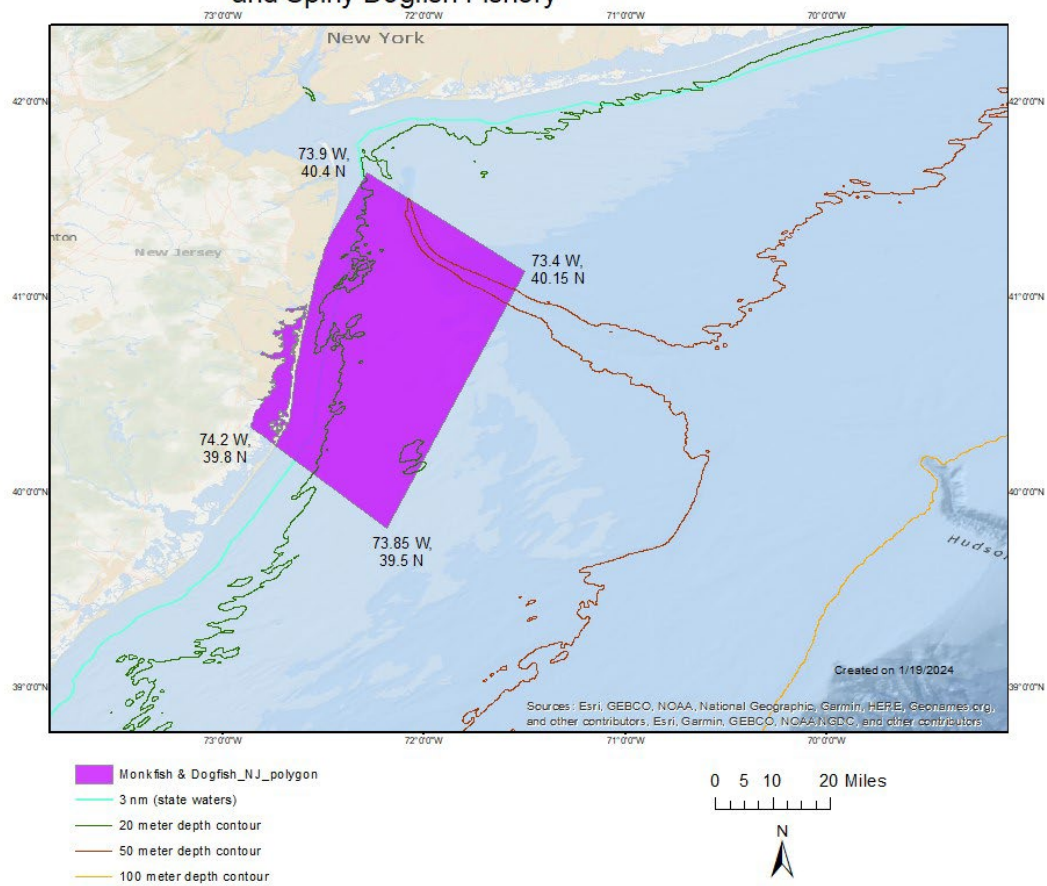
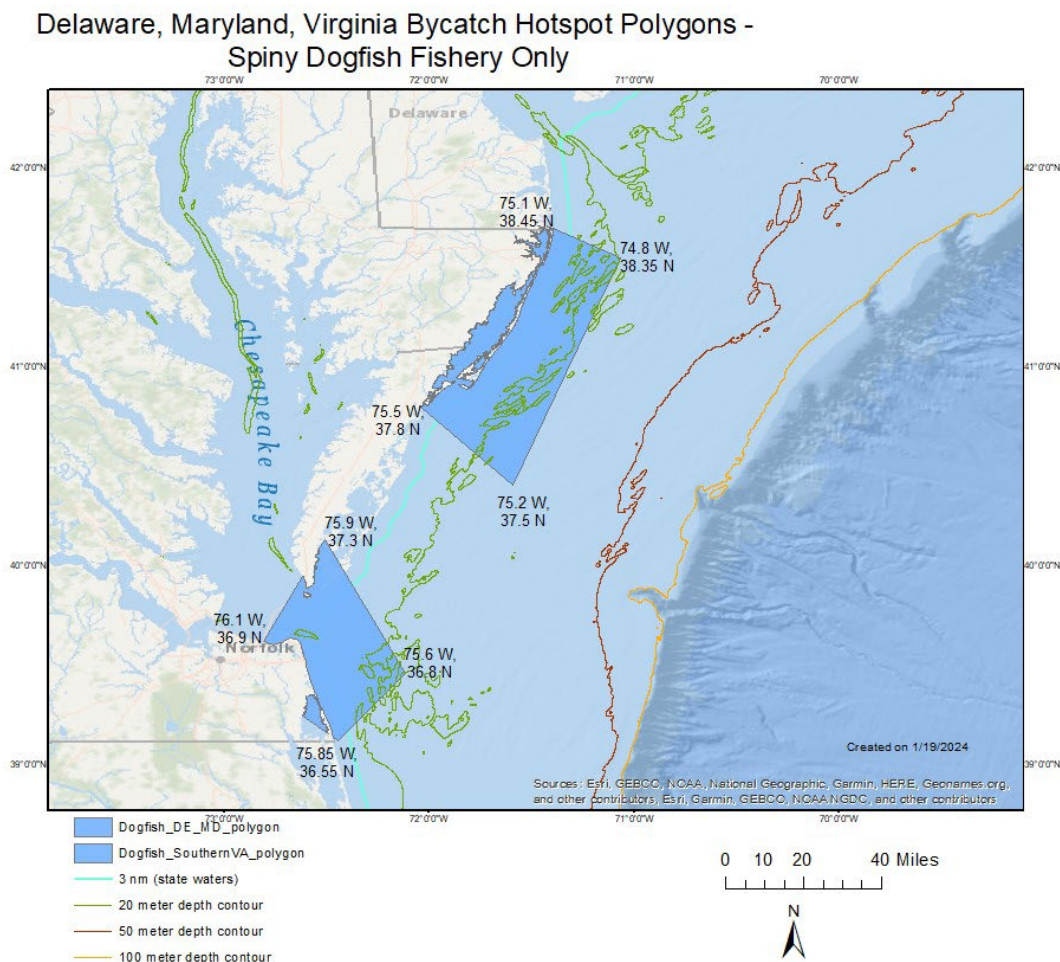


Figure 15. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.



Rationale for specific time periods: The time periods in which gear restrictions would apply are based on reducing interactions with Atlantic sturgeon by federal fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and spiny dogfish using gillnet gear in federal and state waters in the bycatch hotspot areas. These hotspot area polygons and times in which measures would apply were based on observer data including when and where observed sturgeon takes for federal gillnet vessels targeting monkfish and spiny dogfish occurred from 2017-2019 and 2021-2022. There were 355 observed sturgeon takes for gillnet trips targeting monkfish and spiny dogfish, 175 from the monkfish fishery and 180 from the spiny dogfish fishery. See Section 4.0 for how sturgeon interactions were determined.

- New Jersey spiny dogfish fishery
 - May had 12 observed sturgeon takes in the NJ polygon, representing ~7% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 5.
 - November had 28 observed sturgeon takes in the NJ polygon, representing ~16% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 2.
- Delaware/Maryland/Virginia spiny dogfish fishery
 - Across both polygons, November through March had 107, representing ~59% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in these two Mid-Atlantic polygons was 9.

Rationale for gear restriction measures:

- Low-profile gillnet gear in the monkfish fishery: Low-profile gillnet gear in the monkfish fishery has been shown to reduce sturgeon bycatch in the New Jersey region based on various studies. More specifically, in the Fox, et al. 2019 study, sturgeon bycatch was reduced by ~76% (by a ratio of 4.2 to 1) when using the experimental low-profile gillnet gear in the New Jersey region. The authors emphasize that the results are highly uncertain, however. It is also worth noting that this study also evaluated monkfish catch rates with the experimental low-profile gillnet gear and found that vessels fishing out of New Jersey had no significant difference in monkfish catch rates, however, vessels fishing out of New York caught significantly fewer monkfish. This is the reason why use of low-profile gillnet gear is only being proposed for use by the monkfish fishery in the New Jersey bycatch hotspot polygons and not other regions and not in the spiny dogfish fishery until further research is done.

Table 6 summarizes the gear studies. See Alternative 2 for additional detail.

- Requirement of low-profile gear would be delayed until January 1, 2026, to allow sufficient time for gear manufacturers to produce this gear for the commercial monkfish vessels. The delay will also allow additional time for the Harbor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear which would use 0.81 mm versus 0.90 mm that is currently required for large-mesh gillnets ($\geq 7''$) in the Harbor Porpoise regulations during applicable months (January-April).
- Overnight soak time prohibition from 8pm until 5am in the spiny dogfish fishery, defined as vessels with a spiny dogfish permit using gillnet gear with mesh between 5'' - <10'' (e.g., would not apply to the monkfish fishery which has a minimum mesh size of 10'' until May 1, 2025, at which time the minimum mesh size is increased to 12''): Soak time limits may be feasible for the spiny dogfish fishery, which may vary by fisherman and region. Restricting soak times overnight is more enforceable compared to limiting spiny dogfish fishing to 24 hours or greater. The soak time restrictions reduce takes by reducing the time gear is in the water and should also reduce mortality, which increases when gear is unchecked for more than 14 hours at 15 degrees Celsius (59 Fahrenheit) (Kahn and Mohead 2010). Forcing vessels to remove gear each day could have vessel safety issues in times of severe weather.

Rationale for small-mesh exemptions for overnight soak time prohibition:

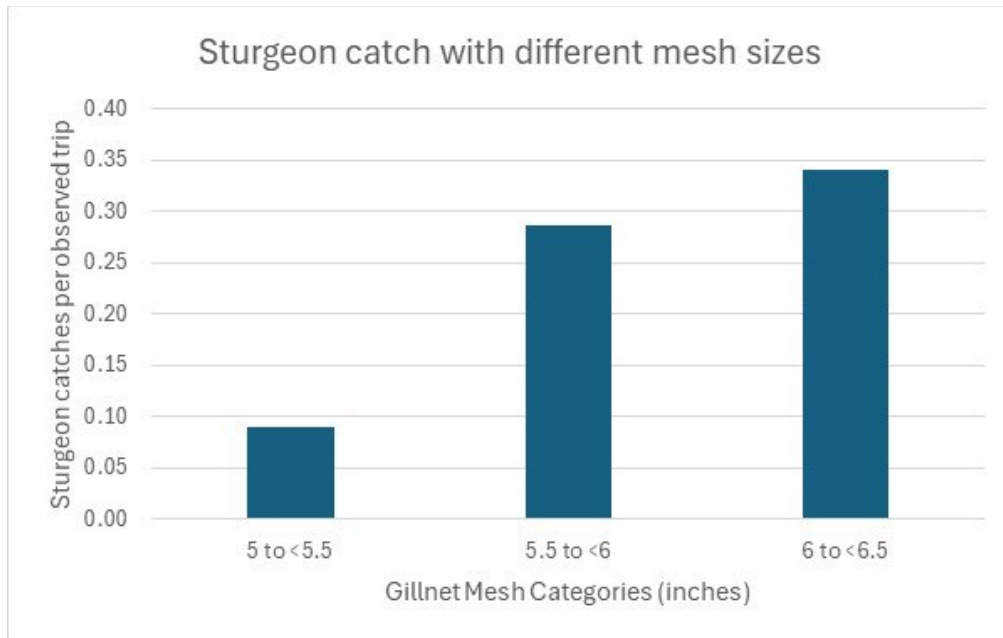
The exemptions were considered to mitigate impacts on fishery participants if sturgeon interactions could still be reduced.

Regarding sub-alternative 5b, analyses of observer data indicate that fishing for spiny dogfish south of 38.8 N latitude (approximate latitude of Lewes/Cape Henlopen, DE) with mesh of 5'' has lower sturgeon take rates based on observer data (Table 7, Figure 16). Most of the VTR landings for the 5'' to <5.5'' mesh bin appears to have been with mesh of 5'', supporting a measure that exempted mesh less than 5.25 inches (note the higher rate on the next larger mesh bin). Monthly analyses indicated for these same trips, December had the highest overall sturgeon catch rate (https://d23h0vhsm26o6d.cloudfront.net/10.-FMAT-PDT-Supplemental_20240312.pdf). There were insufficient data to determine whether the same apparent trends were also indicated for the NJ areas.

Table 7. Takes by mesh size categories in Delmarva Area 2017-2019 and 2021-2022 south of 38.8 N Lat.

Mesh Category (inches)	Sturgeon catches (#)	Observed trips (#)	Sturgeon catch per observer trip
5 to < 5.5"	25	278	0.09
5.5 to < 6"	41	143	0.29
6 to < 6.5"	58	170	0.34

Figure 16. Sturgeon take rates by mesh size categories in Delmarva Area 2017-2019 and 2021-2022 south of 38.8 N Lat.



4.6 ALTERNATIVES CONSIDERED BUT REJECTED

4.6.1 Adding an option to use Vessel Monitoring System (VMS)

The Councils considered using VMS as an enforcement / management tool as part of the range of the monkfish and spiny dogfish alternatives to make soak time restrictions and area closures more enforceable. Currently, VMS is not a requirement in the monkfish and spiny dogfish fisheries, however, this was discussed during Framework 13 development for the monkfish fishery in 2022. During the Joint Monkfish and Dogfish Committee meeting, invited enforcement representatives clarified that VMS is not required to enforce time/area closures, though is still helpful to identify the fishery declaration and vessel location. The Coast Guard uses routine patrols in aircraft and cutters and can do targeted boardings if there are known restrictions in the area regardless of whether a vessel has VMS or not. There was general concern for the impacts of any VMS requirement for these fisheries given the added cost, quota reductions, processor limitations, etc. As part of its priority list for work to be potentially done in 2024, the NEFMC decided instead to add “review of the utility of VMS and how it is used for enforcement in coordination with the MAFMC” given the broader implications for requiring VMS in other fisheries beyond monkfish and spiny dogfish.

4.6.2 Soak time restrictions of 24 hours or greater in the monkfish and spiny dogfish fisheries

The Councils considered restricting soak time limits of 24 hours or greater for the monkfish and spiny dogfish fisheries, however, the options were removed from further consideration given these restrictions do not necessarily reduce sturgeon interactions/bycatch and there are enforcement concerns.

4.6.3 Soak time and low-profile gear restrictions and closures by entire statistical area approach

The Councils considered applying gear restrictions (soak time limits and low-profile gillnet gear) and closures by entire statistical area, however, these are broad areas that are well outside of sturgeon bycatch hotspots and are likely to cause substantial impacts to fishermen.

4.6.4 Shorter increments of time/area closures and additional partial-year gear restriction time periods

Shorter, weekly increments of time/area closures and additional partial-year gear restriction time periods were considered to allow for various combinations of shorter time periods across areas and fisheries, but after initial analysis, these measures were ultimately removed from further consideration. This is because these shorter temporal measures were not likely to achieve the sturgeon bycatch reduction targets identified by GARFO’s Protected Resource Division in a December 4, 2023 memo addressed to the Sturgeon Bycatch FMAT/PDT. Furthermore, the available data did not support an analysis to that level of temporal and spatial resolution without confidentiality issues. The refined range of alternatives in Section 4.0 is a more simplified version that captures the full range of possible time/area closures and gear restriction measures.

5.0 AFFECTED ENVIRONMENT

The Affected Environment is described in this action based on valued ecosystem components (VECs), including target species, non-target species, physical environment and Essential Fish Habitat (EFH), protected resources, and human communities. VECs represent the resources, areas and human communities that may be affected by the alternatives under consideration in this amendment. VECs are the focus since they are the “place” where the impacts of management actions occur.

5.1 TARGET SPECIES

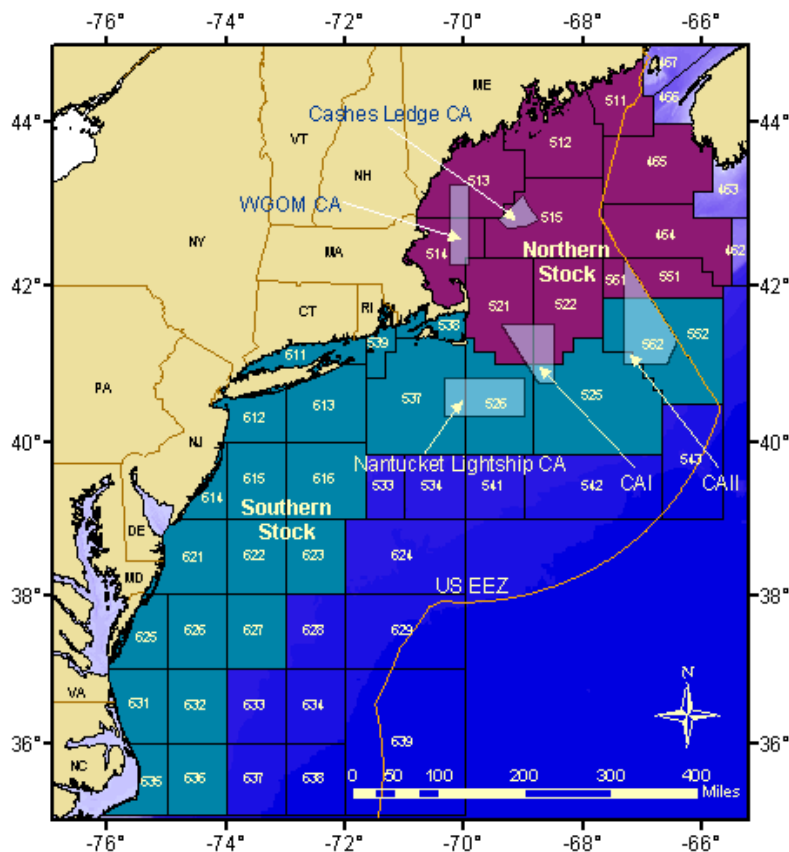
MONKFISH

Monkfish Management: The monkfish fishery in U.S. waters is jointly managed under the Monkfish Fishery Management Plan (FMP) by the New England Fishery Management Council (NEFMC) and the Mid-Atlantic Fishery Management Council (MAFMC), with the NEFMC having the administrative lead. The fishery extends from Maine to North Carolina out to the continental shelf margin. The fishery is assessed and managed in two areas, northern and southern (Map 1). The Northern Fishery Management Area (NFMA) covers the Gulf of Maine (GOM) and northern part of Georges Bank (GB), and the Southern Fishery Management Area (SFMA) extends from the southern flank of GB through the Mid-Atlantic Bight to North Carolina. The directed monkfish fishery is primarily managed with a yearly allocation of monkfish Days-at-Sea (DAS) and possession limits, though incidental landings are allowed in other fisheries.

Monkfish Distribution and Life History. Monkfish (*Lophius americanus*), also called goosfish, occur in the Northwest Atlantic Ocean from the Grand Banks and northern Gulf of St. Lawrence south to Cape Hatteras, North Carolina (Collette & Klein-MacPhee 2002). Data from resource surveys spanning the period 1948-2007 suggest that seasonal onshore-offshore migrations occur (from inshore areas in autumn to depths of at least 900 m in mid-spring) and appear to be related to spawning and possibly food availability (Richards *et al.* 2008). Stock structure is not well understood, but two assessment and management areas for monkfish, northern and southern, were defined in 1999 through the original Fishery Management Plan based on patterns of recruitment and growth and differences in how the fisheries are prosecuted (NEFSC 2020b).

Map 1. Fishery statistical areas used to define the Monkfish NFMA and SFMA.

Source: NEFSC (2020b).



Monkfish Stock Status. The status of the monkfish stocks changed in 2023 to unknown from not subject to overfishing and not overfished, based on the 2022 monkfish stock assessment. These changes were made because the 2013 assessment that supported the prior stock status determinations was rejected during the 2016 assessment due to an invalid ageing method. Analytical assessments have not been used for monkfish since 2013, and index-based approaches have been used since to determine catch advice. A brief history of recent assessments is provided.

The monkfish stock assessment in 2010 (SARC 50) was an analytical assessment that used the SCALE model (had been in use since 2007), concluding that monkfish was not overfished and overfishing was not occurring but recognized significant uncertainty in this determination. The 2013 operational assessment also used the SCALE model and reached the same conclusion.

The 2016 operational assessment, that informed FY 2017-2019 specifications, did not update the SCALE model because its use was invalidated by age validation research (Richards 2016). This assessment concluded that many of the biological reference points were no longer relevant due to invalidation of the growth model (e.g., no estimation of absolute biomass, F_{max} could not be recalculated), and thus were not updated. Stock status was concluded to be unknown. A strong 2015-year class was identified in both the survey and the discard data. The assessment review panel concluded that using a survey index-based method for developing catch advice was appropriate. A method now called the “Ismooth” approach was used that set catch advice based on the recent trend in NEFSC trawl survey indices. This method calculates the proportional rate of change in a smoothed average of the fall and spring NEFSC surveys over the most recent three years. This rate is the slope of the regression trend from the last three years,

which is then multiplied by the most recent three years average of fishery catch to determine catch advice. The multipliers were 1.02 in the NFMA and 0.87 in the SFMA (Table 8):

$$\text{Equation 1: } \text{catch advice} = \text{Trawl survey multiplier} * \text{latest 3-year average catch} = ABC$$

The 2019 assessment continued use of the Ismooth method due to ongoing uncertainties. The assessment continued to see a strong recruitment event from 2015 that led to an increase in biomass in 2016-2018, though abundance declined in 2019 as recruitment returned to average levels (NEFSC 2020b). The Ismooth multipliers were 1.2 in the NFMA and 1.0 in the SFMA.

Table 8. NEFSC trawl survey multipliers for monkfish from the last three assessments.

Assessment year	NEFSC trawl survey multiplier	
	NFMA	SFMA
2016	1.02	0.87
2019	1.2	1.0
2022	0.829	0.646
Source: Richards (2016); NEFSC (2020b); Deroba (2022).		

The 2022 management track assessment again used the Ismooth method to develop catch advice. Like the 2016 and 2019 assessments, this assessment concluded that the status of monkfish remains unknown. The multipliers were 0.829 for NFMA and 0.646 for SFMA, tracking the decline in monkfish biomass in the NEFSC trawl surveys. The fishery catch time series was updated, including a new discard mortality rate for scallop dredges (reduced to 64% from 100%) and various data corrections (Deroba 2022).

The October 19, 2022 [Monkfish PDT memo](#) to the SSC on OFLs and ABCs details how these prior assessments were used in setting specifications.

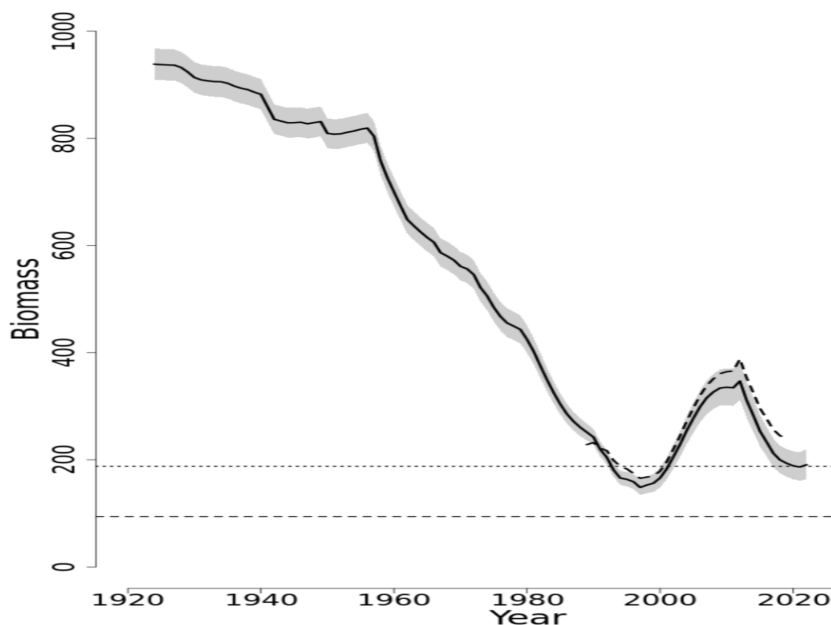
SPINY DOGFISH

Spiny dogfish Management: The spiny dogfish fishery in U.S. waters is jointly managed under the Spiny Dogfish Fishery Management Plan (FMP) by the Mid-Atlantic Fishery Management Council (MAFMC) and the New England Fishery Management Council (NEFMC), with the MAFMC having the administrative lead. The management unit area includes all U.S. east coast water. Canadian landings are also accounted for as part of setting annual specifications (the assessment integrates Canadian catch data).

Life History: Spiny dogfish (*Squalus acanthias*) is a long-lived (up to 50 years) schooling shark that is widely distributed across both sides of the North Atlantic. The Northwest Atlantic population is treated as one stock – substantial migration is not believed to occur across the two sides of the Atlantic (though tagging studies do find occasional long-distance migrators (e.g., Hjertenæs 1980, Templeman 1954). Spiny dogfish are considered one of the most migratory shark species in the northwest Atlantic (Compagno 1984). In the northwest Atlantic, spiny dogfish occur from Florida to Canada, with highest concentrations from Cape Hatteras to Nova Scotia. In the winter and spring, they are found primarily in Mid-Atlantic waters, and tend to migrate north in the summer and fall, with concentrations in southern New England, Georges Bank, and the Gulf of Maine (though a recent study has created some uncertainty regarding the established migration paradigm, Carlson 2014). Spiny dogfish have a wide-ranging diet consisting of fish, such as herring, mackerel and sand lance, as well as invertebrates including ctenophores, squid, crustaceans and bivalves. Spiny dogfish are live bearers with a very long gestation period (18-24 months) and are slow growing with late maturation. These reproductive characteristics generally make a stock more vulnerable to overfishing (<https://www.fisheries.noaa.gov/international-affairs/shark-conservation>, NOAA 2001). Females grow larger than males and as a result, the fishery primarily targets females.

Spiny Dogfish Stock Status: Based on the 2023 Spiny Dogfish management track assessment (MTA), which used the Stock Synthesis 3 (SS3) assessment model and passed peer review in 2023, the spiny dogfish stock was neither overfished nor experiencing overfishing in 2022⁵. Biomass (spawning output) in 2022 was estimated to be at 101% of the reference point/target, despite being relatively near its all-time low. Fishing mortality in 2022 was 81% of the overfishing threshold (the first time in the last decade without overfishing). Biomass and fishing mortality figures are immediately below. Due to the stock's reduced productivity, the SS3 model projections predict that relatively low future catches are needed to stay at the target (NEFSC 2023).

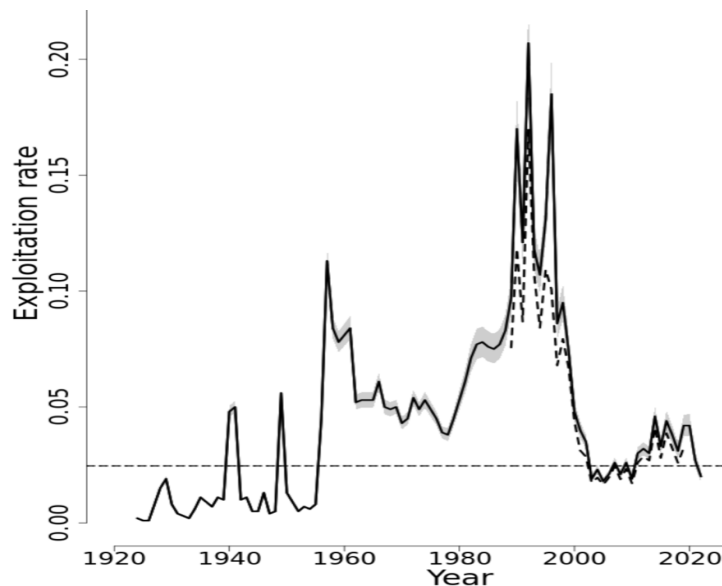
Figure 17. Time series of spawning output 1924-2022 from the accepted SS3 model with reference points (top horizontal dotted line is the target, lower dashed horizontal line is the overfished threshold).



Source: 2023 Spiny Dogfish Management Track Assessment, available at <https://www.mafmc.org/ssc-meetings/october-30-2023>

⁵ The assessment and its peer review summary are available at <https://www.mafmc.org/ssc-meetings/october-30-2023>.

Figure 18. Time series of fishing mortality 1924-2022 from the accepted SS3 model with reference points (top horizontal dotted line is the target, lower dashed horizontal line is the overfished threshold).



Source: 2023 Spiny Dogfish Management Track Assessment, available at <https://www.mafmc.org/ssc-meetings/october-30-2023>

5.2 NON-TARGET SPECIES

Note: Based on fishery differences and public input over the years from affected communities, the two Councils take slightly different approaches in describing the interaction of a fishery with Non-Target species, so the proceeding monkfish focus and the spiny dogfish focus sections differ somewhat in formatting.

MONKFISH FOCUS

The monkfish fishery is closely associated with several fisheries managed by other FMPs, specifically the groundfish, skate, spiny dogfish, and scallop fisheries. Particularly in the NFMA, monkfish can be targeted or caught as incidental bycatch during trips in which groundfish are also caught, depending on the focus of a trip. Monkfish are caught as bycatch in the scallop fishery, particularly in the SFMA. Further, skates and spiny dogfish are often caught when targeting monkfish in both areas, but particularly in the SFMA.

5.2.1 Northeast Multispecies

Life History and Population. The Northeast Multispecies FMP manages 20 groundfish stocks and stock status varies by stock (NEFMC 2022a).

In U.S. waters, cod are currently managed as two stocks: Gulf of Maine (GOM) and Georges Bank (GB). Based on the updated assessment, the GOM cod stock is overfished and overfishing is occurring for the M=0.2 model and overfished and overfishing is not occurring for the M-ramp model. Georges Bank cod,

Gadus morhua, is the most southerly cod stock in the world. Based on the 2021 assessment, overfishing status is considered unknown and stock status remains overfished based on a qualitative evaluation of poor stock condition (NEFSC 2022). Recent work by the [Atlantic Cod Stock Structure Working Group](#) proposes a new stock structure with five biological stocks in U.S. waters: Georges Bank, Southern New England, Western Gulf of Maine and Cape Cod winter spawners, Western Gulf of Maine spring spawners, and Eastern Gulf of Maine (McBride & Smedbol 2022). The Western Gulf of Maine spring spawners overlaps spatially with the Western Gulf of Maine and Cape Cod winter spawner stock. The Council is working on a transition plan for management of the current two stocks to up to five stocks and the research track working group concluded that the stocks will be assessed as four units, which passed peer review in 2023.

Six distinct haddock stocks have been identified, and the two which occur in U.S. waters are associated with Georges Bank and the Gulf of Maine. As of its 2022 assessment, GOM haddock is not overfished but overfishing is occurring; the 2021 SSB was estimated to be at 16,528 mt, which is 270% of the biomass target (NEFSC 2022 in prep). GB haddock is not overfished and overfishing is not occurring; the 2021 SSB was estimated to be 79,513 mt, which is 66% of the biomass target (NEFSC 2020b).

Off the U.S. coast, American plaice are managed as a single stock in the Gulf of Maine and Georges Bank regions. In the Gulf of Maine and Georges Bank, the American plaice is not overfished and overfishing is not occurring. The stock was in a rebuilding plan, but based on the 2019 assessment, the stock is now considered rebuilt (NEFSC 2020b).

Witch flounder is managed as a unit stock. Because a stock assessment model framework is lacking, no historical estimates of biomass, fishing mortality rate, or recruitment can be calculated. NMFS determined that the stock status for witch flounder will remain overfished, with overfishing unknown, consistent with the 2016 benchmark assessment for this stock.

Winter flounder is managed and assessed in U.S. waters as three stocks: Gulf of Maine, southern New England/Mid-Atlantic, and Georges Bank. Based on the recommendation of the 2020 Peer Review Panel, overfishing is not occurring for GOM winter flounder, but the overfished status is unknown; GB winter flounder is overfished and overfishing is not occurring; SNE/MA winter flounder is overfished, but overfishing is not occurring (NEFSC 2020).

NMFS manages three yellowtail stocks off the U.S. coast including the CC/GOM, GB, and SNE/MA stocks. Based on the 2019 operational assessment, the CC/GOM yellowtail flounder stock is not overfished and overfishing is not occurring. GB yellowtail flounder status determination relative to reference points is not possible because reference points cannot be defined; 2020 stock assessment results continue to indicate low stock biomass and poor productivity. Based on the 2019 operational assessment, the SNE/MA yellowtail flounder stock is overfished and overfishing is not occurring (NEFSC 2020b).

NMFS manages Acadian redfish inhabiting the U.S. waters of the Gulf of Maine and deeper portions of Georges Bank and the Great South Channel as a unit stock. Based on the recommendation of the 2020 Peer Review Panel, redfish is not overfished and overfishing is not occurring. Redfish is rebuilt.

Pollock are assessed as a single unit, though there is considerable movement of pollock between the Scotian Shelf, Georges Bank, and the Gulf of Maine. Based on the 2019 operational assessment, the pollock stock is not overfished and overfishing is not occurring.

White hake is common on muddy bottom throughout the Gulf of Maine. Based on the 2019 operational assessment, the white hake stock is overfished and overfishing is not occurring.

Windowpane flounders are assessed and managed as two stocks: Gulf of Maine-Georges Bank (GOM/GB or northern) and Southern New England-Mid-Atlantic Bight (SNE/MA or southern) due to differences in growth rates, size at maturity, and relative abundance trends. Based on the recommendations of the 2020 Peer Review Panel, northern windowpane flounder stock status is unknown; Southern windowpane

flounder is not overfished and overfishing is not occurring (status has not changed from the 2018 assessment) (NEFSC 2020b).

In US waters, ocean pout are assessed and managed as a unit stock from the Gulf of Maine to Delaware. Based on the 2020 assessment, ocean pout is overfished but overfishing is not occurring. The stock is not rebuilding as expected, despite low catch. Discards comprise most of the catch since the no possession regulation was implemented in May 2010.

Atlantic halibut is the largest species of flatfish and is distributed from Labrador to southern New England. Halibut is assessed using a data-poor method (First Second Derivative model), and projections are not possible using this method. Biological reference points are unknown for halibut, but the stock is considered overfished. Halibut is currently in a rebuilding plan with an end date of 2056.

Atlantic wolffish is a benthic fish distributed off Greenland to Cape Cod and sometimes in southern New England and New Jersey waters. Based on the recommendations of the 2020 Peer Review Panel, wolffish is overfished but overfishing is not occurring. Wolffish is in a rebuilding plan, but the end date is not defined.

Management and Fishery. Northeast multispecies are managed under a dual management system which breaks the fishery into two components: sectors and the common pool. For stocks that permit fishing, each sector is allotted a share of each stock's ACL that consists of the sum of individual sector member's potential sector contribution based on their annual catch entitlements. Sector allocations are strictly controlled as hard total allowable catch limits and retention is required for all stocks managed under an ACL. Overages are subject to accountability measures including payback from the sector's allocation for the following year. Common pool vessels are allocated days at sea (DAS) and their effort is further controlled by a variety of measures including trip limits, closed areas, minimum fish size and gear restrictions varying between stocks. Only a very small portion of the ACL is allotted to the common pool. Framework Adjustment 63 to the NE Multispecies FMP has more detail on the stock status and control of fishing effort (NEFMC 2022a).

5.2.2 Skates

Life History and Population. The Northeast Skate Complex Fishery Management Plan (Skate FMP) specifies the management measures for seven skate species (barndoor, clearnose, little, rosette, smooth, thorny, and winter skate) off the New England and Mid-Atlantic coasts. Specifications are set for skates as a complex (e.g., one ACL) every two years, which include possession limits for the skate wing and bait fisheries. These fisheries have different seasonal management structures and are subject to effort controls and accountability measures. Overfishing is not occurring on any of these species, and only one species, thorny skate, is overfished.

Management and Fishery. A detailed description of the commercial skate fishery and fishing communities may be found in Framework Adjustment 8 (NEFMC 2020b). The bait fishery is primarily whole little and small-winter skates, and the wing fishery is primarily large-winter and barndoor skates. There are three primary skate ports: Chatham and New Bedford, Massachusetts and Point Judith, Rhode Island; and 11 secondary ports from Massachusetts to New Jersey. The number of vessels landing skate has declined since FY 2011 (567) to 322 in FY 2020. Skate revenue has fluctuated between \$5.2-\$9.4M annually from FY 2010 to 2020, largely due to changes in wing revenue. Within the directed monkfish gillnet fishery, there is also a seasonal gillnet incidental skate fishery, in which mostly winter skates are sold for lobster bait and as cut wings for processing.

5.2.3 Atlantic Sea Scallops

Life History and Population. Sea scallops, *Placopecten magellanicus*, are distributed in the northwest Atlantic Ocean from Newfoundland to North Carolina, mainly on sand and gravel sediments where bottom temperatures remain below 20° C (68° F). North of Cape Cod, concentrations generally occur in shallow water <40 m (22 fathoms) deep. South of Cape Cod and on Georges Bank, sea scallops typically occur at depths of 25 - 200 m (14 - 110 fathoms), with commercial concentrations generally 35 - 100 m (19 - 55 fathoms). Sea scallops are filter feeders, feeding primarily on phytoplankton, but also on microzooplankton and detritus (Hart & Chute 2004). Sea scallops grow rapidly during the first several years of life. Between ages 3 and 5, they commonly increase 50 - 80% in shell height and quadruple their meat weight. Sea scallops can live more than 20 years. They usually become sexually mature at age 2, but individuals younger than age 4 probably contribute little to total egg production. Sexes are separate and fertilization is external. Spawning usually occurs in late summer and early autumn; spring spawning may also occur, especially in the Mid-Atlantic Bight. Sea scallops are highly fecund; a single large female can release hundreds of millions of eggs annually. Larvae remain in the water column for four to seven weeks before settling to the bottom. Sea scallops attain commercial size at about four to five years old, though historically, three-year-olds were often exploited. Sea scallops have a somewhat uncommon combination of life-history attributes: low mobility, rapid growth, and low natural mortality (NEFSC 2011).

Management and Fishery. The commercial fishery for sea scallops is conducted year-round, primarily using New Bedford style and turtle deflector scallop dredges. A small percentage of the fishery uses otter trawls, mostly in the Mid-Atlantic. The principal U.S. commercial fisheries are in the Mid-Atlantic (from Virginia to Long Island, New York) and on Georges Bank and neighboring areas, such as the Great South Channel and Nantucket Shoals. There is also a small, primarily inshore fishery for sea scallops in the Gulf of Maine. The NEFMC established the Scallop FMP in 1982. The scallop resource was last assessed in 2020, and it was not overfished, and overfishing was not occurring (NEFSC 2020a). Vessels targeting scallops catch monkfish and land them if the price is high enough.

SPINY DOGFISH FOCUS

Note: Based on fishery differences and public input over the years from affected communities, the two Councils take slightly different approaches in describing the interaction of a fishery with non-Target species, so the preceding monkfish focus and spiny dogfish focus sections differ somewhat in formatting.

Non-Target Species

A) Other Species Caught in Directed Spiny Dogfish Fishing

Due to reduced observer coverage after 2019⁶ (primarily related to Covid-19), observer data from 2017-2019 still best describe incidental catch in the spiny dogfish fishery. The primary database used to assess discarding is the NMFS Observer Program database, which includes data from trips that had trained observers onboard to document discards. One critical aspect of using this database to describe discards is to correctly define the trips that constitute a given directed fishery. A flexible criteria of what captains initially intend to target, how they may adjust targeting over the course of a trip, and what they actually catch would be ideal but is impracticable.

From 2017-2019, gill net gear accounted for 66%-74% of annual landings. Bottom long line gear accounted for 18-27% of annual landings. All other gears, including bottom trawl, accounted for only 7-

⁶ For example for July 2018-June 2019 there were 381 observed large or extra-large mesh Mid-Atlantic gillnet trips but only 147 for July 2021-June 2022 (<https://www.fisheries.noaa.gov/resource/data/annual-discard-reports-northeast>)

8% of annual landings and are not expected to have involved substantial targeting of spiny dogfish given current trip limits (substantial trawling for spiny dogfish would only be expected at higher trip limits given the price of spiny dogfish) and very similar intensity of bottom trawling in the region would be expected to occur even with a complete prohibition on spiny dogfish retention.

From 2017-2019 there were on average 235 observed sink gill net trips (gear # = 100) annually where spiny dogfish accounted for at least 40% of retained catch, and those trips form the basis of the following analysis to determine which other species the directed spiny dogfish fishery interacts with. These trips made 2,540 hauls of which 86% were observed. Hauls may be unobserved for a variety of reasons, for example transfer to another vessel without an observer, observer not on station, haul slipped (dumped) in the water before observing, etc. These observed hauls had a 5% discard rate, most of which was spiny dogfish.

The other species to exceed 1,000 pounds of observed catch per year (used as an ad-hoc minimum indication threshold of potentially more than negligible catch) included (annual observed catch rounded to nearest 1,000 pounds): winter/big skate (83,000 pounds), little skate (8,000 pounds), unknown skates (7,000 pounds), monkfish (6,000 pounds), smooth dogfish (4,000 pounds), cod (3,000 pounds), lobster (3,000 pounds), pollock (3,000 pounds), menhaden (2,000 pounds), haddock (1,000 pounds), and striped bass (1,000 pounds). Of these, only cod is overfished while the Southern New England lobster stock is “depleted with poor prospects of recovery” ([https://media.fisheries.noaa.gov/2022-05/2021 SOS FSSI and nonFSSI Stock Status Tables.pdf](https://media.fisheries.noaa.gov/2022-05/2021_SOS_FSSI_and_nonFSSI_Stock_Status_Tables.pdf), <http://www.asmfmc.org/species/american-lobster>). Information on skates, the most frequent bycatch species, can be found above in the section that focuses on bycatch in the monkfish fishery.

From 2017-2019 there were on average 36 observed bottom longline trips (gear # = 010) annually where spiny dogfish accounted for at least 40% of retained catch, and those trips form the basis of the following analysis to determine which other species the directed spiny dogfish fishery interacts with. These trips made 438 hauls of which 99% were observed. Hauls may be unobserved for a variety of reasons, for example transfer to another vessel without an observer, observer not on station, haul slipped (dumped) in the water before observing, etc. These observed hauls had a 10% discard rate, most of which was spiny dogfish.

The other species to exceed 1,000 pounds of observed catch per year (used as an ad-hoc minimum indication threshold of potentially more than negligible catch) included (annual observed catch rounded to nearest 1,000 pounds): golden tilefish (7,000 pounds), barndoor skate (4,000 pounds), smooth dogfish (3,000 pounds), and winter/big skate (2,000 pounds). Of these, none is overfished ([https://media.fisheries.noaa.gov/2022-05/2021 SOS FSSI and nonFSSI Stock Status Tables.pdf](https://media.fisheries.noaa.gov/2022-05/2021_SOS_FSSI_and_nonFSSI_Stock_Status_Tables.pdf)).

While not extrapolations, the above amounts appear very small relative to annual catch limits for these species, and management of these species already accounts for both landings and discards. Given the apparent low level of interactions with non-target species and ongoing management of those species, their conditions are affected predominantly by other fisheries/issues and should not be affected by this action or the operation of the spiny dogfish fishery more generally.

B. Other Managed Fisheries with Non-directed Spiny Dogfish Catch

Per NMFS’ 2020 report on Discard Estimation, Precision, and Sample Size Analyses for 14 Federally Managed Species Groups in the Waters off the Northeastern United States (NMFS 2020), a wide variety of gear types discard spiny dogfish beyond the gear types mentioned above that are responsible for most landings. These other gear types catch most of the species that exist in the region, some of which are in good condition and some of which are in an overfished condition. While this indicates that incidental spiny dogfish catch occurs across a wide variety of other managed fisheries, outside of the directed spiny dogfish fishery, spiny dogfish is often seen as a pest species (e.g. see MAFMC 2017 MSB Fishery Performance Report at <http://www.mafmc.org/s/2017-MSB-Fishery-Performance-Report.pdf>), and is

often entirely discarded (e.g. longfin squid fishery – see MAFMC 2020). As such, changes in spiny dogfish regulations are not expected to change fishing patterns for other fisheries that catch (and mostly discard) spiny dogfish or affect any of those managed species in a meaningful way. Further details about the many other managed species in the region and their current stock statuses can be found in their relevant FMPs.

5.3 PROTECTED RESOURCES

5.3.1 Atlantic Sturgeon

The life history traits of Atlantic sturgeon have been documented in historical and contemporary literature (e.g., Dees 1961; Vladykov and Greeley 1963; ASSRT 2007; Hilton et al. 2016; ASMFC 2017). Key characteristics include that spawning occurs in freshwater of a river that is part of an estuary. The early life stages are dependent on and remain in the natal estuary for months to years until they are suitably developed to enter the Atlantic Ocean, thus beginning their seasonal use of both estuarine and marine waters for the remainder of their life. They return to a freshwater tidal reach of a river estuary when they are ready to spawn. Tagging records and the relatively low rate of gene flow reported in population genetic studies provide evidence that Atlantic sturgeon typically return to their natal river to spawn (ASSRT 2007). Adults are long-lived and spawn multiple times within their lifespan but maturity occurs relatively late, anywhere from several years to more than 20 years (ASSRT 2007; Hilton et al. 2016). The age at which they mature and the time of year when they spawn varies among the river populations.

Atlantic sturgeons travel long distances in marine waters and aggregate in both ocean and estuarine areas at certain times of the year. The marine and estuarine range of all five Atlantic sturgeon DPSs as well as the two Canadian populations overlap and extends from Canada through Cape Canaveral, Florida (ASSRT 2007; Wirgin et al. 2015; Kazyak et al. 2021). Their use of the marine environment is characterized by seasonal differences in distribution with a presence in more nearshore waters in the spring, particularly near coastal estuaries, and movement to more offshore waters in the fall where the fish generally occur throughout the winter (Erickson et al. 2011; Ingram et al. 2019; Rothermel et al. 2020).

The Action Plan to Reduce Atlantic Sturgeon Bycatch in Federal Large Mesh Gillnet Fisheries (NOAA 2022) described the movements of Atlantic sturgeon in marine waters and the habitats used in greater detail as follows.

Erickson et al. (2011) provided some of the most detailed information for Atlantic sturgeon in the marine environment based on data from pop-up satellite archival tags of 15 adult Atlantic sturgeon that were captured in the freshwater reach of the Hudson River. Upon leaving the Hudson River, all of the fish used a similar depth range in summer and fall, and 13 of the 15 continued to have a similar depth pattern in the winter through spring. Mean-daily depths typically ranged from 5 to 35 m and never exceeded 40 m. The sturgeons occupied the deepest waters during winter and early spring (December–March) and shallowest waters during late spring to early fall (May–September). Mean-monthly water temperatures ranged from 8.3°C in February to 21.6°C in August for the 13 fish that exhibited similar depth distributions. Of the remaining two fish, during December and January, one sturgeon occurred at shallower depths (5-15 m) and in warmer waters, while the second fish occurred at deeper depths (35-70 m) and in colder waters. Nearly all of the sturgeon stayed within the Mid-Atlantic Bight before their tags were released. However, the sturgeon did not appear to move to a specific marine area where the fish reside throughout the winter. Instead, the sturgeon occurred within different areas of the Mid-Atlantic Bight and at different depths, occupying deeper and more southern waters in the winter months and more northern and shallow waters in the summer months with spring and fall being transition periods. Three subsequent studies, Breece et al. (2018), Ingram et al. (2019), and Rothermel et al. (2020), using

thousands of detections of acoustically-tagged Atlantic sturgeon within receiver arrays off Long Island, New Jersey, Delaware, and Maryland demonstrated that depth and water temperature are key variables associated with sturgeon presence and distribution in Mid-Atlantic marine waters. All three studies provided further evidence of seasonal inshore and offshore movements with sturgeon occupying shallower waters closer to the coast in the spring and more offshore waters in the late fall-winter. Finally, like Erickson et al., both the Ingram et al. study and the Rothermel et al. study found very low residency time for individual Atlantic sturgeon within the receiver arrays for the respective studies. This suggests that sturgeon aggregation areas in the marine environment are not areas where individual sturgeon reside for extended periods of time but are used by many sturgeon for what they provide in terms of the most suitable environmental conditions as the sturgeon move through the marine environment.

Available information suggests a similar pattern for Atlantic sturgeon distribution and occurrence within the Gulf of Maine. Altenritter et al. (2017), Novak et al. (2017), and Wippelhauser et al. (2017) provide the most recent, published literature describing Atlantic sturgeon movements within and beyond the Gulf of Maine. Each of the studies used telemetry detections of acoustically-tagged Atlantic sturgeon, many of which were initially captured in a Gulf of Maine river, suggesting that they were more likely to belong to the Gulf of Maine DPS. Their results demonstrate that the sturgeon primarily occurred in the Gulf of Maine, use more offshore waters in the fall and winter, and make seasonal coastal movements between estuaries. Some of the estuaries are known aggregation areas where sturgeon forage, and one (i.e., the Kennebec River Estuary) is the only known spawning river for the Gulf of Maine DPS.

A comprehensive analysis of Atlantic sturgeon stock composition coastwide provides further evidence that the sturgeon's natal origin influences the distribution of Atlantic sturgeon in the marine environment. While Atlantic sturgeon that originate from each of the five DPSs and from the Canadian rivers were represented in the 1,704 samples analyzed for the study, there were statistically significant differences in the spatial distribution of each DPS, and individuals were most likely to be assigned to a DPS in the same general region where they were collected (Kazyak et al. 2021). The results support the findings of previous genetic analyses that Atlantic sturgeon of a particular DPS can occur throughout its marine range but are most prevalent in the broad region of marine waters closest to the DPSs natal river(s). In comparison to its total marine range, Atlantic sturgeon belonging to: the Gulf of Maine DPS are most prevalent in the Gulf of Maine; the New York Bight DPS are most prevalent in the Mid-Atlantic Bight and are the most prevalent of all of the DPSs in the Mid-Atlantic Bight; and, the Chesapeake Bay DPS are most prevalent in the Mid-Atlantic Bight, particularly from around Delaware to Cape Hatteras.

The seasonal movements of Atlantic sturgeon are not absolute and exceptions to the general movement pattern occur. For example, two adults were detected in the Appomattox River, Virginia during the winter (C. Hager, Chesapeake Scientific, pers. comm.). Nevertheless, multiple studies using a variety of tracking methods demonstrate that Atlantic sturgeon adults and subadults typically move from coastal estuaries to marine waters in the fall and occur there throughout the winter before moving to more inshore marine waters in the spring.

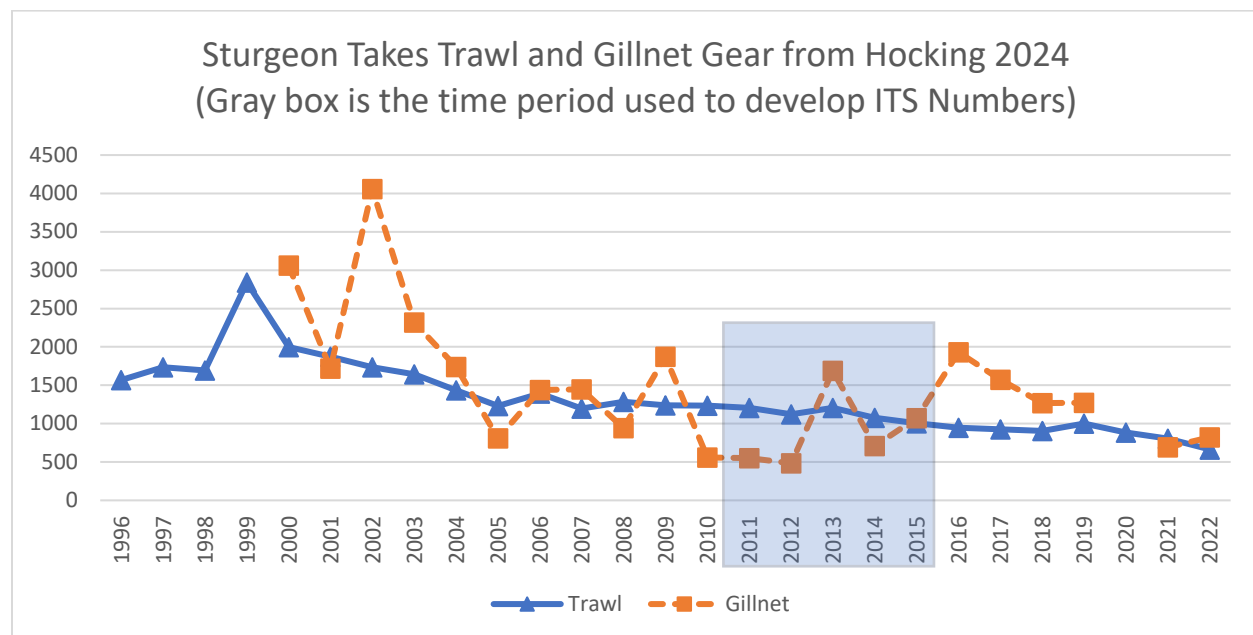
All of the Atlantic sturgeon DPSs are either at risk of extinction (i.e., those DPSs listed as endangered) or at risk of becoming endangered (i.e., the Gulf of Maine DPS) due to multiple threats that include the loss and alteration of habitat, and anthropogenic mortality. In particular, based on estimates of Atlantic sturgeon bycatch (Stein et al. 2004b; ASMFC 2007), NOAA Fisheries concluded that bycatch of Atlantic sturgeon in commercial gillnet and bottom trawl fisheries was a threat (77 FR 5880 and 77 FR 5914; February 6, 2012). NOAA Fisheries also noted in the listing determinations that there were no estimates of total abundance for any of the five DPSs but that abundance was likely orders of magnitude lower than historical abundance given the available information for adult spawning abundance and natal juvenile

abundance for some DPSs and given the reduced number of known spawning populations compared to historical records.

The ASMFC's most recent stock assessment for Atlantic sturgeon concluded that some of the DPSs have likely increased in abundance since closure of the Atlantic sturgeon fisheries in state and federal waters (ASMFC 2017). However, a lack of data hampered their efforts to assess the status of Atlantic sturgeon and there was considerable uncertainty given the data available. For example, the Stock Assessment describes that there is a relatively low probability (37 percent) that abundance of the Chesapeake Bay DPS has increased since the implementation of the 1998 fishing moratorium but, adds further clarification that it was not clear if the percent probability for the trend in abundance was a reflection of the actual trend in abundance or of the underlying data quality for the DPS. Similarly, the Stock Assessment concludes that there is a 51-percent probability that abundance of the Gulf of Maine DPS has increased since implementation of the 1998 fishing moratorium but also a relatively high likelihood (74-percent probability) that mortality for the Gulf of Maine DPS exceeds the mortality threshold used for the Stock Assessment. By comparison, more data is available for the New York Bight DPS and the Stock Assessment concludes that there is a relatively high probability (75 percent) that the New York Bight DPS abundance has increased since the implementation of the 1998 fishing moratorium, and a 69-percent probability that mortality for the New York Bight DPS does not exceed the mortality threshold used for the assessment. However, the Stock Assessment also describes that the DPS-level estimates of mortality from the tagging model had wide credible intervals, so one cannot conclude with statistical certainty whether any of the DPS-level mortality estimates are above or below its respective thresholds. New information available since the ESA-listing of the five DPSs was provided in the Stock Assessment as well as in the NOAA Fisheries [5-year reviews](#) for each DPS. Based on the new and existing information, NOAA Fisheries concluded that the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs should remain listed as endangered, and the Gulf of Maine DPS should remain listed as threatened.

The ASMFC is updating its Atlantic sturgeon assessment in 2024 and that information will be considered in the reinitiated Biological Opinion.

Figure 19. Total Estimated Gillnet Takes.



Source: Hocking 2024, available via Tables 3/4 at <https://www.mafmc.org/actions/sturgeon-bycatch-framework>. Years used for ITS highlighted (2011-2015)

5.3.2 Protected Species Present in the Area

The Monkfish FMP describes management of the monkfish fishery from Maine to North Carolina. The Spiny Dogfish FMP describes management of the spiny dogfish fishery coastwide. Although spiny dogfish are most abundant from Nova Scotia to Cape Hatteras, North Carolina, we consider here the protected species that occur throughout the coastwide management area of the spiny dogfish fishery.

Numerous protected species occur in the combined affected environment of the Monkfish FMP and of the Spiny Dogfish FMP (Table 9) and have the potential to be impacted by the proposed action (i.e., there have been observed/documented interactions in the fisheries or with gear types like those used in the fisheries (bottom trawl, gillnet gear)). These species are under NMFS jurisdiction and are afforded protection under the Endangered Species Act (ESA) of 1973 and/or the Marine Mammal Protection Act (MMPA) of 1972.

Table 9. Species protected under the ESA and/or MMPA that may occur in the monkfish or spiny dogfish fisheries affected environment.

Species	Status	Potentially impacted by this action?
Cetaceans		
North Atlantic right whale (<i>Eubalaena glacialis</i>)	Endangered	Yes
Humpback whale, West Indies DPS (<i>Megaptera novaeangliae</i>)	Protected (MMPA)	Yes
Fin whale (<i>Balaenoptera physalus</i>)	Endangered	Yes
Sei whale (<i>Balaenoptera borealis</i>)	Endangered	Yes
Blue whale (<i>Balaenoptera musculus</i>)	Endangered	No
Sperm whale (<i>Physeter macrocephalus</i>)	Endangered	Yes
Minke whale (<i>Balaenoptera acutorostrata</i>)	Protected (MMPA)	Yes
Pilot whale (<i>Globicephala</i> spp.) ²	Protected (MMPA)	Yes
Pygmy sperm whale (<i>Kogia breviceps</i>)	Protected (MMPA)	No
Dwarf sperm whale (<i>Kogia sima</i>)	Protected (MMPA)	No
Risso's dolphin (<i>Grampus griseus</i>)	Protected (MMPA)	Yes
Atlantic white-sided dolphin (<i>Lagenorhynchus acutus</i>)	Protected (MMPA)	Yes
Short Beaked Common dolphin (<i>Delphinus delphis</i>)	Protected (MMPA)	Yes
Atlantic Spotted dolphin (<i>Stenella frontalis</i>)	Protected (MMPA)	No
Striped dolphin (<i>Stenella coeruleoalba</i>)	Protected (MMPA)	No
Bottlenose dolphin WNA Northern Migratory Coastal Stock (<i>Tursiops truncatus</i>)	Protected (MMPA)	Yes
Bottlenose dolphin, WNA Southern Migratory Coastal Stock (<i>Tursiops truncatus</i>)	Protected (MMPA)	Yes
Bottlenose dolphin, Western North Atlantic (WNA) Offshore Stock (<i>Tursiops truncatus</i>)	Protected (MMPA)	Yes
Harbor porpoise (<i>Phocoena phocoena</i>)	Protected (MMPA)	Yes
Sea Turtles		
Leatherback sea turtle (<i>Dermochelys coriacea</i>)	Endangered	Yes
Kemp's ridley sea turtle (<i>Lepidochelys kempii</i>)	Endangered	Yes
Green sea turtle, North Atlantic DPS (<i>Chelonia mydas</i>)	Threatened	Yes
Loggerhead sea turtle (<i>Caretta caretta</i>), Northwest Atlantic Ocean DPS	Threatened	Yes
Hawksbill sea turtle (<i>Eretmochelys imbricata</i>)	Endangered	No
Fish		
Shortnose sturgeon (<i>Acipenser brevirostrum</i>)	Endangered	No

Species	Status	Potentially impacted by this action?
Giant manta ray (<i>Manta birostris</i>)	Threatened	Yes
Oceanic whitetip shark (<i>Carcharhinus longimanus</i>)	Threatened	No
Atlantic salmon (<i>Salmo salar</i>)	Endangered	Yes
Atlantic sturgeon (<i>Acipenser oxyrinchus</i>)		
<i>Gulf of Maine DPS</i>	Threatened	Yes
<i>New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS</i>	Endangered	Yes
Cusk (<i>Brosme brosme</i>)	Candidate	Yes
Pinnipeds		
Harbor seal (<i>Phoca vitulina</i>)	Protected (MMPA)	Yes
Gray seal (<i>Halichoerus grypus</i>)	Protected (MMPA)	Yes
Harp seal (<i>Phoca groenlandicus</i>)	Protected (MMPA)	Yes
Hooded seal (<i>Cystophora cristata</i>)	Protected (MMPA)	Yes
Critical Habitat		
North Atlantic Right Whale	ESA Designated	No
Northwest Atlantic DPS of Loggerhead Sea Turtle	ESA Designated	No
Elkhorn and Staghorn corals	ESA Designated	No
Smalltooth Sawfish (U.S. DPS)	ESA Designated	No
<p><i>Note:</i> Marine mammal species italicized and in bold are considered MMPA strategic stocks, a marine mammal stock for which: (1) the level of direct human-caused mortality exceeds the potential biological removal level; (2) based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; and/or (3) is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA (Sect. 3, MMPA of 1972).</p> <p>² There are 2 species of pilot whales: short finned (<i>G. melas melas</i>) and long finned (<i>G. macrorhynchus</i>). Due to the difficulties in identifying the species at sea, they are often just referred to as <i>Globicephala spp.</i></p>		

5.3.3 Species and Critical Habitat Unlikely to be Impacted by the Proposed Action

Based on available information, it has been determined that this action is unlikely to impact multiple ESA listed and/or MMPA protected species or any designated critical habitat (Table 9). This determination has been made because either the occurrence of the species is not known to overlap with the area primarily affected by the action and/or based on the most recent ten years of observer, stranding, and/or marine mammal serious injury and mortality reports, there have been no observed or documented interactions between the species and the primary gear type (i.e., bottom trawl and gillnet) used to prosecute the monkfish fishery or the spiny dogfish fishery (Greater Atlantic Region (GAR) Marine Animal Incident Database, unpublished data; NMFS [Marine Mammal Stock Assessment Reports \(SARs\) for the Atlantic Region](#); NMFS NEFSC observer/sea sampling database, unpublished data; NMFS NEFSC marine mammal (small cetacean, pinniped, baleen whale) serious injury and mortality [Reference Documents, Publications](#), or [Technical Memoranda](#); [MMPA List of Fisheries \(LOF\)](#); NMFS 2021a).⁷ In the case of critical habitat, this determination has been made because the action will not affect the essential physical and biological features of critical habitat identified in Table 9 and therefore, will not result in the destruction or adverse modification of any species critical habitat (NMFS 2021a).

⁷ For marine mammals protected under the MMPA, the most recent 10 years of observer, stranding, and/or marine mammal serious injury and mortality reports are from 2010-2019. For ESA listed species, information on observer or documented interactions with fishing gear is from 2010-2019.

The protected species and critical habitat that occur only within the extended range of the spiny dogfish management area (e.g., Hawksbill sea turtle and critical habitat for Johnson’s sea grass, Smalltooth sawfish, Elkhorn and Staghorn corals) are unlikely to be impacted by this action (Table 7). Therefore, for this action, the combined affected environment is the same even though the management areas for the monkfish fishery and the spiny dogfish fishery are not the same.

5.3.4 Species Potentially Impacted by the Proposed Action

Table 9 lists protected species of sea turtle, marine mammal, and fish species present in the affected environment of the monkfish and spiny dogfish fisheries, and that may also be impacted by the operation of these fisheries; that is, have the potential to become entangled or bycaught in the fishing gear used to prosecute the fisheries.

To aid in the identification of MMPA protected species potentially impacted by the action, NMFS [Marine Mammal SARs for the Atlantic Region](#), [MMPA List of Fisheries \(LOF\)](#), NMFS (2021b), NMFS NEFSC observer/sea sampling database (unpublished data), and NMFS NEFSC marine mammal (small cetacean, pinniped, baleen whale) serious injury and mortality [Reference Documents](#), [Publications](#), or [Technical Memoranda](#) were referenced.

To help identify ESA listed species potentially impacted by the action, the NMFS NEFSC observer/sea sampling, Sea Turtle Disentanglement Network (STDN), and the GAR Marine Animal Incident databases for interactions were queried and the May 27, 2021, Biological Opinion issued by NMFS was reviewed (NMFS 2021a).

As the primary concern for both MMPA protected and ESA listed species is the potential for the monkfish fishery and the spiny dogfish fishery to interact (e.g., bycatch) with these species it is necessary to consider (1) species occurrence in the affected environment of each of these fisheries and how the fisheries will overlap in time and space with this occurrence; and (2) data and observed records of protected species interaction with particular fishing gear types, to understand the potential risk of an interaction. Information on species occurrence in the affected environment of the monkfish and spiny dogfish fisheries and on protected species interactions with specific fishery gear is provided below.

5.3.4.1 Sea Turtles

Below is a summary of the status and trends, and the occurrence and distribution of sea turtles in the affected environment of the monkfish fishery and spiny dogfish fishery. More information on the range-wide status of affected sea turtles species, and their life history is in several published documents, including NMFS (2021a); sea turtle status reviews and biological reports (Conant *et al.* 2009; Hirth 1997; NMFS & USFWS 1995; 2007a; b; 2013; TEWG 1998; 2000; 2007; 2009), and recovery plans for the loggerhead (Northwest Atlantic DPS) sea turtle (NMFS & USFWS 2008), leatherback sea turtle (NMFS & USFWS 1992; 1998b; 2020), Kemp’s ridley sea turtle (NMFS & USFWS 2011), and green sea turtle (North Atlantic DPS) (NMFS & USFWS 1991; 1998a).

Status and Trends.

Four sea turtle species have the potential to be impacted by the proposed action: Northwest Atlantic Ocean DPS of loggerhead, Kemp’s ridley, North Atlantic DPS of green, and leatherback sea turtles (Table 9). Although stock assessments and similar reviews have been completed for sea turtles none have been able to develop a reliable estimate of absolute population size. As a result, nest counts are used to inform population trends for sea turtle species.

For the Northwest Atlantic Ocean DPS of loggerhead sea turtles, there are five unique recovery units that comprise the DPS. Nesting trends for each of these recovery units are variable; however, Florida index nesting beaches comprise most of the nesting in the DPS (<https://myfwc.com/research/wildlife/sea-turtles/nesting/beach-survey-totals/>). Overall, short-term trends for loggerhead sea turtles (Northwest

Atlantic Ocean DPS) have shown increases; however, over the long-term the DPS is considered stable (NMFS 2021a).

For Kemp's ridley sea turtles, from 1980-2003, the number of nests at three primary nesting beaches (Rancho Nuevo, Tepehuajes, and Playa Dos) increased 15% annually (Heppell *et al.* 2005a); however, due to recent declines in nest counts, decreased survival of immature and adult sea turtles, and updated population modeling, this rate is not expected to continue and therefore, the overall trend is unclear (Caillouet *et al.* 2018; NMFS & USFWS 2015). In 2019, there were 11,090 nests, a 37.61% decrease from 2018 and a 54.89% decrease from 2017, which had the highest number (24,587) of nests; the reason for this recent decline is uncertain (NMFS 2021a). Given this and continued anthropogenic threats to the species, according to NMFS (2021a), the species resilience to future perturbation is low.

The North Atlantic DPS of green sea turtle, overall, is showing a positive trend in nesting; however, increases in nester abundance for the North Atlantic DPS in recent years must be viewed cautiously as the datasets represent a fraction of a green sea turtle generation which is between 30 and 40 years (Seminoff *et al.* 2015). While anthropogenic threats to this species continue, considering the best available information on the species, NMFS (2021a), concluded that the North Atlantic DPS seems somewhat resilient to future perturbations.

Leatherback turtle nesting in the Northwest Atlantic is showing an overall negative trend, with the most notable decrease occurring during the most recent time frame of 2008 to 2017 (Northwest Atlantic Leatherback Working Group 2018). The leatherback status review in 2020 concluded that leatherbacks are exhibiting an overall decreasing trend in annual nesting activity (NMFS & USFWS 2020). Given continued anthropogenic threats to the species, according to NMFS (2021a), the species' resilience to additional perturbation both within the Northwest Atlantic and worldwide is low.

Occurrence and Distribution.

Hard-shelled sea turtles. In U.S. Northwest Atlantic waters, hard-shelled turtles commonly occur throughout the continental shelf from Florida to Cape Cod, MA, although their presence varies with the seasons due to changes in water temperature (Braun-McNeill *et al.* 2008; Braun & Epperly 1996; Epperly *et al.* 1995a; Epperly *et al.* 1995b). As coastal water temperatures warm in the spring, loggerheads begin to migrate to inshore waters of the southeast United States and also move up the Atlantic Coast (Braun-McNeill & Epperly 2002; Epperly *et al.* 1995a; Epperly *et al.* 1995b; Epperly *et al.* 1995c; Griffin *et al.* 2013; Morreale & Standora 2005; NMFS & USFWS 2020), occurring in Virginia foraging areas as early as late April and on the most northern foraging grounds in the GOM in June (Shoop & Kenney 1992). The trend is reversed in the fall as water temperatures cool. The large majority leave the GOM by September, but some remain in Mid-Atlantic and Northeast areas until late fall (i.e., November). By December, sea turtles have migrated south to waters offshore of North Carolina, particularly south of Cape Hatteras, and further south, although it should be noted that hard-shelled sea turtles can occur year-round in waters off Cape Hatteras and south (Epperly *et al.* 1995a; Griffin *et al.* 2013; Hawkes *et al.* 2011; Shoop & Kenney 1992).

Leatherback sea turtles. Leatherbacks, a pelagic species, are known to use coastal waters of the U.S. continental shelf and to have a greater tolerance for colder water than hard-shelled sea turtles (Dodge *et al.* 2014; Eckert *et al.* 2006; James *et al.* 2005; Murphy *et al.* 2006; NMFS & USFWS 2013). Leatherback sea turtles engage in routine migrations between northern temperate and tropical waters (Dodge *et al.* 2014; James *et al.* 2005; James *et al.* 2006; NMFS & USFWS 1992). They are found in more northern waters (i.e., GOM) later in the year (i.e., similar time frame as hard-shelled sea turtles), with most leaving the Northwest Atlantic shelves by mid-November (Dodge *et al.* 2014; James *et al.* 2005; James *et al.* 2006).

5.3.4.2 Large Whales

Status and Trends.

Six large whale species have the potential to be impacted by the proposed action: humpback, North Atlantic right, fin, sei, sperm, and minke whales (Table 10). Linden (2023) indicates continued annual mortalities above recovery thresholds (i.e. the Potential Biological Removal Level) for North Atlantic right whale population; however, for fin, humpback, minke, sperm, and sei whales, it is unknown what the population trajectory is as a trend analysis has not been conducted. The NMFS [Marine Mammal SARs for the Atlantic Region](#) has more information on the status of humpback, North Atlantic right, fin, sei, sperm, and minke whales.

Occurrence and Distribution.

As in Table 10, North Atlantic right, humpback, fin, sei, sperm, and minke whales occur in the Northwest Atlantic Ocean. As large whales may be present in these waters throughout the year, the monkfish fishery and spiny dogfish fishery are likely to co-occur with large whales in the affected area for at least some part of each year. To further help understand how the monkfish fishery and the spiny dogfish fishery overlap in time and space with large whales, Table 8 has an overview of species occurrence and distribution in the affected environment. More information on North Atlantic right, humpback, fin, sei, sperm, and minke whales is in: NMFS [Marine Mammal SARs for the Atlantic Region](#).

Table 10. Large whale occurrence, distribution, and habitat use in the affected environment.

Species	Occurrence/Distribution/Habitat Use in the Affected Environment
North Atlantic Right Whale	<ul style="list-style-type: none"> Predominantly occupy waters of the continental shelf, but based on passive acoustic and telemetry data, are also known to make lengthy excursions into deep waters off the shelf. Visual and acoustic data demonstrate broad scale, year-round presence along the U.S. eastern seaboard (e.g., GOM, New Jersey, and Virginia). Surveys have demonstrated the existence of several areas where North Atlantic right whales congregate seasonally, including Cape Cod Bay; Massachusetts Bay; and the continental shelf south of New England. Although whales can be found consistently in certain locations throughout their range, there is high inter-annual variability in right whale use of some habitats. Since 2010, acoustic and visual surveys indicate a shift in habitat use patterns, including: <ul style="list-style-type: none"> > Fewer individuals are detected in the Great South Channel; > increase in the number of individuals using Cape Cod Bay (i.e., during the expected late winter and early spring foraging period and during the ‘off season’ period of summer and fall); > apparent abandonment of central GOM in the winter; and, > Large increase in the numbers of whales detected in a region south of Martha’s Vineyard and Nantucket Islands. Presence in this area is almost year-round, with highest sighting rates from winter through early spring > Passive acoustic monitoring suggests a shift to a year-round presence in the Mid-Atlantic, including year-round detections in the New York Bight with the highest presence between late February and mid-May in the shelf zone and nearshore habitat).
Humpback	<ul style="list-style-type: none"> Distributed throughout all continental shelf waters of the Mid-Atlantic (SNE included), GOM, and GB throughout the year. New England waters (GOM and GB) = Foraging Grounds (~March- November); however, acoustic detections of humpbacks indicate year-round presence in New England waters, including the waters of Stellwagen Bank. Mid-Atlantic waters: Increasing evidence that mid-Atlantic areas are becoming an important habitat for juvenile humpback whales.

Species	Occurrence/Distribution/Habitat Use in the Affected Environment
	<ul style="list-style-type: none"> • Since 2011, increased sightings of humpback whales in the New York-New Jersey Harbor Estuary, in waters off Long Island, and along the shelf break east of New York and New Jersey. • Increasing visual and acoustic evidence of whales remaining in mid- and high-latitudes throughout the winter (e.g., Mid- Atlantic: waters near Chesapeake and Delaware Bays, peak presence about January through March; Massachusetts Bay: peak presence about March-May and September-December).
Fin	<ul style="list-style-type: none"> • Distributed throughout all continental shelf waters of the GOM to Mid-Atlantic; • Recent sighting data show evidence that, while densities vary seasonally, fin whales are present in every season throughout most of the EEZ north of 30°N. • New England waters (GOM and GB) = Major Foraging Ground
Sei	<ul style="list-style-type: none"> • Primarily found in deep waters along the shelf edge, shelf break, and ocean basins between banks.; however incursions into shallower, shelf waters do occur (e.g., Stellwagen Bank, Great South Channel, waters south of Nantucket, Georges Bank). • Spring through summer, sightings concentrated along the northern, eastern (into Northeast Channel) and southwestern (in the area of Hydrographer Canyon) edge of Georges Bank, and south of Nantucket, MA. • Recent acoustic detections peaked in northern latitudes in the summer, indicating feeding grounds ranging from Southern New England through the Scotian Shelf. • Persistent year-round detections in Southern New England and the New York Bight indicate this area to be an important region for sei whales. • The wintering habitat remains largely unknown. Passive acoustic monitoring conducted in 2015-2016 off Georges Bank detected sei whales calls from late fall through the winter along the southern Georges Bank region (off Heezen and Oceanographer Canyons).
Sperm	<ul style="list-style-type: none"> • Distributed on the continental shelf edge, continental slope, and into mid-ocean regions. • Seasonal Occurrence in the U.S. EEZ: <ul style="list-style-type: none"> >Winter: concentrated east and northeast of Cape Hatteras; >Spring: center of distribution shifts northward to east of Delaware and Virginia, and is widespread throughout the central portion of the mid-Atlantic bight and the southern portion of Georges Bank; >Summer: similar distribution to spring, but also includes the area east and north of Georges Bank and into the Northeast Channel region, and the continental shelf (inshore of the 100-m isobath) south of New England; and, >Fall: occur in high levels south of New England, on the continental shelf. Also occur along continental shelf edge in the mid-Atlantic bight.
Minke	<ul style="list-style-type: none"> • Widely distributed within the U.S. EEZ. • Spring to Fall: widespread (acoustic) occurrence on the continental shelf; most abundant in New England waters during this period of time. • September to April: high (acoustic) occurrence in deep-ocean waters.
<p><i>Note:</i> SNE=Southern New England; GOM=Gulf of Maine; GB=Georges Bank</p> <p><i>Sources:</i> Baumgartner et al. (2011; 2007); Baumgartner and Mate (2005); Bort et al. (2015); Brown et al. (Brown et al. 2018; 2002); CETAP (1982); Charif et al. (2020); Cholewiak et al. (2018); Clapham et al. (1993); Clark and Clapham (2004); Cole et al. (2013); Davis et al. (2017; 2020); Ganley et al. (2019); Good (2008); Hain et al. (1992); Hamilton and Mayo (1990); Hayes et al. (2017; 2018; 2019; 2020; 2021; 2022); Kenney et al. (1986; 1995); Khan et al. (2010; 2011; 2012; 2009); Kraus et al. (2016); Leiter et al. (2017); Mate et al. (1997); Mayo et al. (2018); McLellan et al. (2004); Moore et al. (2021); Morano et al. (2012); Muirhead et al. (2018); Murray et al. (2013); NMFS (1991; 2005; 2010; 2011; 2021a; b) 2012; 2015; NOAA (2008); Pace and Merrick (2008); Palka et al. (2017); Palka (2020)2020; Payne et al. (1984; 1990); Pendleton et al. (2009); Record et al.</p>	

Species	Occurrence/Distribution/Habitat Use in the Affected Environment
	(2019); Risch et al. (2013); Robbins (2007); Roberts et al. (2016); Salisbury et al. (2016); Schevill et al. (1986); Stanistreet et al. (2018); Stone et al. (2017); Swingle et al. (1993); Vu et al. (2012); Watkins and Schevill (1982); Whitt et al. (2013); Winn et al. (1986); 81 FR 4837 (January 27, 2016); 86 FR 51970 (September 17, 2021).

5.3.4.3 Small Cetaceans

Status and Trends. Risso's, white-sided, short beaked common, and bottlenose dolphins (Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal stocks); long and short – finned pilot whales; and harbor porpoise are identified as having the potential to be impacted by the proposed action (Table 11). The latest stock assessment (Hayes *et al.* 2021) indicates that as a trend analysis has not been conducted for Risso's, white-sided, short-beaked common dolphins; long-finned pilot whales; or harbor porpoise, the population trajectory for these species is unknown. For short-finned pilot whales a generalized linear model indicated no significant trend in the abundance estimates (Hayes *et al.* 2022). For the Western North Atlantic Offshore stock, review of the most recent information on the stock shows no statistically significant trend in population size for this species; however, the high level of uncertainty in the estimates limits the ability to detect a statistically significant trend. Regarding the Northern and Southern Migratory Coastal stocks (both considered a strategic stock under the MMPA), the most recent analysis of trends in abundance suggests a probable decline in stock size between 2010–2011 and 2016, concurrent with a large unusual mortality event (UME) in the area; however, there is limited power to evaluate trends given uncertainty in stock distribution, lack of precision in abundance estimates, and a limited number of surveys (Hayes *et al.* 2021).

Occurrence and Distribution. Atlantic white sided dolphins, short and long finned pilot whales, Risso's dolphins, short beaked common dolphins, harbor porpoise, and several stocks of bottlenose dolphins are found throughout the year in the Northwest Atlantic Ocean (see NMFS [Marine Mammal SARs for the Atlantic Region](#)). Within this range, however, there are seasonal shifts in species distribution and abundance. To further assist in understanding how the monkfish fishery and the spiny dogfish fishery overlap in time and space with the occurrence of small cetaceans, Table 11 gives an overview of species occurrence and distribution in the affected environment of the monkfish and spiny dogfish fisheries for this action. More information on small cetacean occurrence and distribution in the Northwest Atlantic is in the NMFS [Marine Mammal SARs for the Atlantic Region](#).

Table 11. Small cetacean occurrence and distribution in the affected environment.

Species	Occurrence and Distribution in the Affected Environment
Atlantic White Sided Dolphin	<ul style="list-style-type: none"> • Distributed throughout the continental shelf waters (primarily to 100 m) of the Mid-Atlantic (north of 35°N), SNE, GB, and GOM; however, most common in continental shelf waters from Hudson Canyon (~39°N) to GB, and into the GOM. • January-May: low densities found from GB to Jeffreys Ledge. • June-September: Large densities found from GB, through the GOM. • October-December: intermediate densities found from southern GB to southern GOM. • South of GB (SNE and Mid-Atlantic), particularly around Hudson Canyon, low densities found year-round, • Virginia (VA) and North Carolina (NC) waters represent southern extent of species range during winter months.
Short Beaked Common Dolphin	<ul style="list-style-type: none"> • Regularly found throughout the continental shelf-edge-slope waters (primarily between the 100-2,000 m isobaths) of the Mid-Atlantic, SNE, and GB (esp. in Oceanographer, Hydrographer, Block, and Hudson Canyons). • Less common south of Cape Hatteras, NC, although schools have been reported as far south as the Georgia/South Carolina border. • January-May: occur from waters off Cape Hatteras, NC, to GB (35° to 42°N).

Species	Occurrence and Distribution in the Affected Environment
	<ul style="list-style-type: none"> • Mid-summer-autumn: Occur in the GOM and on GB; <i>Peak abundance</i> found on GB in the autumn.
Risso's Dolphin	<ul style="list-style-type: none"> • Spring through fall: Distributed along the continental shelf edge from Cape Hatteras, NC, to GB. • Winter: distributed in the Mid-Atlantic Bight, extending into oceanic waters. • Rarely seen in the GOM; primarily a Mid-Atlantic continental shelf edge species (can be found year-round).
Harbor Porpoise	<ul style="list-style-type: none"> • Distributed throughout the continental shelf of the Mid-Atlantic, SNE, GB, and GOM. • July-September: Concentrated in the northern GOM (waters <150 m); low numbers can be found on GB. • October-December: widely dispersed in waters from New Jersey (NJ) to Maine (ME); seen from the coastline to deep waters (>1,800 m). • January-March: intermediate densities in waters off NJ to NC; low densities found in waters off New York (NY) to GOM. • April-June: widely dispersed from NJ to ME; seen from the coastline to deep waters (>1,800 m). • Passive acoustic monitoring indicates regular presence from January through May offshore of Maryland.
Bottlenose Dolphin	<p><u>Western North Atlantic Offshore Stock</u></p> <ul style="list-style-type: none"> • Distributed primarily along the outer continental shelf and continental slope in the Northwest Atlantic from GB to Florida (FL). • Depths of occurrence: ≥40 m <p><u>Western North Atlantic Northern Migratory Coastal Stock</u></p> <ul style="list-style-type: none"> • Most common in coastal waters <20 m deep. • Warm water months (e.g., July-August): distributed from the coastal waters from the shoreline to about 25-m isobaths between the mouth of the Chesapeake Bay and Long Island, NY. • Cold water months (e.g., January-March): stock occupies coastal waters from Cape Lookout, NC, to the NC/VA border. <p><u>Western North Atlantic Southern Migratory Coastal Stock</u></p> <ul style="list-style-type: none"> • Most common in coastal waters <20 m deep. • October-December: appears stock occupies waters of southern NC (south of Cape Lookout) • January-March: appears stock moves as far south as northern FL. • April-June: stock moves north to waters of NC. • July-August: stock is presumed to occupy coastal waters north of Cape Lookout, NC, to the eastern shore of VA (as far north as Assateague).
Pilot Whales: Short- and Long-Finned	<p><u>Short-Finned Pilot Whales</u></p> <ul style="list-style-type: none"> • Except for area of overlap (see below), primarily occur south of 40°N (Mid-Atlantic and SNE waters); although low numbers have been found along the southern flank of GB, but no further than 41°N. • Distributed primarily near the continental shelf break of the Mid-Atlantic and SNE (i.e., off Nantucket Shoals). <p><u>Long-Finned Pilot Whales</u></p> <ul style="list-style-type: none"> • Except for area of overlap (see below), primarily occur north of 42°N. • Winter to early spring: distributed principally along the continental shelf edge off the northeastern U.S. coast. • Late spring through fall: movements and distribution shift onto GB and into the GOM and more northern waters. • Species tends to occupy areas of high relief or submerged banks.

Species	Occurrence and Distribution in the Affected Environment
	Area of Species Overlap: along the mid-Atlantic shelf break between Delaware and the southern flank of GB.
<p><i>Notes:</i> Information is representative of small cetacean occurrence in the Northwest Atlantic continental shelf waters out to 2,000 m depth.</p> <p><i>Sources:</i> Hayes et al. (2017; 2018; 2019; 2020; 2022); Payne and Heinemann (1993); Payne et al. (1984); Jefferson et al. (2009).</p>	

5.3.4.4 Pinnipeds

Status and Trends. Harbor, gray, harp and hooded seals are identified as having the potential to be impacted by the proposed action (Table 12). Based on Hayes et al. (2019; 2022), the status of the:

- Western North Atlantic harbor seal and hooded seal, relative to Optimum Sustainable Population (OSP), in the U.S. Atlantic EEZ is unknown;
- Gray seal population relative to OSP in U.S. Atlantic EEZ waters is unknown, but the stock's abundance appears to be increasing in Canadian and U.S. waters; and,
- Harp seal stock, relative to OSP, in the U.S. Atlantic EEZ is unknown, but the stock's abundance appears to have stabilized.

Occurrence and Distribution. Harbor, gray, harp, and hooded seals are found in the nearshore, coastal waters of the Northwest Atlantic Ocean. Depending on species, they may be present year-round or seasonally in some portion of the affected environment of the monkfish fishery. Table 12 gives an overview of pinniped occurrence and distribution in the affected environment of the monkfish and spiny dogfish fisheries for this action. More information on pinniped occurrence and distribution in the Northwest Atlantic is in the NMFS [Marine Mammal SARs for the Atlantic Region](#).

Table 12. Pinniped occurrence and distribution in the affected environment.

Species	Occurrence and Distribution in the Affected Environment
Harbor Seal	<ul style="list-style-type: none"> • Year-round inhabitants of Maine; • September through late May: occur seasonally along the coasts from southern New England to Virginia.
Gray Seal	<ul style="list-style-type: none"> • Ranges from New Jersey to Labrador, Canada.
Harp Seal	<ul style="list-style-type: none"> • Winter-Spring (approx. January-May): Can occur in the U.S. Atlantic Exclusive Economic Zone. • Sightings and strandings have been increasing off the east coast of the United States from Maine to New Jersey.
Hooded Seal	<ul style="list-style-type: none"> • Highly migratory and can occur in waters from Maine to Florida. These appearances usually occur between January and May in New England waters, and in summer and autumn off the southeast U.S. coast and in the Caribbean.
<i>Sources:</i> Hayes et al. (2019, for hooded seals; 2022).	

5.3.4.5 Atlantic sturgeon

Status and Trends. As in Table 9, Atlantic sturgeon (all five DPSs) have the potential to be impacted by the proposed action. Population trends for Atlantic sturgeon are difficult to discern; however, the most

recent stock assessment report concludes that Atlantic sturgeon, at both coastwide and DPS level, are depleted relative to historical levels (ASMFC 2017a; ASSRT 2007; NMFS 2021a).

Occurrence and Distribution. The marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range (Altenritter *et al.* 2017; ASMFC 2017b; ASSRT 2007; Breece *et al.* 2016; Breece *et al.* 2017; Dadswell 2006; Dadswell *et al.* 1984; Dovel & Berggren 1983; Dunton *et al.* 2015; Dunton *et al.* 2010; Erickson *et al.* 2011; Hilton *et al.* 2016; Ingram *et al.* 2019; Kynard *et al.* 2000; Laney *et al.* 2007; Novak *et al.* 2017; O'Leary *et al.* 2014; Rothermel *et al.* 2020; Stein *et al.* 2004a; Waldman *et al.* 2013; Wippelhauser *et al.* 2017; Wirgin *et al.* 2015a; Wirgin *et al.* 2015b).

Based on fishery-independent and dependent surveys, and data collected from genetic, tracking, and/or tagging studies in the marine environment, Atlantic sturgeon appear to primarily occur inshore of the 50 meter depth contour; however, Atlantic sturgeon are not restricted to these depths, as excursions into deeper continental shelf waters have been documented (Altenritter *et al.* 2017; Breece *et al.* 2016; Breece *et al.* 2018; Collins & Smith 1997; Dunton *et al.* 2010; Erickson *et al.* 2011; Ingram *et al.* 2019; Novak *et al.* 2017; Rothermel *et al.* 2020; Stein *et al.* 2004a; b; Wippelhauser *et al.* 2017). Data from fishery-independent and dependent surveys, and data collected from genetic, tracking, and/or tagging studies also indicate that Atlantic sturgeon make seasonal coastal movements from marine waters to river estuaries in the spring and from river estuaries to marine waters in the fall; however, there is no evidence to date that all Atlantic sturgeon make these seasonal movements and therefore, may be present throughout the marine environment throughout the year (Altenritter *et al.* 2017; Dunton *et al.* 2010; Erickson *et al.* 2011; Ingram *et al.* 2019; Novak *et al.* 2017; Rothermel *et al.* 2020; Wippelhauser 2012; Wippelhauser *et al.* 2017).

More information on the biology and range wide distribution of each DPS of Atlantic sturgeon is in 77 FR 5880 and 77 FR 5914 (February 6, 2012); the Atlantic Sturgeon Status Review Team's (ASSRT) 2007 status review of Atlantic sturgeon (ASSRT 2007); the ASMFC 2017 Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report (ASMFC 2017a); NMFS (2021a); and, the [5-year review](#) for each Atlantic sturgeon DPS.

5.3.4.6 Atlantic salmon

Status and Trends. As in Table 10, Atlantic salmon (GOM DPS) have the potential to be impacted by the proposed action. There is no population growth rate available for GOM DPS Atlantic salmon; however, the consensus is that the DPS exhibits a continuing declining trend (NMFS 2021a; NMFS & USFWS 2018; NOAA 2016).

Occurrence and Distribution. The wild populations of Atlantic salmon are listed as endangered under the ESA. Their freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River, while the marine range of the GOM DPS extends from the GOM (primarily the northern portion) to the coast of Greenland (Fay *et al.* 2006; NMFS & USFWS 2005; 2016). In general, smolts, post-smolts, and adult Atlantic salmon may be present in the GOM and coastal waters of Maine in the spring (beginning in April), and adults may be present throughout the summer and fall months (Baum 1997; Fay *et al.* 2006; Hyvärinen *et al.* 2006; Lacroix & Knox 2005; Lacroix & McCurdy 1996; Lacroix *et al.* 2004; NMFS & USFWS 2005; 2016; Reddin 1985; Reddin & Friedland 1993; Reddin & Short 1991; Sheehan *et al.* 2012; USASAC 2004). More information on the on the biology and range wide distribution of the GOM DPS of Atlantic salmon is in NMFS and USFWS (2005; 2016); Fay *et al.* (2006); and NMFS (2021a).

5.3.4.7 Giant Manta Ray

Status and Trends. Giant manta rays have the potential to be impacted by the proposed action (Table 9). While there is considerable uncertainty regarding the giant manta ray's current abundance throughout its

range, the best available information indicates that in areas where the species is not subject to fishing, populations may be stable (NMFS 2021a). However, in regions where giant manta rays are (or were) actively targeted or caught as bycatch populations appear to be decreasing (Miller & Klimovich 2017).

Occurrence and Distribution. Based on the giant manta ray's distribution, the species may occur in coastal, nearshore, and pelagic waters off the U.S. east coast, usually found in water temperatures between 19 and 22°C and have been observed as far north as New Jersey. Given that the species is rarely identified in the fisheries data in the Atlantic, it may be assumed that populations within the Atlantic are small and sparsely distributed (Miller & Klimovich 2017).

5.3.5 Gear Interactions and Protected Species

Protected species are at risk of interacting with various types of fishing gear, with interaction risks associated with gear type, quantity, soak or tow duration, and degree of overlap between gear and protected species. Information on observed or documented interactions between gear and protected species is available from as early as 1989 (NMFS Marine Mammal SARs for the Atlantic Region; NMFS NEFSC observer/sea sampling database, unpublished data). As the distribution and occurrence of protected species and the operation of fisheries (and, thus, risk to protected species) have changed over the last 30 years, we use the most recent 10 years of available information to best capture the current risk to protected species from fishing gear. For marine mammals protected under the MMPA, the most recent 10 years of information on estimated bycatch of small cetacean and pinnipeds in commercial fisheries covers the timeframe between 2011-2020; for large baleen whales, confirmed human caused serious injury, mortality, and entanglement reports are from 2012-2021 (GAR Marine Animal Incident Database, unpublished data; Cole *et al.* 2013; Hayes *et al.* 2017; 2018; 2019; 2020; Hayes *et al.* 2021; Hayes *et al.* 2022; Hayes *et al.* 2023; Henry *et al.* 2017; Henry *et al.* 2016; Henry *et al.* 2019; Henry *et al.* 2020; Henry *et al.* 2021; Henry *et al.* 2022; Henry *et al.* 2023; Waring *et al.* 2016). For ESA listed species, the most recent ten years of data on observed or documented interactions is available from 2013-2022 (ASMFC 2017a; Kocik *et al.* 2014; unpublished data: GAR Marine Animal Incident Database, NMFS NEFSC observer/sea sampling database, GAR Sea Turtle and Disentanglement Network, NMFS Sea Turtle Stranding and Salvage Network; NMFS 2021a) (NMFS Marine Mammal SARs for the Atlantic Region; NMFS NEFSC protected species serious injury and mortality [Reference Documents](#), [Publications](#), or [Technical Memoranda](#)). Available information on gear interactions with a given species (or species group) is in the sections below. This is not a comprehensive review of all fishing gear types known to interact with a given species; emphasis is on the main gear types used to prosecute the monkfish and spiny dogfish fisheries (i.e., sink gillnet and bottom trawl gear).

5.3.5.1 Sea Turtles

Bottom Trawl Gear. Bottom trawl gear poses an injury and mortality risk to sea turtles (Sasso & Epperly 2006; NMFS Observer Program, unpublished data). Since 1989, the date of our earliest observer records for federally managed fisheries, sea turtle interactions with trawl gear have been observed in the GOM, Georges Bank, and/or the Mid-Atlantic; however, most of the observed interactions have been observed south of the GOM (Murray 2008; 2015; 2020; NMFS 2021a; Warden 2011a; NMFS NEFSC observer/sea sampling database, unpublished data; 2011b). As few sea turtle interactions have been observed in the GOM, there is insufficient data available to conduct a robust model-based analysis and bycatch estimate of sea turtle interactions with trawl gear in this region. As a result, the bycatch estimates and discussion below are for trawl gear in the Mid-Atlantic and Georges Bank.

Murray (2015) estimated that from 2009-2013, the total average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic was 231 (CV=0.13, 95% CI=182-298); this equates to approximately 33 adult equivalents. Most recently, Murray (2020) provided information on sea turtle interaction rates from 2014-2018 (the most recent five-year period that has been statistically analyzed for trawls). Interaction rates were stratified by region, latitude zone, season, and depth. The highest loggerhead interaction rate

(0.43 turtles/day fished) was in waters south of 37° N during November to June in waters over 50 m deep. The most estimated interactions occurred in the Mid-Atlantic region north of 39° N, during July to October in waters under 50 m deep. In each stratum, interaction rates for non-loggerhead species were lower than rates for loggerheads (Murray 2020).

Based on Murray (2020)⁸, from 2014-2018, 571 loggerhead (CV=0.29, 95% CI=318-997), 46 Kemp's ridley (CV=0.45, 95% CI=10-88), 20 leatherback (CV=0.72, 95% CI=0-50), and 16 green (CV=0.73, 95% CI=0-44) sea turtle interactions were estimated to have occurred in bottom trawl gear in the Mid-Atlantic region over the five-year period. At Georges Bank, 12 loggerheads (CV=0.70, 95% CI=0-31) and 6 leatherback (CV=1.0, 95% CI=0-20) interactions were estimated to have occurred from 2014-2018. An estimated 272 loggerhead, 23 Kemp's ridley, 13 leatherback, and 8 green sea turtle interactions resulted in mortality over this period (Murray 2020).

Gillnet Gear. Interactions between sink gillnet gear and green, Kemp's ridley, loggerhead, and leatherback sea turtles have been observed in the GAR since 1989 (NMFS NEFSC observer/sea sampling database, unpublished data). Specifically, sea turtle interactions with gillnet gear have been observed in the GOM, Georges Bank, and/or the Mid-Atlantic; however, most of the observed interactions have been observed south of the GOM (Murray 2009a; b; 2013; 2018; NMFS 2021a; NMFS NEFSC observer/sea sampling database, unpublished data). As few sea turtle interactions have been observed in the GOM, there is insufficient data available to conduct a robust model-based analysis and bycatch estimate of sea turtle interactions with sink gillnet gear in this region. As a result, the bycatch estimates and discussion below are for sink gillnet gear in the Mid-Atlantic and Georges Bank.

From 2012-2016, Murray (2018) estimated that sink gillnet fisheries in the Mid-Atlantic and Georges Bank⁹ bycaught 705 loggerheads (CV=0.29, 95% CI over all years: 335-1116), 145 Kemp's ridleys (CV=0.43, 95% CI over all years: 44-292), 27 leatherbacks (CV=0.71, 95% CI over all years 0-68), and 112 unidentified hard-shelled turtles (CV=0.37, 95% CI over all years: 64-321).¹⁰ Of these, mortalities were estimated at 557 loggerheads, 115 Kemp's ridley, 21 leatherbacks, and 88 unidentified hard-shelled sea turtles. Total estimated loggerhead bycatch was equivalent to 19 adults. The highest bycatch rate of loggerheads occurred in the southern Mid-Atlantic stratum ($\leq 37^\circ\text{N}$ to 34°N) in large mesh (≥ 7 inches) gear during November to June. Though only one sea turtle was observed in this stratum, observed effort was low, leading to a high bycatch rate. Bycatch rates of all other species were lower relative to loggerheads. Highest estimated loggerhead bycatch occurred in the northern mid-Atlantic ($>37^\circ\text{N}$ to the Georges Bank boundary) from July to October in large mesh gears due to the higher levels of commercial effort in the stratum. Mean loggerhead bycatch rates were ten times those of Kemp's ridley bycatch rates in large mesh gear in the northern Mid-Atlantic from July to October (Murray 2018). Although interactions between sink gillnet gear and green sea turtles have been observed (NEFSC observer/sea sampling database, unpublished data); green sea turtles were excluded from the bycatch rate

⁸ Murray (2020) estimated interaction rates for each sea turtle species with stratified ratio estimators. This method differs from previous approaches (Murray 2008; 2015; Warden 2011a; b), where rates were estimated using generalized additive models (GAMs). Ratio estimator results may be like those using GAM or generalized linear models (GLM) if ratio estimators are stratified based on the same explanatory variables in a GAM or GLM model (Murray 2007; Murray & Orphanides 2013; Orphanides 2010).

⁹ The boundaries of the Mid-Atlantic and Georges Bank were defined by Ecological Production Units (Murray 2018).

¹⁰ Murray (2018) estimated interaction rates for each sea turtle species with stratified ratio estimators. This method differs from previous approaches Murray (2009a); (2013), where rates were estimated using GAMs. Ratio estimator results may be like to those using GAM or GLM if ratio estimators are stratified based on the same explanatory variables in a GAM or GLM model (Murray 2007; Murray & Orphanides 2013; Orphanides 2010).

calculations in Murray (2018) because the observed interaction occurred in waters of North Carolina, and therefore, outside the study region.

Updates to Murray (2018) were recently issued by Murray (2023). From 2017-2021¹¹, Murray (2023) estimated that sink gillnet fisheries operating from Maine to North Carolina¹² bycaught 142 loggerheads (CV=0.89, 95% CI over all years: 15-376), 91 Kemp's ridleys (CV=0.62, 95% CI over all years: 0-218), 49 greens (CV=1.01, 95% CI over all years: 0-177), 26 leatherbacks (CV=0.98, 95% CI over all years: 0-79), and 32 unidentified hard-shelled turtles (CV=0.59, 95% CI over all years: 0-75). Of these interactions, mortalities were estimated at 88 loggerheads, 56 Kemp's ridley, 30 greens, 16 leatherbacks, and 20 unidentified hard-shelled sea turtles. Total estimated loggerhead bycatch was equivalent to 2.5 adults. The highest interaction rate of loggerhead sea turtles occurred in the northern Mid-Atlantic (>37°N to the Georges Bank boundary) from July to October in large mesh gears (≥ 7 inches); relative to loggerheads, interaction rates were lower for all other sea turtle species.

To reduce the impact of large-mesh gillnet fisheries, primarily monkfish, on endangered and threatened species of sea turtles, NMFS implemented the Mid-Atlantic large mesh gillnet rule in the Exclusive Economic Zone (EEZ) on December 3, 2002 (67 FR 71895); this rule was subsequently revised on April 26, 2006 (71 FR 24776). The Mid-Atlantic large mesh gillnet rule establishes seasonally adjusted gear restrictions by closing portions of the Mid-Atlantic EEZ to fishing with gillnets with a mesh size ≥ 7 -inch (17.8-cm) stretched mesh to protect sea turtles. NMFS has also conducted and funded studies to investigate whether low-profile gillnet gear configurations reduce the bycatch of sea turtles in the monkfish fishery (He and Jones 2013; Usher 2018; Galvez *et al.* 2022). Of these studies, Galvez *et al.* (2022) concluded that their low-profile gillnet configuration significantly reduced turtle catch compared to the standard gillnet typically used in the Mid-Atlantic monkfish fishery. The results of the other studies were inconclusive because no sea turtles were captured (He and Jones 2013), and a storm that occurred during the study period was believed to have affected the results and confounded the statistical analysis (Usher 2018).

5.3.5.2 Atlantic Sturgeon

Sink gillnet and bottom trawl gear. The ASMFC (2017a), Miller and Shepard (2011), NMFS (2021a), Boucher and Curti (2023) and the most recent ten years of NMFS observer data (i.e., 2013-2022; NMFS NEFSC observer/sea sampling database, unpublished data) describe the observed or documented interactions between Atlantic sturgeon and bottom trawl and gillnet gear in the GAR. For sink gillnets, higher levels of Atlantic sturgeon bycatch have been associated with depths under 40 m, mesh sizes over ten inches, and the months of April and May ASMFC (2007). For otter trawl fisheries, the highest incidence of Atlantic sturgeon bycatch has been associated with depths under 30 m. More recently, over all gears and observer programs that have encountered Atlantic sturgeon, the distribution of haul depths on observed hauls that caught Atlantic sturgeon was significantly different from those that did not encounter Atlantic sturgeon, with Atlantic sturgeon encountered primarily at depths under 20 m (ASMFC 2017a).

¹¹ Due to the COVID 19 pandemic, observer coverage rates were greatly reduced in 2020 and 2021. Murray (2023) determined that estimated interactions derived from a 3-year time series (2017-2019) did not differ significantly from those derived from the 5-year time series (2017-2021), suggesting that reduced and uneven observer monitoring in 2020 and 2021 did not bias the results using the longer time series. As a result, observer data from 2017-2019 was used to estimate sea turtle interaction rates, confidence intervals, and CVs for the 2017-2021 time series.

¹² Murray (2023) defined this range as the boundaries of the Gulf of Maine, Georges Bank, and Mid-Atlantic Ecological Production Units.

Boucher and Curti (2023) updated the estimate of Atlantic sturgeon bycatch that was presented in the ASMFC (2017a) Atlantic sturgeon benchmark stock assessment for the annual Atlantic sturgeon interactions in fishing gear (e.g., otter trawl, gillnet). The assessment analyzed fishery observer and VTR data to estimate Atlantic sturgeon interactions in fishing gear in the Mid-Atlantic and New England regions from 2000-2021 (excluding 2020 due to COVID-related impacts on data collection). The total bycatch of Atlantic sturgeon from bottom otter trawls was between 638-836 fish over 2016-2021 (excluding 2020 due to COVID-related impacts on data collection), while the total bycatch of Atlantic sturgeon from gillnets ranged from 1,031-1,268 fish. The estimated average annual bycatch during 2016-2021 of Atlantic sturgeon in bottom otter trawl gear is 718.4 individuals and in gillnet gear is 1,125.4 individuals. However, the estimate of Atlantic sturgeon bycatch in Boucher and Curti (2023) for 2016-2021 includes take of all Atlantic sturgeon, including non-listed fish that originate in Canadian waters but occur within the affected environment of this action. Partitioning out the fish that were likely of Canadian origin, NOAA fisheries concluded that the total bycatch of ESA-listed Atlantic sturgeon, only, during 2016-2021 in bottom otter trawl gear is 712 individuals and in gillnet gear is 1,115 individuals.

5.3.5.3 Atlantic Salmon

Sink gillnet and bottom trawl gear. Atlantic salmon are at risk of interacting with bottom trawl or gillnet gear (Kocik *et al.* 2014; NMFS 2021a; NEFSC observer/sea sampling database, unpublished data). Northeast Fisheries Observer Program (NEFOP) data from 1989-2022 show records of incidental bycatch of Atlantic salmon in seven of the 31 years, with a total of 15 individuals caught, nearly half of which (seven) occurred in 1992 (NMFS NEFSC observer/sea sampling database, unpublished data).¹³ Of the observed incidentally caught Atlantic salmon, ten were listed as “discarded,” which is assumed to be a live discard (Kocik, pers comm.; February 11, 2013). Five of the 15 were documented as lethal interactions. The incidental takes of Atlantic salmon occurred in bottom otter trawls (4) and gillnets (11). Observed captures occurred in March (2), April (2), May (1), June (3), August (1), and November (6). Given the very low number of observed Atlantic salmon interactions in gillnet and bottom trawl gear, interactions with these gear types are believed to be rare in the GAR.

5.3.5.4 Giant Manta Ray

Sink gillnet and bottom trawl gear. Giant manta rays are potentially susceptible to capture by bottom trawl and gillnet gear based on records of their capture in fisheries using these gear types (NMFS 2021a; NMFS NEFSC observer/sea sampling database, unpublished data). The most recent 10 years of NEFOP data show that between 2013-2022, one giant manta ray and five unidentified *Mobulidae* were observed in bottom trawl gear and two were observed in gillnet gear (NMFS NEFSC observer/sea sampling database, unpublished data). Also, all the giant manta ray interactions in gillnet or trawl gear recorded in the NEFOP database (13 in 2001-2022) indicate the animals were encountered alive and released alive. However, details about specific conditions such as injuries, damage, time out of water, how the animal was moved or released, or behavior on release is not always recorded. While there is no information on post-release survival, NMFS Southeast Gillnet Observer Program observed a range of 0-16 giant manta rays captured per year between 1998 and 2015 and estimated that approximately 89% survived the interaction and release (NMFS reports: <http://www.sefsc.noaa.gov/labs/panama/ob/gillnet.htm>).

5.3.5.5 Marine Mammals

Depending on species, marine mammals have been observed seriously injured or killed in bottom trawl and/or sink gillnet gear. Pursuant to the MMPA, NMFS publishes a List of Fisheries (LOF) annually,

¹³ There is no information available on the genetics of these bycaught Atlantic salmon, so it is not known how many of them were part of the GOM DPS. It is likely that some of these salmon, particularly those caught south of Cape Cod, may have originated from the stocking program in the Connecticut River. Those Atlantic salmon caught north of Cape Cod and/or in the Gulf of Maine are more likely to be from the GOM DPS.

classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injuries and/or mortalities of marine mammals in each fishery (i.e., Category I=frequent; Category II=occasional; Category III=remote likelihood or no known interactions). In the Northwest Atlantic, the 2024 LOF (89 FR 12257, February 16, 2024) categorizes commercial sink gillnet fisheries (Northeast and Mid-Atlantic) as a Category I fishery; and bottom trawl fisheries (Northeast or Mid-Atlantic) as a Category II fishery.

5.3.5.5.1 Large Whales

Bottom Trawl Gear. The most recent 10 years of observer, stranding, and/or baleen whale serious injury and mortality determinations from 2012-2021, and the GAR Marine Animal Incident database shows that there has been one observed or confirmed documented interactions with large whales and bottom trawl gear. In 2020, a humpback whale was anchored/entangled in fishing gear, later identified by NMFS as trawl net. The animal was disentangled by responders from the Atlantic Large Whale Disentanglement Network. The gear was removed and recovered from the animal, and the whale was released alive with non-serious injuries. Additional information on this incident can be found in the 2020 Atlantic Large Whale Entanglement Report and in Henry et al. 2023.

Sink Gillnet Gear. Large whale interactions (entanglements) with fishing gear have been observed and documented in the waters of the Northwest Atlantic.¹⁴ Information available on all interactions (e.g., entanglement, vessel strike, unknown cause) with large whales comes from reports documented in the GARFO Marine Animal Incident Database (unpublished data). The level of information collected for each case varies, but may include details on the animal, gear, and any other information about the interaction (e.g., location, description, etc.). Each case is evaluated using defined criteria to assign the case to an injury/information category using all available information and scientific judgement. In this way, the injury severity and cause of injury/death for the event is evaluated, with serious injury and mortality determinations issued by the NEFSC.¹⁵

Based on the best available information, the greatest entanglement risk to large whales is posed by fixed gear used in trap/pot or sink gillnet fisheries (Hartley et al. 2003; Johnson et al. 2005; Whittingham et al. 2005a,b; Knowlton et al. 2012; NMFS 2021a,b; Hamilton and Kraus 2019; Henry et al. 2014; Henry et al. 2015; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Sharp et al. 2019; Pace et al. 2021; NMFS [Marine Mammal SARs for the Atlantic Region](#)). Specifically, while foraging or transiting, large whales are at risk of becoming entangled in vertical endlines, buoy lines, or groundlines of gillnet and pot/trap gear, and the net panels of gillnet gear that rise into the water column (Baumgartner et al. 2017; Cassoff et al. 2011; Cole and Henry 2013; Hamilton and Kraus 2019; Hartley et al. 2003; Henry et al. 2014; Henry et al. 2015; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Johnson et al. 2005; Kenney and Hartley 2001; Knowlton and Kraus 2001; Knowlton et al. 2012; NMFS 2021a,b; Whittingham et al. 2005a,b; see NMFS [Marine Mammal SARs for the Atlantic Region](#)).¹⁶ Large whale interactions (entanglements) with these features of trap/pot and/or sink gillnet gear may result in the serious injury or mortality to the whale (Angliss and Demaster 1998; Cassoff et al. 2011; Cole and Henry

¹⁴ [NMFS Atlantic Large Whale Entanglement Reports](#): For years prior to 2014, contact David Morin, Large Whale Disentanglement Coordinator, David.Morin@NOAA.gov; GAR Marine Animal Incident Database (unpublished data); [NMFS Marine Mammal Stock Assessment Reports for the Atlantic Region](#); NMFS NEFSC Baleen Whale Serious Injury and Morality Determinations [Reference Documents, Publications](#), or [Technical Memoranda](#); [MMPA List of Fisheries](#); NMFS 2021a,b.

¹⁵ NMFS NEFSC Baleen Whale Serious Injury and Morality Determinations [Reference Documents, Publications](#), or [Technical Memoranda](#).

¹⁶ Through the ALWTRP, regulations have been implemented to reduce the risk of entanglement in in vertical endlines, buoy lines, or groundlines of gillnet and pot/trap gear, and the net panels of gillnet gear. ALWTRP regulations currently in effect are summarized [online](#).

2013; Henry et al. 2014, Henry et al. 2015, Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Knowlton and Kraus 2001, Knowlton et al. 2012; Moore and Van der Hoop 2012; NMFS 2014; NMFS 2021a,b; Pettis et al. 2021; Sharp et al. 2019; van der Hoop et al. 2016; van der Hoop et al. 2017). As many entanglements, and therefore, serious injury or mortality events, go unobserved, and because the gear type, fishery, and/or country of origin for reported entanglement events are often not traceable, the rate of large whale entanglement, and thus, rate of serious injury and mortality due to entanglement, are likely underestimated (Hamilton et al. 2018; Hamilton et al. 2019; Knowlton et al. 2012; NMFS 2021a,b; Pace et al. 2017; Robbins 2009).

As noted above, pursuant to the MMPA, NMFS publishes a LOF annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injurious and mortalities of marine mammals in each fishery. Large whales, in particular humpback, fin, minke, and North Atlantic right whales, are known to interact with Category I and II fisheries in the Northwest Atlantic Ocean. As fin, and North Atlantic right whales are listed as endangered under the ESA, these species are considered strategic stocks under the MMPA. Section 118(f)(1) of the MMPA requires the preparation and implementation of a Take Reduction Plan for any strategic marine mammal stock that interacts with Category I or II fisheries. In response to its obligations under the MMPA, in 1996, NMFS established the Atlantic Large Whale Take Reduction Team (ALWTRT) to develop a plan (Atlantic Large Whale Take Reduction Plan (ALWTRP)) to reduce serious injury to, or mortality of large whales, specifically, humpback, fin, and North Atlantic right whales, due to incidental entanglement in U.S. commercial fishing gear.¹⁷ In 1997, the ALWTRP was implemented; however, since 1997, it has been modified as NMFS and the ALWTRT learn more about why whales become entangled and how fishing practices might be modified to reduce the risk of entanglement. In 2021, adjustments to Plan were implemented and are summarized [online](#).

[The ALWTRP](#) consists of regulatory (e.g., universal gear requirements, modifications, and requirements; area-and season- specific gear modification requirements and restrictions; time/area closures) and non-regulatory measures (e.g., gear research and development, disentanglement, education and outreach) that, in combination, seek to assist in the recovery of North Atlantic right, humpback, and fin whales by addressing and mitigating the risk of entanglement in gear employed by commercial fisheries, specifically trap/pot and gillnet fisheries. The ALWTRP recognizes trap/pot and gillnet Management Areas in Northeast, Mid-Atlantic, and Southeast regions of the U.S, and identifies gear modification requirements and restrictions for Category I and II gillnet and trap/pot fisheries in these regions; these Category I and II fisheries must comply with all regulations of the Plan.¹⁸ Further details of the Plan are at: [the ALWTRP](#).

5.3.5.5.2 Small Cetaceans and Pinnipeds

Sink Gillnet and Bottom Trawl Gear. Small cetaceans and pinnipeds are vulnerable to interactions with sink gillnet and bottom trawl gear.¹⁹ Reviewing marine mammal stock assessment and serious injury reports that cover the most recent 10 years data (i.e., 2011-2020), and the MMPA LOF's covering this time frame (i.e., issued between 2017 and 2023), Table 13 has a list of species that have been observed (incidentally) seriously injured and/or killed by MMPA LOF Category I (frequent interactions) gillnet and/or Category II (occasional interactions) bottom trawl fisheries that operate in the affected environment of the monkfish and spiny dogfish fisheries for this action. Of the species in Table 13, gray

¹⁷ The measures identified in the ALWTRP are also beneficial to the survival of the minke whale, which are also known to be incidentally taken in commercial fishing gear.

¹⁸ The fisheries currently regulated under the ALWTRP include: Northeast/Mid-Atlantic American lobster trap/pot; Atlantic blue crab trap/pot; Atlantic mixed species trap/pot; Northeast sink gillnet; Northeast anchored float gillnet; Northeast drift gillnet; Mid-Atlantic gillnet; Southeastern U.S. Atlantic shark gillnet; and Southeast Atlantic gillnet .

¹⁹ For additional information on small cetacean and pinniped interactions, see: NMFS NEFSC marine mammal serious injury and mortality [Reference Documents](#), [Publications](#), or [Technical Memoranda](#); NMFS [Marine Mammal SARs for the Atlantic Region](#); [MMPA LOF](#).

seals, followed by harbor seals, harbor porpoises, short beaked common dolphins, and harp seals are the most frequently bycaught small cetacean and pinnipeds in sink gillnet gear in the GAR (Hatch & Orphanides 2014; 2015; 2016; Orphanides 2019; 2020; 2021; Orphanides & Hatch 2017; Precoda & Orphanides 2022). In terms of bottom trawl gear, short-beaked common dolphins, Risso's dolphins, Atlantic white-sided dolphins, and gray seals are the most frequently observed bycaught marine mammal species in the GAR, followed by long-finned pilot whales, bottlenose dolphin (offshore), harbor porpoise, harbor seals, and harp seals (Chavez-Rosales *et al.* 2017; Lyssikatos 2015; Lyssikatos & Chavez-Rosales 2022; Lyssikatos *et al.* 2020; 2021).

Table 13. Small cetacean and pinniped species incidentally injured and/or killed by Category I sink gillnet fisheries or Category II bottom trawl fisheries operating in the affected environment of the monkfish fishery and/or the spiny dogfish fishery.

Fishery	Category	Species Incidentally Injured/Killed
Northeast Sink Gillnet	I	Bottlenose dolphin (offshore; Northern Migratory Coastal)
		Harbor porpoise
		Atlantic white sided dolphin
		Short-beaked common dolphin
		Risso's dolphin
		Long-finned pilot whales
		Harbor seal
		Hooded seal
		Gray seal
		Harp seal
Mid-Atlantic Gillnet	I	Bottlenose dolphin (offshore, Northern and Southern Migratory coastal)
		Harbor porpoise
		Short-beaked common dolphin
		Harbor seal
		Hooded seal
		Harp seal
		Gray seal
Northeast Bottom Trawl	II	Harp seal
		Harbor seal
		Gray seal
		Long-finned pilot whales
		Short-beaked common dolphin
		Atlantic white-sided dolphin
		Harbor porpoise
		Bottlenose dolphin (offshore)
		Risso's dolphin
Mid-Atlantic Bottom Trawl	II	White-sided dolphin
		Short-beaked common dolphin
		Risso's dolphin
		Bottlenose dolphin (offshore)

		Gray seal
		Harbor seal
Source: MMPA 2017-2023 LOFs		

To address the high levels of incidental take of harbor porpoise and bottlenose dolphins in sink gillnet fisheries, pursuant to section MMPA Section 118(f)(1), the Harbor Porpoise Take Reduction Plan (HPTRP) and the Bottlenose Dolphin Take Reduction Plan (BDTRP) were developed and implemented for these species.²⁰ Also, due to the incidental mortality and serious injury of small cetaceans, incidental to bottom and midwater trawl fisheries operating in both the Northeast and Mid- Atlantic regions, the Atlantic Trawl Gear Take Reduction Strategy was implemented. More information on each take reduction plan or strategy is at: [NMFS HPTRP](#), [NMFS BDTRP](#), or [NMFS Atlantic Trawl Gear Take Reduction Strategy](#).

5.4 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

The Northeast U.S. Shelf Ecosystem has been described as including the area from the GOM south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream (Sherman *et al.* 1996). The continental slope includes the area east of the shelf, out to a depth of 2,000 m. Four distinct sub-regions comprise the NOAA Fisheries Greater Atlantic Region: the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. Occasionally another sub-region, Southern New England, is described; however, we incorporated discussions of any distinctive features of this area into the sections describing Georges Bank and the Mid-Atlantic Bight.

The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern edge. It is characterized by highly productive, well-mixed waters and strong currents. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, NC. The continental slope begins at the continental shelf break and continues eastward with increasing depth until it becomes the continental rise. It is homogenous, with exceptions at the shelf break, some of the canyons, the Hudson Shelf Valley, and in areas of glacially rafted hard bottom.

Pertinent physical and biological characteristics of each of these sub-regions are described in the Physical and Biological Environment section of Amendment 5 (Section 4.2), along with a short description of the physical features of coastal environments. Monkfish habitats are described in Section 4.4.1 of Amendment 5 and summarized below. Information on the affected physical and biological environments included in Amendment 5 was extracted from Stevenson *et al.* (2004).

5.4.1 Fishing Effects on EFH

A detailed discussion of fishing impacts on EFH is contained in the Affected Environment Section of Amendment 5 to the Monkfish FMP and in the Affected Environment Section 6 of the 2023 Spiny Dogfish Specifications EA (MAFMC 2023). Since monkfish and spiny dogfish EFH has been determined to not be vulnerable to any fishing gear (Stevenson *et al.* 2004), the discussion focuses on gillnet gear that potentially could impact EFH of other fisheries given that is the focus of this action. Discussion in

²⁰ Although the most recent U.S. Atlantic and Gulf of Mexico Marine Mammal SARs (Hayes *et al.* 2022) no longer designates harbor porpoise as a strategic stock, HPTRP regulations are still in place per the mandates provided in Section 118(f)(1).

Monkfish Amendment 5 and the 2023 Spiny Dogfish Specifications EA cites several important peer-reviewed studies in describing the potential biological and physical effects of fishing on various substrates (mud, sand, gravel and rocky substrates). Since gillnets are stationary or static, the gear has been determined to not have an adverse effect on EFH of other species and are, therefore, omitted from further discussion in this section.

5.4.2 Essential Fish Habitat

Section 4.4 of Monkfish Amendment 5 and Section 6 of the 2023 Specifications Environmental Assessment (MAFMC 2023) contain detailed descriptions of monkfish and spiny dogfish EFH, respectively. EFH of other species vulnerable to gillnet, the effect of the monkfish and spiny dogfish fisheries on EFH (monkfish, spiny dogfish, and other species, all life stages), and previous measures to minimize adverse effects of the monkfish and spiny dogfish fisheries on EFH can also be found in those documents.

In summary, monkfish and spiny dogfish EFH have been determined to only be minimally vulnerable to bottom gillnets. Therefore, the effects of the monkfish fishery and other fisheries on monkfish EFH do not require any management action. There are no species or life stages for which EFH is more than minimally vulnerable to bottom gillnets (Stevenson et al., 2004).

5.5 HUMAN COMMUNITIES

MONKFISH FOCUS

Note: Based on fishery differences and public input over the years from affected communities, the two Councils take slightly different approaches in describing the interaction of a fishery and the relevant human communities, so the proceeding monkfish focus and spiny dogfish focus sections differ in formatting.

5.5.1 Permits and Vessels

The Monkfish FMP has [seven types of federal permits](#): six categories of limited access permits (A-D, F, H) and one open access permit (E, Table 14). The number of fishing vessels with limited access monkfish permits has decreased over the past decade, from 670 to 562 (Table 15). Of those vessels, about 35-48% landed over 1 lb of monkfish each year and about 9-20% landed $\geq 10,000$ lb of monkfish. Permit category C and D vessels consistently accounted for the greatest portion of vessels with monkfish permits and landing monkfish (Table 15, Table 16).

Table 14. Monkfish permit categories.

Permit Category		Description
Limited Access	A	DAS permit that <i>does not</i> also have a groundfish or scallop limited access permit (possession limits vary with permit type).
	B	
	C	DAS permit that <i>also</i> has a groundfish or scallop limited access permit (possession limits vary with permit type).
	D	
	F	Seasonal permit for the offshore monkfish fishery .
	H	DAS permit for use in the Southern Fishery Management Area <i>only</i> .
Open Access	E	Open access incidental permit.

Table 15. Fishing vessels with federal monkfish permits, with number of vessels landing over 1 lb and 10,000 lb, FY 2012-2021.

Permit Category	2012			2015			2018			2021		
	All	>1lb	>10K lb	All	>1lb	>10K lb	All	>1lb	>10K lb	All	>1lb	>10K lb
A	22	6	4	22	4	*	20	*	*	18	8	6
B	44	9	5	42	4	*	38	6	4	38	19	15
C	295	148	60	267	128	30	268	110	30	255	114	42
D	292	94	28	242	59	10	226	77	18	229	115	50
F	9	6	4	17	9	*	17	14	4	14	13	0
H	8	5	4	8	6	5	7	6	3	8	*	0
Total LA	670	268	105	598	210	51	576	214	60	562	270	113
E	1,743	338	19	1,578	247	8	1,525	247	20	1,485	176	7

Source: GARFO Permit database and DMIS as of April 2022.

Table 16. Proportion of monkfish landings by permit category to total monkfish landings in the year, FY 2012-2021.

Permit Category	2012	2015	2018	2021
A and B	15%	13%	16%	12%
C and D	75%	80%	77%	83%
F	2%	2%	1%	>1%
H	1%	1%	1%	0%
E	7%	5%	5%	4%
All	100%	100%	100%	100%

Source: GARFO Permit database and DMIS as of April 2022.

5.5.2 Catch and Landings

From FY 2017-2021, the ACL was exceeded in the NFMA twice and never in the SFMA (Table 17). Commercial landings made up 77-90% of total catch in the NFMA and 30-59% in the SFMA. State landings, defined as vessels that have never had a federal fishing permit, consistently make up under 0.5% of catch. Recreational catch is consistently under 3% of catch. In the NFMA, discards were 9% of catch in FY 2017 and increased to 28% and lowered to 20% and 19% of catch in FY 2018-2020; discards were similar in FY 2021 (21%). In the SFMA, discards were higher in FY 2017-2019 (41-43%) but lowered to 13% in FY 2020 and increased to 27% in FY 2021.

Table 17. Year-end monkfish annual catch limit (ACL) accounting, FY 2017-2021.

Catch accounting element	Pounds	Metric tons	% of ACL
FY 2017			
Northern Fishery Management Area (ACL = 7,592 mt)			
Commercial landings	15,003,103	6,805	89.6%
State-permitted only vessel landings	60,031	27	0.4%
Estimated discards	1,567,883	711	9.4%
Recreational catch (MRIP landings and discards)	11,725	5.3	0.1%
Total Northern monkfish catch	16,642,742	7,549	99.4%
Southern Fishery Management Area (ACL = 12,316 mt)			
Commercial landings	8,392,979	3,807	30.9%
State-permitted only vessel landings	66,936	30	0.2%
Estimated discards	11,531,614	5,231	42.5%
Recreational catch (MRIP landings and discards)	1,627	1	0.0%
Total Southern monkfish catch	19,993,156	9,068	73.6%
FY 2018			
Northern Fishery Management Area (ACL = 7,592 mt)			
Commercial landings	13,237,011	6,004	79.1%
State-permitted only vessel landings	37,468	17	0.2%
Estimated discards	4,666,815	2,117	27.9%
Recreational catch (MRIP landings and discards)	6,977	3	0.0%
Total Northern monkfish catch	17,948,271	8,141	107.2%
Southern Fishery Management Area (ACL = 12,316 mt)			
Commercial landings	10,133,407	4,596	37.3%
State-permitted only vessel landings	64,841	29	0.2%
Estimated discards	11,505,833	5,219	42.4%
Recreational catch (MRIP landings and discards)	742,988	337	2.7%
Total Southern monkfish catch	22,447,069	10,181	82.7%
FY 2019			
Northern Fishery Management Area (ACL = 7,592 mt)			
Commercial landings	13,673,898	6,202	81.7%
State-permitted only vessel landings	16,474	7	0.1%

Estimated discards	3,418,346	1,551	20.4%
Recreational catch (MRIP landings and discards)	164,771	75	1.0%
Total Northern monkfish catch	17,273,489	7,835	103.2%
Southern Fishery Management Area (ACL = 12,316 mt)			
Commercial landings	8,236,922	3,736	30.3%
State-permitted only vessel landings	66,673	30	0.2%
Estimated discards	11,174,259	5,069	41.2%
Recreational catch (MRIP landings and discards)	11,410	5	0.0%
Total Southern monkfish catch	19,489,264	8,840	71.7%
FY 2020			
Northern Fishery Management Area (ACL = 8,351 mt)			
Commercial landings	11,684,519	5,300	63.5%
State-permitted only vessel landings	13,416	6	0.1%
Estimated discards	3,503,282	1,589	19.0%
Recreational catch (MRIP landings and discards)	23,077	10	0.1%
Total Northern monkfish catch	15,224,294	6,905	82.7%
Southern Fishery Management Area (ACL = 12,316 mt)			
Commercial landings	4,944,794	2,243	18.2%
State-permitted only vessel landings	20,749	9	0.1%
Estimated discards	3,078,040	1,396	11.3%
Recreational catch (MRIP landings and discards)	359,987	163	1.3%
Total Southern monkfish catch	8,453,570	3,834	31.1%
FY 2021			
Northern Fishery Management Area (ACL = 8,351 mt)			
Commercial landings	11,496,640	5,215	62.4%
State-permitted only vessel landings	18,511	8	0.1%
Estimated discards	3,857,341	1,750	21.0%
Recreational catch (MRIP landings and discards)	7	0	0.0%
Total Northern monkfish catch	15,372,499	6,973	83.5%
Southern Fishery Management Area (ACL = 12,316 mt)			
Commercial landings	4,338,159	1,968	16.0%
State-permitted only vessel landings	32,185	15	0.1%
Estimated discards	7,278,106	3,301	26.8%
Recreational catch (MRIP landings and discards)	30,056	14	0.1%
Total Southern monkfish catch	11,678,506	5,298	43.0%
Notes: "Commercial landings" includes all monkfish landings by vessels with a permit number over zero, RSA landings, and party/charter landings sold to a federal dealer. "State-permitted only vessel landings" are landings from vessels that never had a federal fishing permit (so the permit #=0).			

“Recreational catch” includes landings and discards from party charter vessels and private anglers, not sold to a federal dealer.

Source: Commercial fisheries dealer and Northeast Fishery Observer Program databases; FY 2017 data accessed 10/2018; FY 2018 accessed 3/2020; FY 2019 accessed 3/2021; FY 2020 accessed 4/22; Marine Recreational Information Program database.

Landings

Landings since FY 2016 have been higher in the NFMA than in the SFMA. The NFMA has had a higher TAL and higher possession limits relative to the SFMA (Table 18). Landings relative to TAL in the NFMA have been between 80-107% since FY 2016, which could be a combination of revised management measures (possession limits) and the large 2015-year class. The NFMA TAL was increased by 10% for FY 2020-2022 (relative to FY 2017-2019) and the individuals from the 2015-year class have grown large enough to be retained by the fishery and are less likely to be discarded because of minimum size regulations. The landings relative to TAL in the SFMA have been lower than the NFMA, between 39-51% since FY 2016.

Table 18. Recent landings (whole/live weight, mt) in the NFMA and SFMA compared to target TAL.

Fishing Year	Northern Area			Southern Area		
	TAL (mt)	Landings (mt)	Percent of TAL achieved	TAL (mt)	Landings (mt)	Percent of TAL achieved
2014	5,854	3,403	58%	8,925	5,415	61%
2015	5,854	4,080	70%	8,825	4,733	53%
2016	5,854	5,447	93%	8,925	4,345	49%
2017	6,338	6,807	107%	9,011	3,802	42%
2018	6,338	6,168	97%	9,011	4,600	51%
2019	6,338	6,211	98%	9,011	3,785	42%
2020	6,624	5,299	80%	5,882	2,294	39%
2021	6,624	5,228	79%	5,882	1,982	34%
2022	6,624	5,186	78%	5,882	1,762	30%
*2023	5,309	4,961	93.45%	3,481	905	26%

*Data as of April 18, 2024.

Landings values are different than the annual catch limit accounting in Table 17 because these are the landings as of April 30 each year. Includes RSA landings.

Source: GARFO quota monitoring [data](#), accessed 4/23/2024.

FY 2021 landings. In FY 2021, 79% of the FY 2021 TAL was landed in the northern area and 34% in the southern area. In the NFMA, monthly landings were lower in May-November 2021 relative to December-March (312-417 mt/month vs. 501-654 mt/month). Otter trawls accounted for 63% of the FY 2021 landings. In the SFMA, monthly landings were highest in May and June 2021 (439-535 mt/month), then dropped to a low in July-November (9-59 mt/month), then were moderate since December (117-227 mt/month). These data and additional information can be found at GARFO’s Quota Monitoring website: <https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports/monkfish/mul.htm>.

Landings and discards by gear type. The northern and southern areas have distinctions in terms of gear type. Since at least 1980, monkfish landings in the NFMA have largely been by vessels using trawls (NEFMC 2022b), 84% on average since 2012 (Table 19). In the SFMA, landings were primarily by

vessels using dredges and trawls from 1980 to the early 1990s. Through the 1990s and to today, gillnets have been the predominant gear for vessels landing monkfish, 72% on average since 2012.

Discards have traditionally been higher in the SFMA relative to the NFMA, and since 2017, southern essential discards have approximated landings, exceeding landings in 2020 (Table 20). In the NFMA, discards have been primarily with otter trawl gear (64%), followed by scallop dredges (29%), and gillnets (7%) over the last 10 years. In the SFMA, discards have been primarily with scallop dredges (78%), followed by otter trawl (16%), and gillnets (6%).

Table 19. Landings by gear type (mt), CY 2012-2021.

Calendar Year	Gillnet		Otter trawl		Scallop Dredge		Total ^a
Northern Fishery Management Area							
2012	359	9%	3,561	87%	135	3%	4,081
2013	424	13%	2,813	84%	114	3%	3,355
2014	424	12%	2,958	86%	36	1%	3,434
2015	678	17%	3,277	80%	100	2%	4,086
2016	629	13%	3,949	84%	111	2%	4,723
2017	984	14%	6,044	85%	44	1%	7,105
2018	870	14%	4,958	83%	153	3%	6,009
2019	1,029	17%	4,950	81%	53	1%	6,084
2020	554	10%	5,020	90%	11	0%	5,587
2021	961	19%	4,122	80%	20	0%	5,121
Annual average	691	14%	4,165	84%	78	2%	4,959
Southern Fishery Management Area							
2012	3,614	64%	1,144	20%	766	14%	5,674
2013	3,394	65%	1,115	21%	627	12%	5,207
2014	3,139	62%	1,029	20%	899	18%	5,099
2015	3,293	72%	674	15%	542	12%	4,550
2016	3,247	75%	577	13%	372	9%	4,331
2017	2,773	73%	547	14%	418	11%	3,796
2018	3,346	76%	497	11%	486	11%	4,388
2019	3,526	81%	357	8%	260	6%	4,373
2020	1,956	75%	387	15%	190	7%	2,593
2021	1,530	76%	300	15%	150	7%	2,005
Annual Average	2,982	72%	663	15%	471	11%	4,202
Source: Deroba (2022).							
^a The total column includes landings from other minor gear types.							

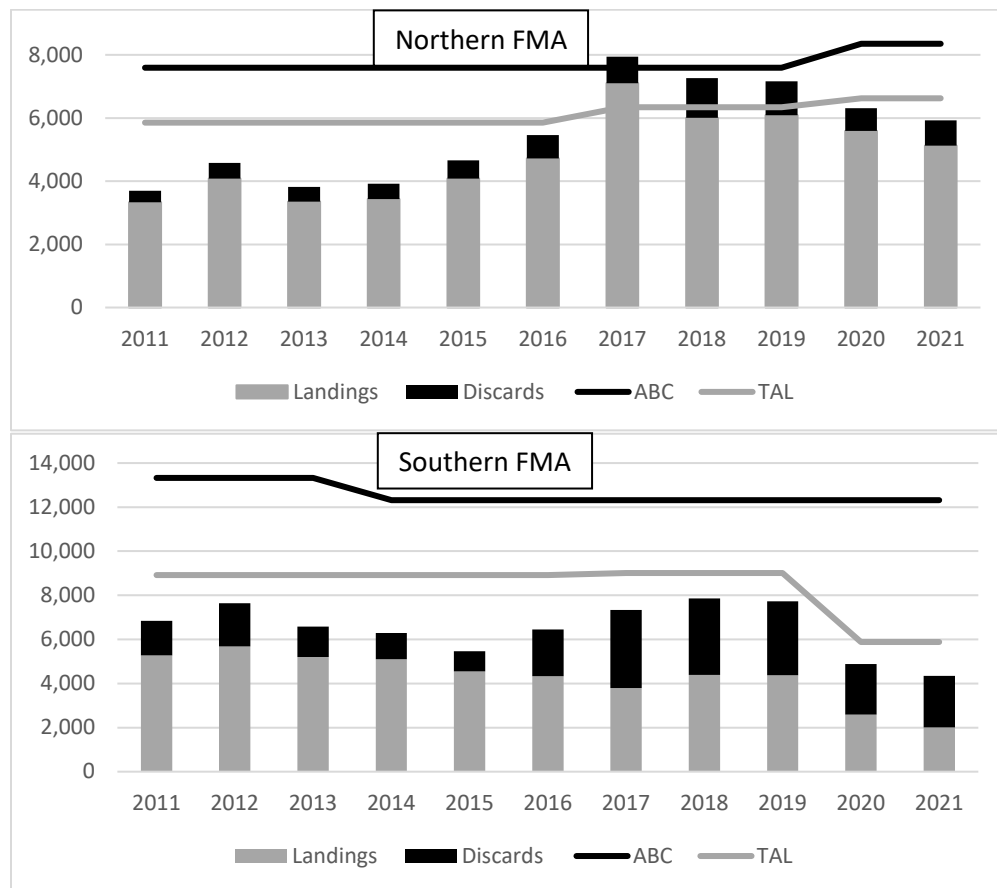
Table 20. Discards by gear type (mt), CY 2012-2021.

Calendar Year	Gillnet		Otter trawl		Scallop Dredge		Total
Northern Fishery Management Area							
2012	20	4%	233	47%	240	49%	493
2013	32	7%	300	65%	127	28%	459
2014	27	6%	384	79%	73	15%	484
2015	42	7%	462	81%	68	12%	572
2016	56	8%	483	66%	195	27%	734
2017	31	4%	712	85%	96	11%	840
2018	66	5%	404	32%	783	62%	1,253
2019	54	5%	512	47%	514	48%	1,080
2020	109	15%	528	73%	85	12%	723
2021	62	8%	500	62%	240	30%	802
Annual average	50	7%	452	64%	242	29%	744
Southern Fishery Management Area							
2012	192	10%	187	10%	1,583	81%	1,962
2013	236	17%	106	8%	1,030	75%	1,372
2014	151	13%	143	12%	893	75%	1,188
2015	73	8%	262	29%	583	64%	919
2016	87	4%	552	26%	1,475	70%	2,114
2017	116	3%	581	16%	2,847	80%	3,544
2018	142	4%	398	11%	2,936	84%	3,476
2019	172	5%	456	14%	2,730	81%	3,358
2020	82	4%	722	31%	1,491	65%	2,295
2021	67	3%	127	5%	2,147	92%	2,340
Annual Average	132	6%	353	16%	1,772	78%	2,257
Source: Deroba (2022).							

Fishery performance relative to specifications

Fishery catch has largely been below the ACL and landings below TAL since 2011, except for in 2017-2019 (Figure 20, Table 17).

Figure 20. ABC, TAL, landings, and discards (mt), 2011-2021



Note: Landings and discards are calendar year data from the assessment. ABC and TAL are the FY specifications.

5.5.3 Revenue

Monkfish fishery revenue has generally declined in recent years, from \$42.2M in CY 2005 to \$10.3M in CY 2021 (Table 21, not adjusted for inflation). Since at least CY 2011, about half of this revenue is from trips where monkfish was over 50% of total revenue (Table 22). There is a declining number of vessels that had trips where the monkfish revenue was over 50% of total revenue, from 206 in CY 2011 to 76 in CY 2021. CY 2020 and 2021 were particularly low revenue years. On trips where a monkfish DAS was used in FY 2021 (Table 23), 61% of the revenue was from monkfish, 17% from skate, 13% from groundfish, and minor components of the revenue from other species. Monkfish price per live pound has been on a declining trend since 2010, though prices have been increasing within the last year (Figure 21). Seasonally, prices tend to be lower in spring to summer months and higher in fall to winter.

Table 21. Total monkfish revenue, CY 2005 – 2021.

Calendar Year	Revenue	Calendar Year	Revenue
2005	\$42.2M	2014	\$18.7M
2006	\$38.0M	2015	\$19.1M
2007	\$28.9M	2016	\$20.0M
2008	\$27.2M	2017	\$18.4M
2009	\$19.6M	2018	\$14.8M
2010	\$19.2M	2019	\$14.5M
2011	\$26.6M	2020	\$9.3M
2012	\$27.1M	2021	\$10.3M
2013	\$18.7M		

Source: ACCSP data, accessed April 2022.
Note: Revenues not adjusted for inflation.

Table 22. Monkfish revenue and revenue dependence on trips where over 50% of revenue is from monkfish, CY 2011 – 2021.

Calendar Year	Vessels	Monkfish Revenue		Non-Monkfish Revenue		Total Revenue	% Monkfish
		Total	Per vessel	Total	Per vessel		
2011	206	\$16,517,143	\$80,180	\$3,354,458	\$16,284	\$19,871,601	83%
2012	196	\$15,138,030	\$77,235	\$3,339,764	\$17,040	\$18,477,794	82%
2013	164	\$8,994,464	\$54,844	\$2,414,798	\$14,724	\$11,409,262	79%
2014	173	\$9,307,800	\$53,802	\$3,042,854	\$17,589	\$12,350,654	75%
2015	140	\$9,319,537	\$66,568	\$2,286,111	\$16,329	\$11,605,648	80%
2016	127	\$9,654,776	\$76,022	\$1,957,503	\$15,413	\$11,612,280	83%
2017	135	\$9,471,858	\$70,162	\$2,545,266	\$18,854	\$12,017,124	79%
2018	108	\$7,001,537	\$64,829	\$1,660,777	\$15,378	\$8,662,314	81%
2019	96	\$7,021,724	\$73,143	\$1,912,752	\$19,924	\$8,934,476	79%
2020	70	\$2,700,687	\$38,581	\$995,332	\$14,219	\$3,696,019	73%
2021	76	\$3,611,791	\$47,524	\$1,057,492	\$13,914	\$4,669,283	77%

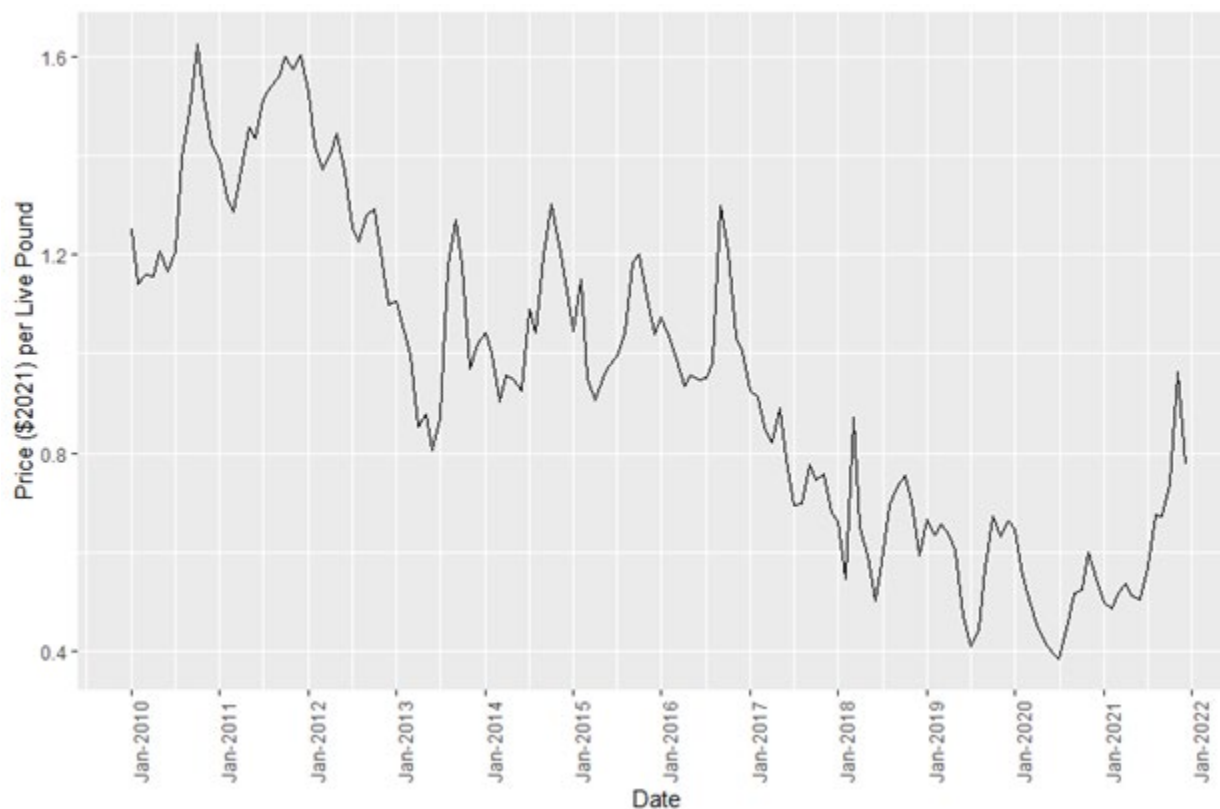
Source: NEFSC SSB. Note: Revenues adjusted to 2021 USD.

Table 23. Landings and revenue dependence from monkfish and other fisheries on trips where a Monkfish DAS was used, FY 2021.

	Live pounds	Revenue	
Monkfish	3,507,169	\$2,464,974	61%
Skate	3,382,423	\$699,805	17%
Groundfish	270,948	\$542,289	13%
Dogfish	75,295	\$21,890	1%
Other	70,806	\$308,774	8%
Total	7,306,641	\$4,037,732	100%

Source: GARFO/APSD, accessed January 2023.
Note: Includes trips where only a monkfish DAS is used and trips where a monkfish DAS and other DAS are used.

Figure 21. Monthly monkfish price (\$2021) per live pounds, 2010 – 2021.



Source: NEFSC SSB, July 2022. Note: Revenues adjusted to 2021 USD.

5.5.4 Fishing Effort

Effort controls such as Days-at-Sea (DAS) and possession limits help ensure that the fishery landings remain within the TAL. Framework 10 established the possession limits and DAS allocations for FY 2017-2019, and these remain unchanged through FY 2022.

5.5.4.1 Day-at-Sea (DAS)

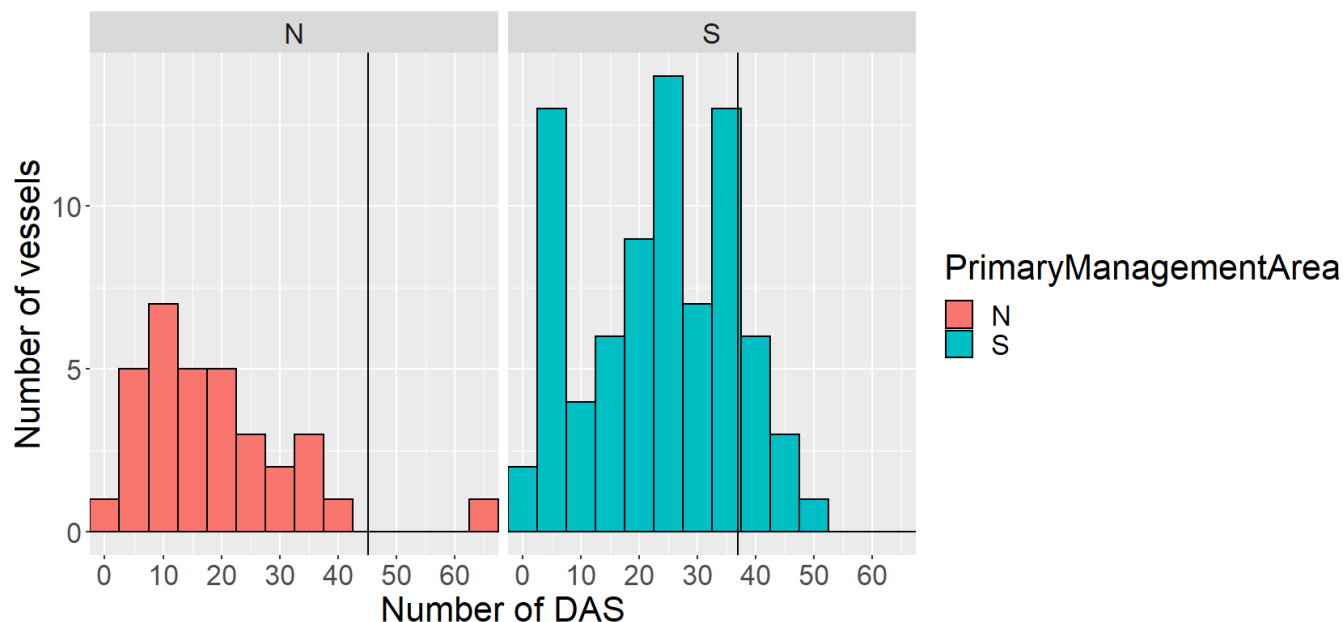
DAS use. DAS allocations have remained the same since FY 2017 ([Framework 10](#)). Limited access vessels are allocated 35 monkfish DAS per fishing year to use in the NFMA and 37 DAS to be used in the SFMA. Additionally, vessels are prohibited from using more than 46 total allocated DAS annually. The number of monkfish DAS used each year is far below what is allocated, suggesting a substantial amount of latent effort in the monkfish fishery. An average of 575 permits were allocated DAS between FY 2019 – 2021, with permit categories C and D accounting for the greatest number of vessels and DAS (Table 24). DAS use varies with permit category. Of the Category A and B permit vessels, 52-64% used at least one DAS in FY 2019-2020, but that decreased to 28-38% in FY 2021. The Category C and D vessels had more stable participation, but was generally lower, 4-18% these past three years.

Table 24. Monkfish DAS usage, combined management areas and all vessels with a limited access monkfish permit, FY 2019 – FY 2021.

Permit Category	All Vessels			Vessels that used ≥ 1 DAS
	Total Vessels	DAS Allocated	DAS Used	
FY 2019				
A	21	909	385	11 (52%)
B	39	1,689	750	25 (64%)
C	273	11,821	583	24 (9%)
D	238	10,305	850	42 (18%)
FY 2020				
A	15	650	193	9 (60%)
B	37	1,602	444	23 (62%)
C	268	11,604	334	17 (6%)
D	229	9,916	490	32 (14%)
FY 2021				
A	18	779	130	5 (28%)
B	37	1,602	280	14 (38%)
C	255	11,042	177	11 (4%)
D	223	9,656	397	24 (11%)
Notes: Permit categories F and H account for a minor number of permits, DAS allocated, and DAS used, thus, are not included in table.				
Data include all vessels with a monkfish limited access permit (i.e., all activity codes).				
Source: NMFS Vessel Permits and Allocation Management System (AMS) databases, accessed March 2022.				

The use of the monkfish DAS allocation varies by vessel and fishing area. In FY 2019 and 2021, vessels that fished primarily in the NFMA used fewer monkfish DAS relative to vessels fishing primarily in the SFMA, despite the 37 DAS use restriction in the SFMA (Figure 22). Some of the vessels fishing primarily in the SFMA vessels exceeded the 37 DAS use restriction, but some of these vessels also took trips in the NFMA, where there is no DAS use restriction. For vessels fishing primarily in the NFMA, one vessel used more than the 45.2 DAS allocated. For primarily SFMA vessels, 12 vessels used more than 37 DAS and 2 used more than 45.2.

Figure 22. Frequency of monkfish DAS use by vessels allocated monkfish DAS, FY 2019 and FY 2021 average.



Notes: Black vertical line represents annual DAS allocations that can be used in the NFMA (45.2) and the SFMA (37). Each vessel was binned into one management area based on where most of its trips occurred.

Source: CAMS database. Accessed October 2022.

FY 2021, 2019 monkfish landings by trip declaration.

Although use of a monkfish DAS is required for landing more than incidental amounts of monkfish, a substantial amount of monkfish landings occur on the incidental trips, particularly in the NFMA. An average of FY 2021 and FY 2019 performance is used to illustrate this. In the NFMA, the most trips and about 86% of the monkfish landings were on trips that did not use a monkfish DAS (Table 25). In the SFMA, vessels using a monkfish DAS accounted for the most trips and 73% of the monkfish landings.

In the NFMA, most of the monkfish landings are on trips using a Northeast (NE) multispecies DAS. Vessels with a Category C and D monkfish permit that also has a limited access NE multispecies DAS permit can declare a monkfish DAS while at sea in the NFMA if they are fishing on a NE multispecies DAS and declare the “monkfish option” prior to leaving port at the start of its trip. When these vessels do not declare a monkfish DAS, their monkfish landings are constrained by a possession limit (900 lb and 750 lb tail weight for Category C and D, respectively, per NE multispecies used; Table 28). If these vessels do select the “monkfish option” while at sea, then they declare and use a monkfish DAS and do not have a monkfish possession limit (unlimited). Trips using a multispecies DAS but not a monkfish DAS accounted for 85% (8.4M lb) of the NFMA monkfish landings, averaged over FY 2019 and FY 2021. Trips using both a NE multispecies and monkfish DAS accounted for >14% (>1.35 M lb) that year. The vessels participating in the Northeast multispecies sector fishery accounted for the greatest amount of monkfish landings.

Besides the NE multispecies fishery, monkfish is landed in other fisheries without a monkfish DAS declaration: declared out of fishery (DOF), scallop, herring, surfclam/ocean quahog/mussel, squid/mackerel/butterfish, and undeclared (Table 25). Out of these fisheries, trips that are DOF or use only a scallop DAS account for the greatest amount of landings.

Table 25. Monkfish landings and total number of vessels and trips by trip declarations (plan code) and DAS used, average across FY 2019 and FY 2021. Orange highlights indicate trips where monkfish was landed without a monkfish DAS.

Declaration/ Plan Code	Program Code Description	DAS used	Whole weight, live lb (mt in parentheses)	# of Vessels	# of Trips
NORTH					
Monkfish	<i>Monkfish Northern Management Area Common Pool Vessel Trip</i>	Monkfish and Northeast Multispecies	C	C	C
	<i>Monkfish Northern Management Area Sector Vessel Trip</i>	Monkfish and Northeast Multispecies	1,347,155 (611)	21	222
	<i>Monkfish Northern Management Area Monkfish-Only Vessel Trip</i>	Monkfish	26,851 (12)	6	20
Northeast Multispecies	<i>Multispecies Common Pool Vessel Trip</i>	Northeast Multispecies	55,255 (25)	5	100
	<i>Multispecies Sector Vessel Trip</i>	Northeast Multispecies	8,289,963 (3,760)	99	2,992
Scallop	<i>Special Access Area</i>	Scallop	43,979 (20)	20	28
	<i>Limited Access General Category</i>	Scallop	17,145 (8)	19	223
	<i>Limited Access</i>	Scallop	12,611 (6)	7	11
Other	<i>Herring; undeclared; surfclam, ocean quahog, mussel; squid, mackerel, butterfish</i>	-	61,447 (28)	22	469
Declared out of Fishery (DOF)		-	10,820 (5)	11	32
NORTH Landings Total			> 9,865,226 (4,475)		

SOUTH					
Monkfish	Monkfish Southern Management Area <u>Common Pool</u> Vessel Trip	Monkfish and Northeast Multispecies	62,203 (28)	5	25
	Monkfish Southern Management Area <u>Sector</u> Vessel Trip	Monkfish and Northeast Multispecies	493,536 (224)	15	178
	Monkfish Southern Management Area <u>Monkfish-Only</u> Vessel Trip	Monkfish	3,200,563 (1,452)	50	1,183
Northeast Multispecies	Multispecies Common Pool Vessel Trip	Northeast Multispecies	50,555 (23)	14	145
	Multispecies Sector Vessel Trip	Northeast Multispecies	100,963 (46)	27	482
Scallop	Special Access Area	Scallop	168,319 (76)	91	210
	Limited Access General Category	Scallop	87,994 (40)	56	986
	Limited Access	Scallop	145,156 (66)	69	106
Other	Herring, undeclared, surfclam/ocean quahog/mussel and squid/mackerel/butterfish	-	575,484 (261)	243	2,195
DOF		-	293,271 (133)	152	2,094
SOUTH Landings Total			5,178,044 (2,349)		
Notes:					
<ul style="list-style-type: none">• C = confidential, < 3 vessels. The ‘Total’ number of vessels is not the sum of the columns but the sum of the unique vessels.• In the “Other” rows, data for undeclared trips include incidental landings, which do not require any declaration.• The total monkfish landings from this table differs slightly from Table 18 likely due to differences in data source (CAMS versus quota monitoring), requirement of having a monkfish permit category associate with monkfish landings in Table 25, and when the data were pulled.• Data do not include RSA trips; DOF includes scientific and other research trips.					
Source: CAMS database. Accessed November 2022.					

5.5.4.2 Possession Limits

There are multiple monkfish possession limits depending on whether the vessel has a limited access or open access incidental monkfish permit, the specific permit category, whether a monkfish DAS is being used, and if so, whether the monkfish DAS is used alone or in combination with DAS for other fisheries (Table 26, Table 27).

Monkfish Possession Limits while on a Monkfish DAS

Table 26. NFMA FY 2020-2022 monkfish limited access possession limits while fishing on a monkfish DAS.

Monkfish Permit Category	Description	FY 2020-2022 Monkfish Possession Limits (lb)	Previous Possession Limits
A	Only monkfish DAS	1,250 lb tail weight 3,638 lb whole weight	No change since at least FY 2011.
B		600 lb tail weight 1,746 lb whole weight	
C	Only monkfish DAS	1,250 lb tail weight 3,638 lb whole weight	
	Monk DAS & NE Mults A or Scallop DAS	Unlimited	FW9 (FY16): eliminated limit; No change since then.
D	Only monkfish DAS	600 lb tail weight 1,746 lb whole weight	No change in since at least FY 2011.
	Monk DAS & NE Mults A or Scallop DAS	Unlimited	FW9 (FY16): eliminated limit; No change since then.

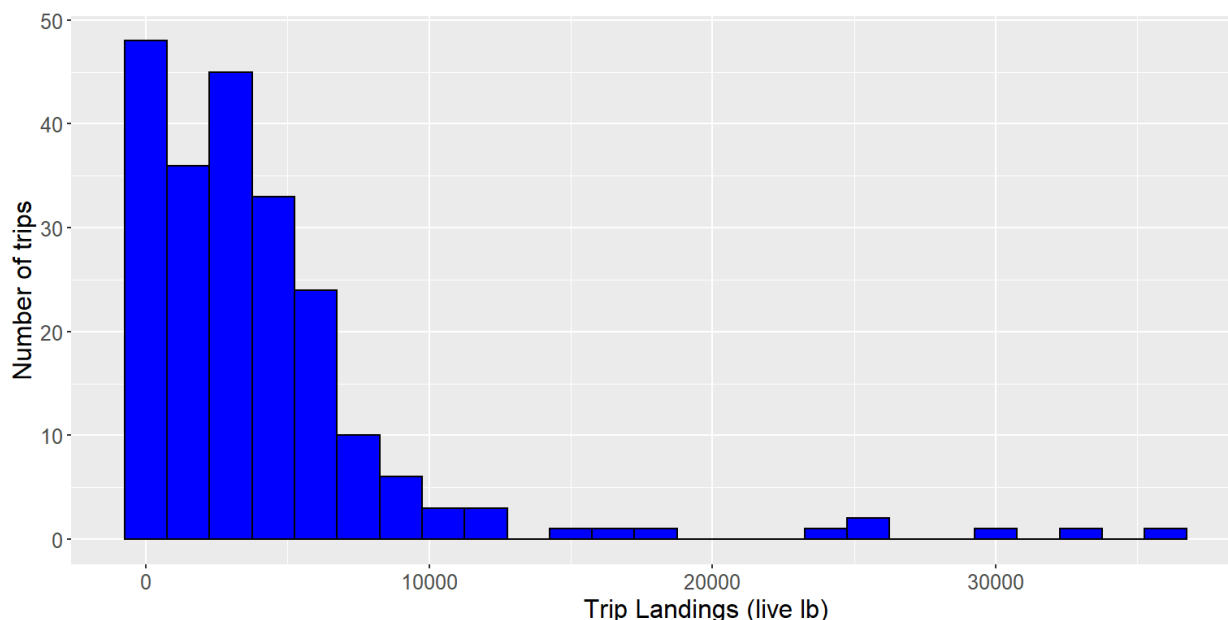
Table 27. SFMA FY 2020-2022 monkfish limited access possession limits while fishing on at least a monkfish DAS.

Monkfish Permit Category	Description	FY 2020-2022 Monkfish Possession Limits (lb)	Previous Possession Limits
A	Only monkfish DAS	700 lb tail weight 2,037 lb whole weight	No change since FY 2017.
B		575 lb tail weight 1,673 lb whole weight	
C	Only monkfish DAS	700 lb tail weight 2,037 lb whole weight	
	Monk DAS & NE Mults A or Scallop DAS	700 lb tail weight 2,037 lb whole weight	
D	Only monkfish DAS	575 lb tail weight 1,673 lb whole weight	
	Monk DAS & NE Mults A or Scallop DAS	700 lb tail weight 2,037 lb whole weight	
F	Seasonal offshore monkfish fishery in SFMA (Oct. 1-April 30)	1,600 lb tail weight 4,656 lb whole weight	No change since at least FY 2011.
H	SFMA only	575 lb tail weight 1,673 lb whole weight	No change since FY 2017.

Vessels that use both a Northeast Multispecies (NE) DAS and a monkfish DAS in the NFMA have an unlimited monkfish possession limit. FY 2021, 16 vessels took at least one trip that used both DAS, taking a total of 208 trips, landing an average of 8,554 lb (whole weight) of monkfish per trip, with a

range from 603 lb to 36,212 lb, whole weight (Figure 23, Table 25). There is no monkfish landing limit for these trips.

Figure 23. Frequency of trip landings while using both a monkfish and Northeast Multispecies DAS, FY 2021.



Source: CAMS database. Accessed October 2022.

Incidental Possession Limits. To land incidental amounts of monkfish from federal waters, vessels must have a federal monkfish permit and not fish on a monkfish DAS. Incidental monkfish can be caught while on a Northeast Multispecies DAS, on a Scallop DAS or in the Sea Scallop Access Area Program, not under a DAS Program, and not under a DAS program that also hold permits in other fisheries/special cases. Incidental possession limits vary by trip type, gear, and management area (Table 28).

Vessels have the flexibility to land over the incidental limit when fishing on a Northeast Multispecies A DAS (e.g., a sector trip) if the vessel fishes only in the NFMA and declares the ‘monkfish option’ on the VMS unit before leaving port. If the vessel “flexes” the monkfish option during the trip (e.g., when landings exceed the incidental limit), then the vessel is charged both a Monkfish and NE Multispecies DAS and this is considered a directed monkfish trip. If the vessel selects the monkfish option prior to leaving port but does not flex on that option, then the vessel can only land incidental amounts of monkfish.

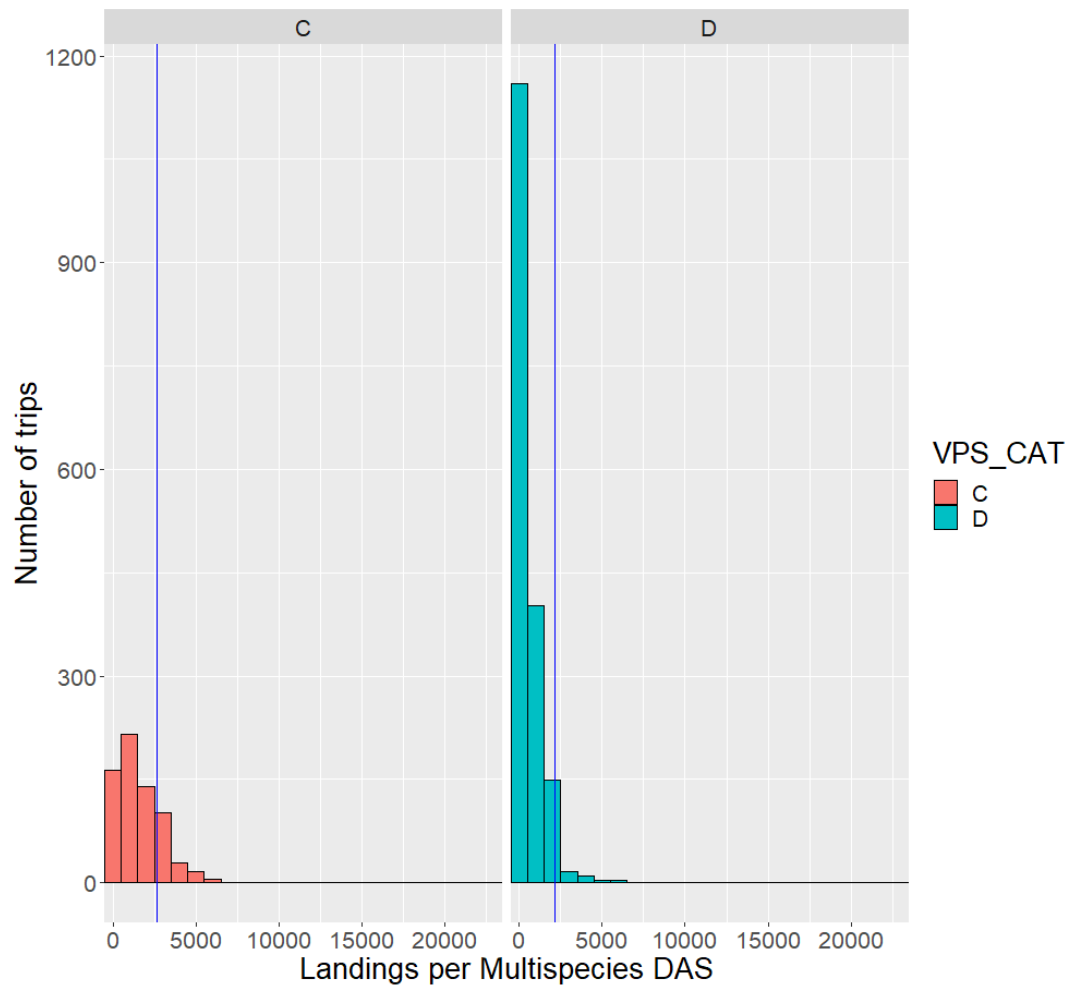
Table 28. Monkfish incidental possession limits by management area, gear, and permit category.

Source: [GARFO](#).

Incidental Possession Limit Category			Management Area	Incidental Possession Limits by gear, permits
While on a NE Multispecies DAS			NFMA	<i>All gear</i> - 900 lb tail weight (2,619 lb whole weight; permit C), 750 lb (2,183 lb whole weight; permit D), up to 300 lb (permits E/F/H)
			SFMA	<i>Non-trawl</i> – 50 lb tail weight for permits C, D, H <i>Trawl</i> – 300 lb tail weight for permits C, D, H
While on a Scallop DAS or in the Sea Scallop Access Area Program			NFMA and SFMA	<i>All gear</i> - 300 lb tail weight
While not under a DAS Program	GOM, GB Reg. Mesh Areas			5% of total fish weight on board
	SNE Reg. Mesh Area			50 lb tail weight/day, up to 150 lb per trip
	MA Exemption Area			5% of total fish weight on board up to 450 lb tail weight
	NFMA or SFMA			50 lb tail weight/day, up to 150 lb per trip
	And fishing under skate bait Letter of Authorization		SNE Reg. Mesh Area	50 lb tail weight/day, up to 150 lb per trip
	And holds permits in other fisheries/special cases	NE Multispecies Small Vessel Permit	NFMA or SFMA	<i>All gear</i> - 50 lb tail weight/day, up to 150 lb per trip
		Surfclam or ocean quahog permit		<i>Hydraulic clam dredge or mahogany quahog dredge</i> - 50 lb tail weight/day, up to 150 lb per trip
		Sea scallop permit		<i>Scallop dredge only</i> - 50 lb tail weight/day, up to 150 lb per trip. <i>If in scallop dredge exemption areas</i> - 50 lb tail weight/trip

In FY 2021, most NFMA monkfish landings were from vessels participating in the NE Multispecies sector program using only a Northeast Multispecies DAS (10.1 M live lb, Table 25). These incidental trips were harvested by vessels using either a monkfish C or D permit category using either trawl or gillnet gear, thus, have incidental limits of 2,619 lb and 2,183 lb whole weight per Northeast Multispecies DAS used (Table 28). The average incidental landings per Multispecies DAS used were 1,638 lb and 573 lb whole weight for permit category C and D, respectively (Figure 24). Most monkfish landings while only on a NE Multispecies DAS were less than the possession limits, however, some trips did exceed these limits (Table 29).

Figure 24. Frequency of monkfish landings per Northeast Multispecies DAS in the NFMA for permit categories C and D, FY 2021.



Notes: Blue vertical lines represent trip possession limits while using a Northeast multispecies DAS in the NFMA (2,619 lb for permit C and 2,183 lb for permit D, whole weight).

RSA trips were removed.

Source: CAMS and discard modules, November 2022.

Table 29. Monkfish landings (lb, whole weight) under and over incidental trip limits while using and not using a Northeast Multispecies DAS, by permit category, FY 2021.

Permit Category	Trips using NE Mult. DAS					Trips <u>not</u> using NE Mult. DAS (undeclared or NE Mult. sector or common pool)*	
	Trips landing < incidental limit		Trips landing > incidental trip limits				
	Total Landings	# Trips	Total Landings	Landings in excess**	# Trips	Total Landings	# Trips
C	5,242,947	620	196,625	49,961	56	1,098,745	251
D	2,171,167	1,674	243,711	59,392	72	877,139	750
TOTAL	7,414,116	2,294	440,336	109,353	128	1,975,884	1,001

Notes: RSA trips were removed from data.

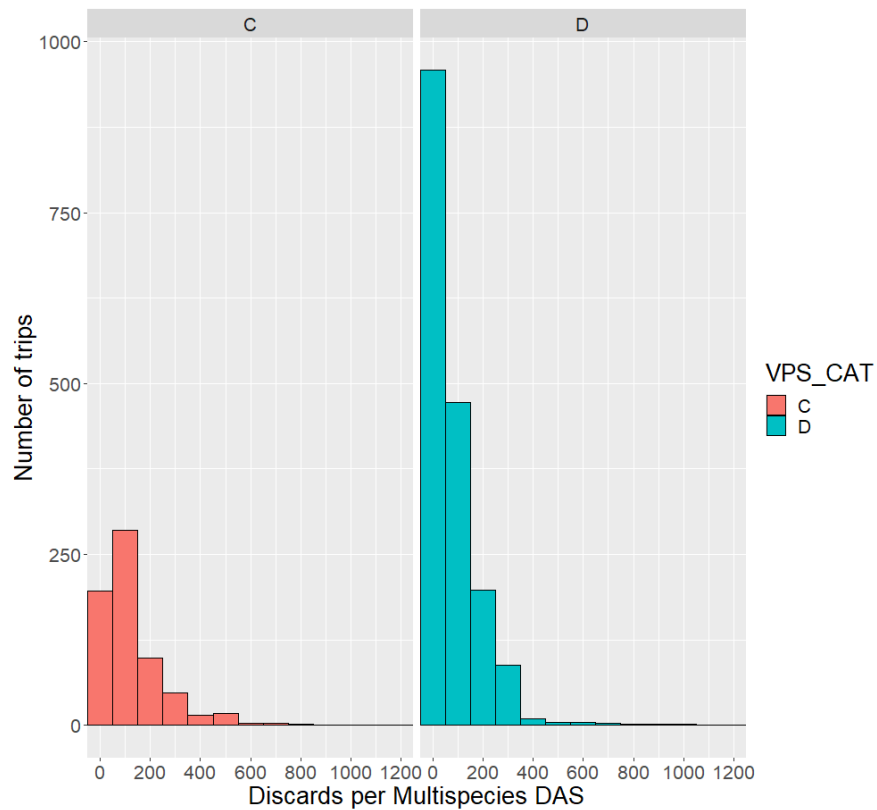
* These are either undeclared or NE Multispecies sector or common pool trips where a DAS is not required. These trips have incidental possession limits (146 lb whole weight per day, not to exceed 437 lb whole weight per trip). ~30% of these trips are landing over the incidental amount, landing 888,504 lb whole weight in excess, but some of these trips are Exempted Fishing Permit trips which have different possession limits.

** Only includes the landings more than the incidental possession limits (i.e., does not include the incidental landings legally allowed).

Source: CAMS and discard modules, November 2022.

When on a NE Multispecies DAS, vessels discarded about 80 to 129 lb (whole weight) per NE Multispecies DAS used, depending on whether a D or C permit category was used, respectively (Figure 25). The amount of discarding appears to increase as landings increase (Figure 26).

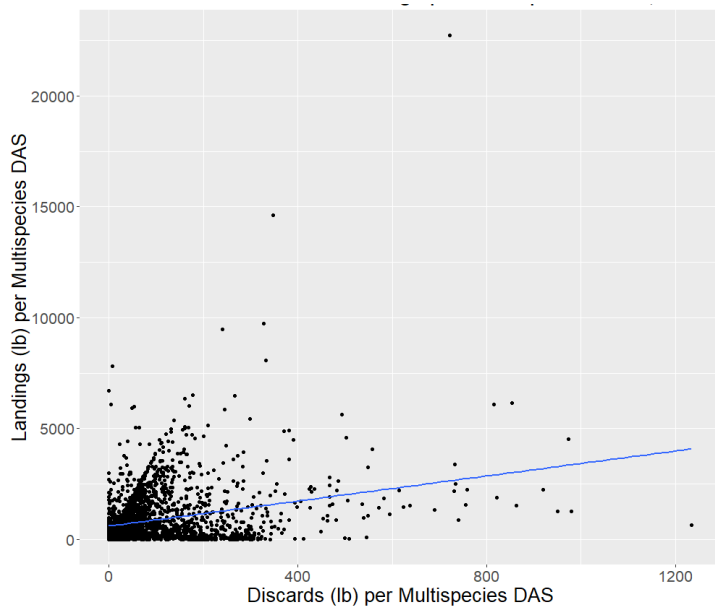
Figure 25. Frequency of trip discards per NE Multispecies DAS, by permit category, FY 2021.



Notes: RSA trips were removed.

Source: CAMS and discard modules, November 2022.

Figure 26. Discards as a function of landings (lb, whole weight), per NE Multispecies DAS in FY 2021.



Notes: RSA trips were removed. Blue line indicates a trend line.

Source: CAMS and discard modules, November 2022.

5.5.5 Fishing Communities

Consideration of the social and economic impacts on fishing communities of proposed fishery regulations is required by the National Environmental Policy Act of 1969, as Amended (NEPA 1969) and the Magnuson-Stevens Fishery Conservation and Management Act, particularly National Standard 8 (MSA 2007) which defines a “fishing community” as “a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community” (16 U.S.C. § 1802(17)). Here, “fishing communities” include communities with a substantial involvement in or dependence on the monkfish fishery.

5.5.5.1 Monkfish Fishing Communities Identified

Primary and secondary monkfish fishing ports are identified for the Monkfish FMP. Based on the criteria below, there are six primary ports in the fishery (Table 30). Of these, the highest revenue ports are New Bedford, Gloucester, and Boston, MA (Table 31). There are 14 secondary ports. The primary and secondary ports comprised 66% and 28% of total fishery revenue, respectively, during 2010-2019. There are 138 other ports that have had more minor participation (6%) in the fishery recently. More community information is available from the NEFSC [Social Sciences Branch website](#) and in Clay et al. (2007).

Primary Port Criteria. The monkfish fishery primary ports are those that are substantially engaged in the fishery. The primary ports meet at least one of the following criteria:

1. At least \$1M average annual revenue of monkfish during 2010-2019, or
2. Ranking of very high (factor score ≥ 5)² for engagement in the monkfish fishery on average in 2016-2020, using the NOAA Fisheries [Community Social Vulnerability Indicators](#) (Table 30).

Secondary Port Criteria. The monkfish fishery secondary ports are involved to a lesser extent. The secondary ports meet at least one of the following criteria:

- At least \$100,000 average annual revenue of monkfish, 2010-2019, or
- A ranking of high (factor score 1-4.99) for engagement in the monkfish fishery on average in 2016-2020, using the NOAA Fisheries [Community Social Vulnerability Indicators](#) (Table 31).

Table 30. Primary and secondary ports in the monkfish fishery.

State	Port	Average revenue 2010-2019		Monkfish Engagement, 2016-2020		Primary/ Secondary
		>\$100K	>\$1M	High	Very High	
ME	Portland	√		√		Secondary
NH	Portsmouth	√		√		Secondary
MA	Gloucester		√		√	Primary
	Boston		√		√	Primary
	Scituate	√		√		Secondary
	Chatham	√		√		Secondary
	Harwichport	√		√		Secondary
	New Bedford		√		√	Primary
	Westport	√		√		Secondary
RI	Little Compton	√		√		Secondary
	Newport	√		√		Secondary
	Narragansett/Point Judith		√		√	Primary
CT	New London	√		√		Secondary
NY	Montauk	√			√	Primary
	Hampton Bays/ Shinnecock	√		√		Secondary
NJ	Point Pleasant	√		√		Secondary
	Barnegat Light/Long Beach		√	√		Primary
	Cape May			√		Secondary
VA	Chincoteague	√				Secondary
	Newport News			√		Secondary

Table 31. Fishing revenue (unadjusted for inflation) and vessels in top Monkfish ports by revenue, calendar years 2010 – 2019.

Port	Average revenue, 2010-2019			Total active monkfish vessels, 2010-2019
	All fisheries	Monkfish only	% Monkfish	
New Bedford, MA	\$368,627,420	\$4,240,639	1%	479
Gloucester, MA	\$48,514,248	\$2,924,748	6%	190
Boston, MA	\$15,999,540	\$1,809,192	11%	44
Pt. Judith, RI	\$47,753,305	\$1,604,760	3%	214
Long Beach, NJ	\$26,124,402	\$1,459,529	6%	74
Chatham, MA	\$11,764,003	\$817,736	7%	57
Little Compton, RI	\$2,398,385	\$802,384	33%	31
Montauk, NY	\$17,192,554	\$726,690	4%	116
Hampton Bay, NY	\$5,746,477	\$578,235	10%	64
Portland, ME	\$24,798,943	\$559,798	2%	71
Other (n=146)	\$368,846,866	\$3,750,338	1%	
Total	\$937,766,141	\$19,274,049	2%	
Source: NMFS Commercial Fisheries Database (AA data), accessed April 2022.				
Note: “Active” defined as landing > 1 lb of monkfish.				

The Engagement Index can be used to determine trends in a fishery over time. Those ports with very high monkfish engagement in 2016-2020, generally had very high engagement in 2006-2010 and 2011-2015, except for Boston, MA, which had increasing engagement over this time (Table 32). There are 14 ports that have had high or very high engagement during all three periods, indicating a stable presence in those communities. Annual data on port engagement is available at the [Commercial Fishing Performance Measures website](http://www.st.nmfs.noaa.gov/humandimensions/social-indicators/index).

Table 32. Changes in monkfish fishery engagement over time for all ports with high engagement during at least one year, 2006 – 2020.

State	Community	Engagement Index			
		2006-2010	2011-2015	2016-2020	2020 only
ME	Portland	High	High	High	High
NH	Portsmouth	High	Med.-High	High	High
MA	Gloucester	Very High	Very High	Very High	Very High
	Boston	High	High	Very High	Very High
	Scituate	High	High	High	High
	Chatham	High	High	High	High
	Harwichport	Medium	Medium	High	High
	New Bedford	Very High	Very High	Very High	Very High
	Westport	Med.-High	High	High	Med.-High
RI	Tiverton	Med.-High	Medium	Medium	Medium
	Little Compton	High	High	High	High
	Newport	High	High	High	High
	Narragansett/Pt. Judith	Very High	Very High	Very High	Very High
CT	Stonington	Med.-High	Med.-High	Med.-High	High
	New London	Med.-High	High	High	High
NY	Montauk	Very High	Very High	Very High	High
	Hampton Bays/Shinnecock	High	High	High	High
NJ	Point Pleasant	High	High	High	High
	Barnegat Light/Long Beach	Very High	Very High	High	High
	Cape May	High	High	High	High
MD	Ocean City	High	High	Med.-High	Med.-High
VA	Chincoteague	High	High	Medium	Medium
	Newport News	Med.-High	High	High	High
NC	Wanchese	High	Med.-High	Med.-High	Med.-High
	Beaufort	Medium	Med.-High	Med.-High	Medium

Source: <http://www.st.nmfs.noaa.gov/humandimensions/social-indicators/index>.

Landings by state

During CY 2012-2021, monkfish were landed in 11 states, mostly in Massachusetts (61%), followed by Rhode Island (13%), and New Jersey (9%, Table 33). Massachusetts continues to account for the greatest proportion of all monkfish landings.

Table 33. Monkfish landings by state, CY 2012 – 2021.

STATE	Monkfish landings (mt)										Total	
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		
ME	488	115	257	345	243	178	219	170	411	442	4,062	4%
NH	57	86	74	38	50	68	123	119	175	213	1,463	2%
MA	5,247	3,812	4,972	4,303	4,227	4,581	5,067	5,943	6,306	6,057	55,961	61%
RI	1,303	1,598	2,122	1,495	1,488	1,819	1,648	1,560	1,412	2,306	11,441	13%
CT	347	305	457	547	724	380	464	275	246	324	2,123	2%
NY	841	766	1,059	1,183	773	748	827	1,193	829	1,005	5,996	7%
NJ	1,003	1,418	1,676	1,389	1,351	1,740	1,250	1,335	1,229	1,205	7,946	9%
DE	0										0	0%
MD	51	83	98	69	86	78	36	51	32	19	285	0%
VA	412	402	638	567	413	352	259	218	88	142	1,748	2%
NC	10	27	10	3	38	47	56	33	36	20	244	0%
Total	9,758	8,612	11,365	9,940	9,394	9,992	9,949	10,897	10,765	11,735	91,271	100%

Source: ACCSP database, accessed April 2022.

5.5.5.2 Social and Gentrification Pressure Vulnerabilities

The NOAA Fisheries Community [Social Indicators](#) (see also Jepson & Colburn 2013) are quantitative measures that describe different facets of social and economic well-being that can shape either an individual's or community's ability to adapt to change. The indicators represent different facets of the concepts of social and gentrification pressure vulnerability to provide context for understanding the vulnerabilities of coastal communities engaged in and/or reliant on commercial fishing activities. Provided here are these indicators for the primary and secondary monkfish ports (Table 34).

Social Vulnerability Indicators. There are five social vulnerability indicators; the variables for which represent different factors that may contribute to a community's vulnerability. The **Labor force structure** index characterizes the strength/weakness and stability/instability of the labor force. The **Housing characteristics** index measures infrastructure vulnerability and includes factors that indicate housing that may be vulnerable to coastal hazards. The **Personal disruption** index represents factors that disrupt a community member's ability to respond to change because of personal circumstances affecting family life such as unemployment or educational level. The **Poverty** index is a commonly used indicator of vulnerable populations. The **Population composition** index shows the presence of populations who are traditionally considered more vulnerable due to circumstances often associated with low incomes and fewer resources. A high rank in any of these indicates a more vulnerable population.

Most monkfish port communities exhibited medium-high to high vulnerability in at least one of the five social vulnerability indicators. Across all monkfish ports, the highest indicator of vulnerability is labor force structure.

Gentrification Pressure Indicators. Gentrification pressure indicators characterize factors that, over time, may indicate a threat to the viability of a commercial or recreational working waterfront, including the displacement of fishing and fishing-related infrastructure. The **Housing Disruption** index represents factors that indicate a fluctuating housing market where some fishing infrastructure displacement may

occur due to rising home values and rents. The **Retiree migration** index characterizes areas with a higher concentration of retirees and elderly people in the population. The **Urban sprawl** index describes areas with increasing population and higher costs of living. A high rank in any of these indicates a population more vulnerable to gentrification.

Almost all monkfish ports scored medium-high to high in at least one of the three gentrification pressure indicators. This suggests that shoreside fishing infrastructure and fishing family homes may face rising property values (and taxes) from an influx of second homes and businesses catering to those new residents, which may displace the working waterfront. Across all monkfish ports, the highest indicator of vulnerability is housing disruption.

Combined Social and Gentrification Pressure Vulnerabilities. Overall, 11 of the 20 communities have medium to high levels of vulnerability for four or more of the eight indicators (combined social and gentrification pressure). This indicates high social and gentrification pressure vulnerability overall for both the primary and secondary communities. New Bedford, MA has six indicators at the medium to high level.

Table 34. Social vulnerability and gentrification pressure in monkfish ports, 2019.

State	Community	Social vulnerability					Gentrification pressure		
		Labor Force Structure	Housing Characteristics	Environmental Justice indicators			Housing Disruption	Retiree Migration	Urban Sprawl
				Personal Disruption	Poverty	Population Composition			
ME	Portland (s)	Low	Medium	Low	Medium	Low	Medium	Low	Medium
NH	Portsmouth (s)	Low	Low	Low	Low	Low	Med-High	Low	Medium
MA	Gloucester (p)	Low	Low	Low	Low	Low	Medium	Low	Medium
	Boston (p)	Low	Low	Medium	Med-High	Med-High	High	Low	High
	Scituate (s)	Low	Low	Low	Low	Low	Med-High	Low	Med-High
	Chatham (s)	High	n/a	Low	Low	Low	High	High	Low
	Harwichport (s)	High	Low	Low	Low	Low	Med-High	High	Low
	New Bedford (p)	Low	Med-High	Med-High	High	Med-High	Medium	Low	Med-High
	Westport (s)	Medium	Medium	Low	Low	Low	Medium	Medium	Medium
RI	Little Compton (s)	Medium	Low	Low	Low	Low	Med-High	Med-High	Medium
	Newport (s)	Low	Low	Low	Medium	Low	High	Low	Medium
	Narragansett/Pt. Judith (p)	Medium	Low	Low	Low	Low	Med-High	Medium	Low
CT	New London (s)	Low	Med-High	High	High	Med-High	Low	Low	Low
NY	Montauk (p)	Med-High	Low	Low	Low	Low	High	High	Med-High
	Hampton Bays/Shinnecock (s)	Low	Low	Low	Low	Med-High	High	Low	Medium
NJ	Point Pleasant (s)	Low	Low	Low	Low	Low	Medium	Low	Medium
	Barnegat Light/Long Beach (p)	High	n/a	Low	Low	Low	High	High	Medium
	Cape May (s)	Med-High	Medium	Low	Low	Low	High	Med-High	Low
VA	Chincoteague (s)	High	Med-High	Medium	Low	Low	Medium	Med-High	Low
	Newport News (s)	Low	Medium	Medium	Medium	Med-High	Low	Low	Low

Source: NOAA Fisheries Community [Social Indicators](#).
 *n/a indicates ranking is not available due to incomplete data. (p) = herring primary port. (s) = herring secondary port

SPINY DOGFISH FOCUS

Note: Based on fishery differences and public input over the years from affected communities, the two Councils take slightly different approaches in describing the interaction of a fishery and the relevant human communities, so the proceeding monkfish focus and spiny dogfish focus sections differ in formatting.

5.5.6 Purpose

This section describes the performance of the spiny dogfish fishery to allow the reader to understand its socio-economic importance. Also see NMFS' communities page at: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/socioeconomics/socioeconomic-cultural-and-policy-research-northeast>.

The most obvious way that human communities are affected by the fishery is from the revenues generated, and the jobs created. The affected communities include both individuals directly involved in harvesting and processing as well as indirect support services (e.g. vessel maintenance, insurance, ice, etc.). While the direct data points that are most available are landings and revenues, it is important to keep in mind that by contributing to the overall functioning of and employment in coastal communities, the fishery has indirect social impacts as well. Social impacts are strongly aligned with changes to fishing opportunities and while difficult to measure can include impacts to families from income changes/volatility, safety-at-sea (related to changes in fishery operations due to regulation changes), job satisfaction, and/or frustration by individuals due to management's impacts (especially if they perceive management actions to be unreasonable or ill-informed).

5.5.7 Recent Fishery Performance

This section establishes a descriptive baseline for the fishery with which to compare actual and predicted future socio-economic changes that result from management actions. The 2023 spiny dogfish Fishery Information Document and 2023 Spiny Dogfish Fishery Performance Report have details on recent commercial fishing activity, summarized below. These are available at <https://www.mafmc.org/dogfish>. There is negligible directed recreational effort/catch.

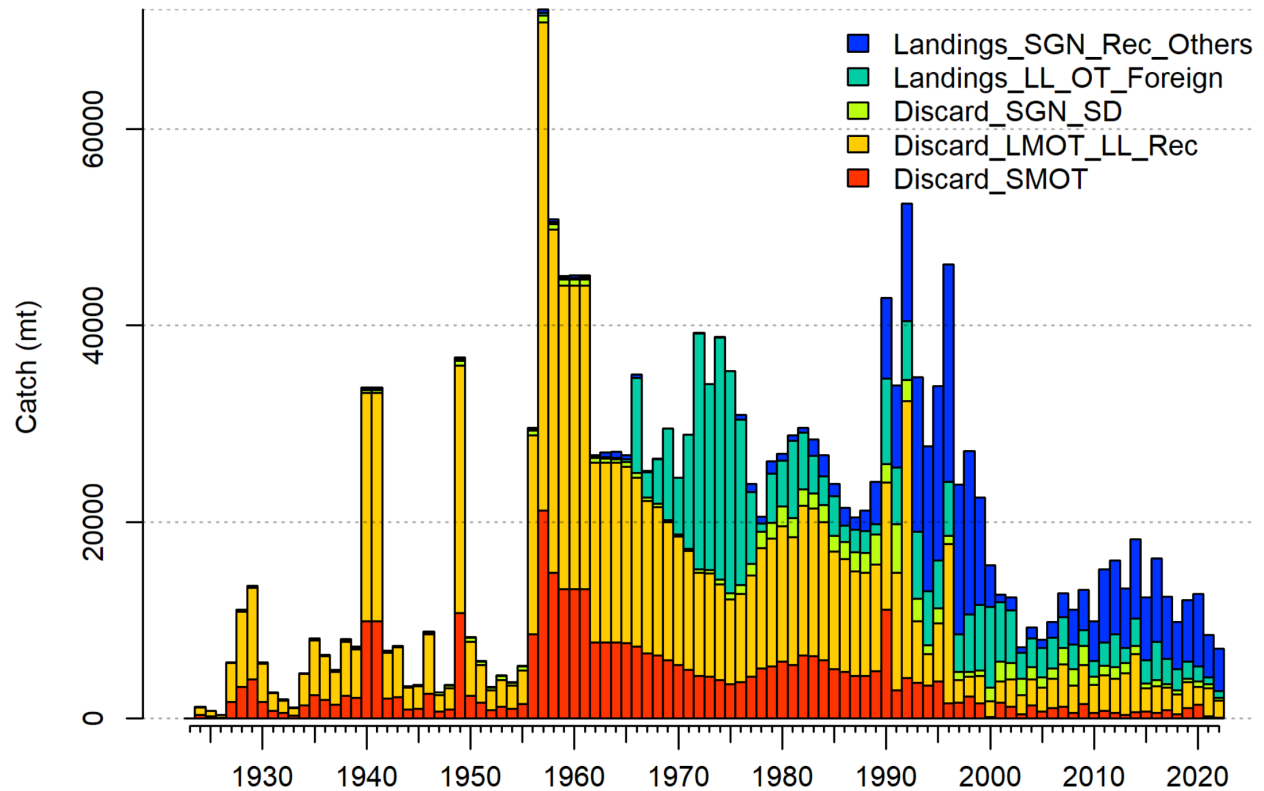
The NEFMC and MAFMC jointly manage spiny dogfish in federal waters (MAFMC has the lead) and the ASMFC has a complementary state waters plan. Directed fishing was curtailed in 2000 when federal management began after overfishing in the 1990s led to an overfished finding. Examining vessels possessing any federal permit and landings of at least 10,000 pounds of spiny dogfish, during the initial rebuilding from 2001-2005, 29-68 vessels participated in the spin dogfish fishery. As abundance increased and fishing measures were liberalized, participation increased to a peak of 282 vessels in 2012. Participation has been declining since 2012, and 80 such vessels participated in the 2022 fishing year.

Figure 27 below, from the 2023 Assessment, describes spiny dogfish catch 1924-2022 and highlights the 1970s foreign fishery (teal color) and then domestication of the fishery in the 1990s (royal blue). Figure 28 to Figure 30 describe recent domestic landings, nominal ex-vessel revenues, and prices (inflation adjusted). Data since 1996 is more reliable than previous data due to improvements in reporting requirements. The Gross Domestic Product Implicit Price Deflator was used to report ex-vessel prices as "2022 dollars." Figure 31 illustrates preliminary weekly 2022 (yellow-orange) and 2023 (blue) landings through the year. Figure 32 displays locations of 2010-2021 NEFSC survey catches and VTR landings.

Recently most landings were in MA, VA, and NJ (Table 35). The fishery occurs throughout the year but is more focused north in the summer and south in the winter (Table 36). Most landings are made with gillnet gear (Table 37). There has been a recent decline in the number of federally-permitted vessels

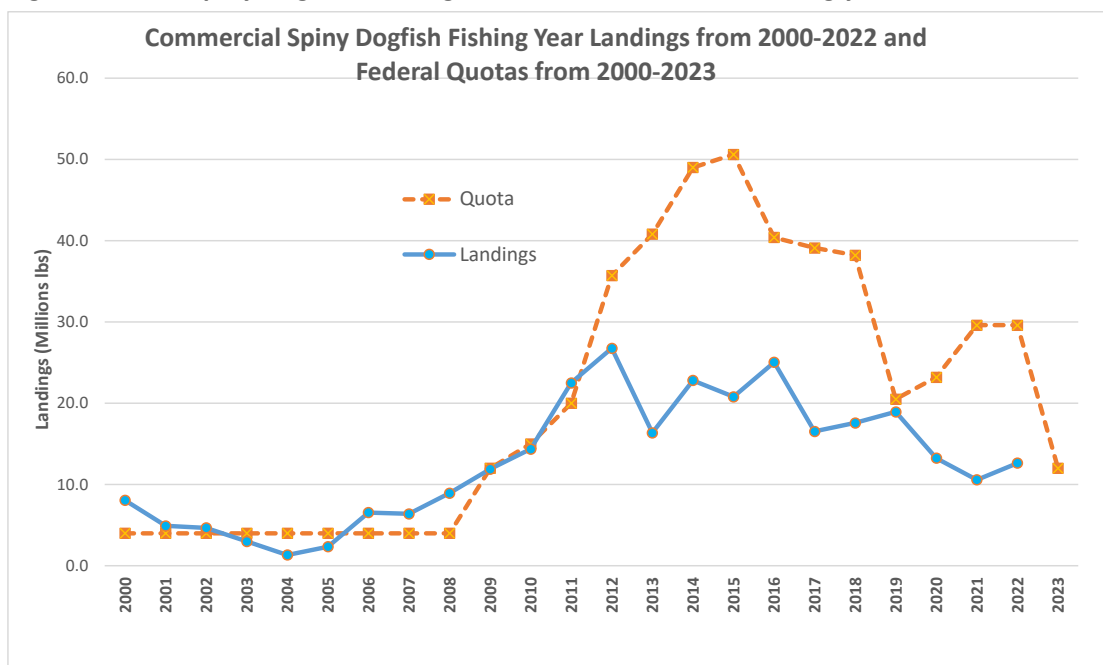
participating (Table 38). Individual port data are not provided as it may violate the spirit of data confidentiality provisions even if not the letter of the law (an astute observer could potentially glean confidential data even if not obvious to some readers).

Figure 27. Spiny Dogfish Catches 1924-2022.



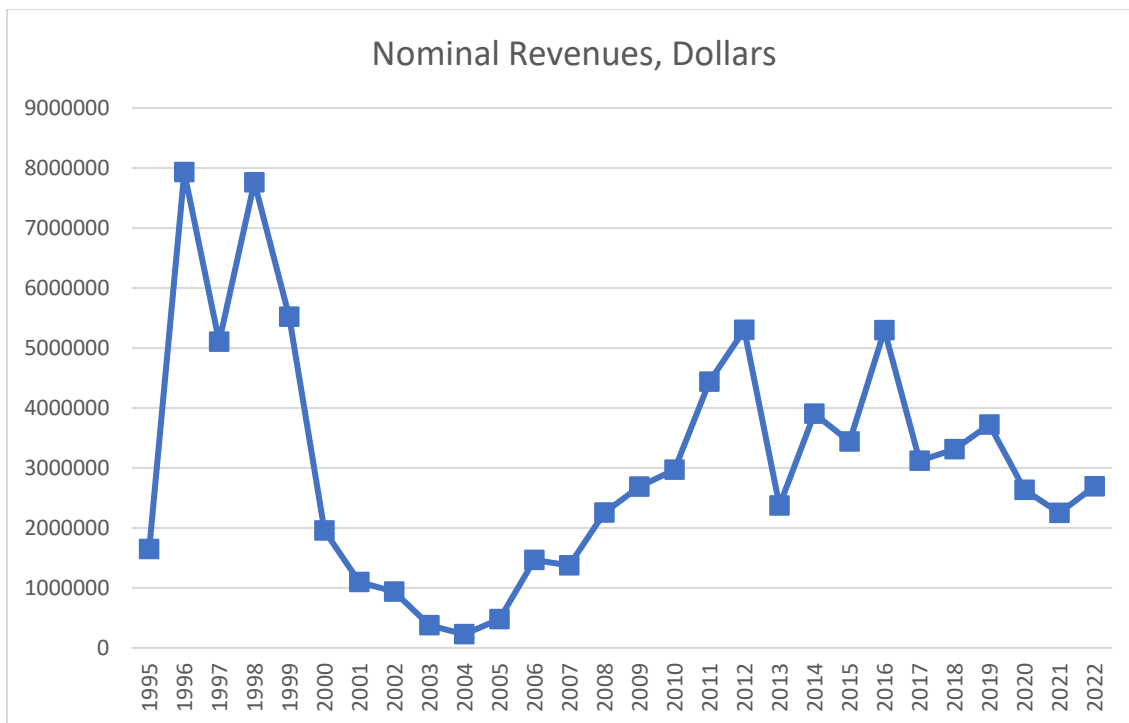
Source: 2023 Spiny Dogfish Management Track Assessment, available at <https://apps-nefsc.fisheries.noaa.gov/saw/sasi.php>.

Figure 28. U.S. Spiny Dogfish Landings and Quotas 2000-2023 fishing years.



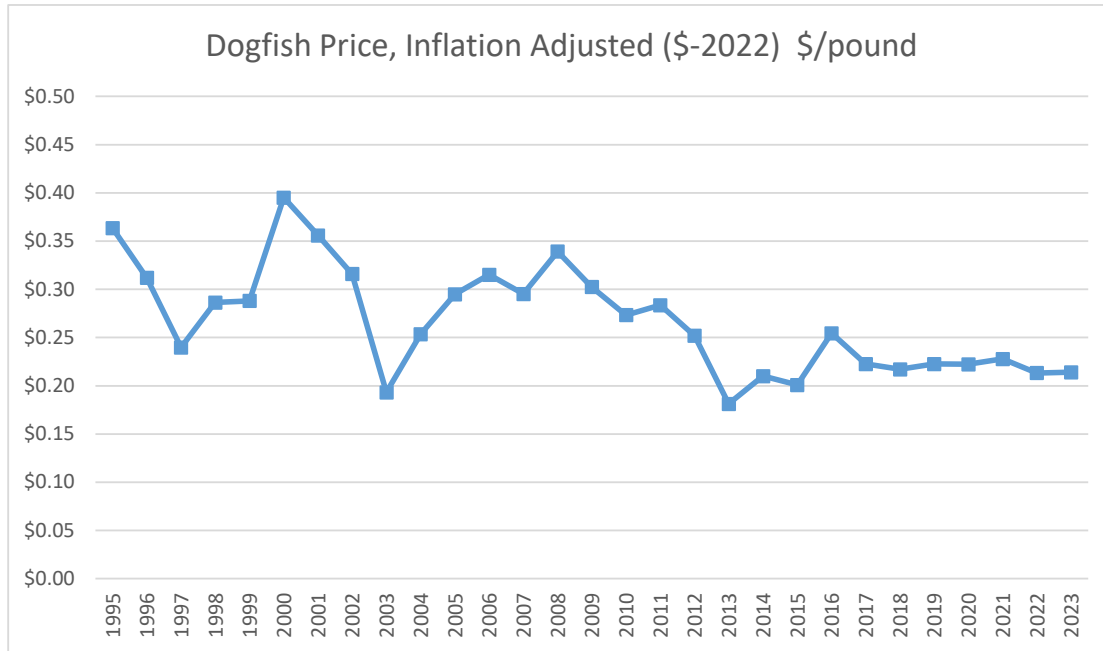
Source: NMFS unpublished dealer data.

Figure 29. Spiny Dogfish Ex-Vessel Revenues 1995-2022 fishing years, Nominal Dollars.



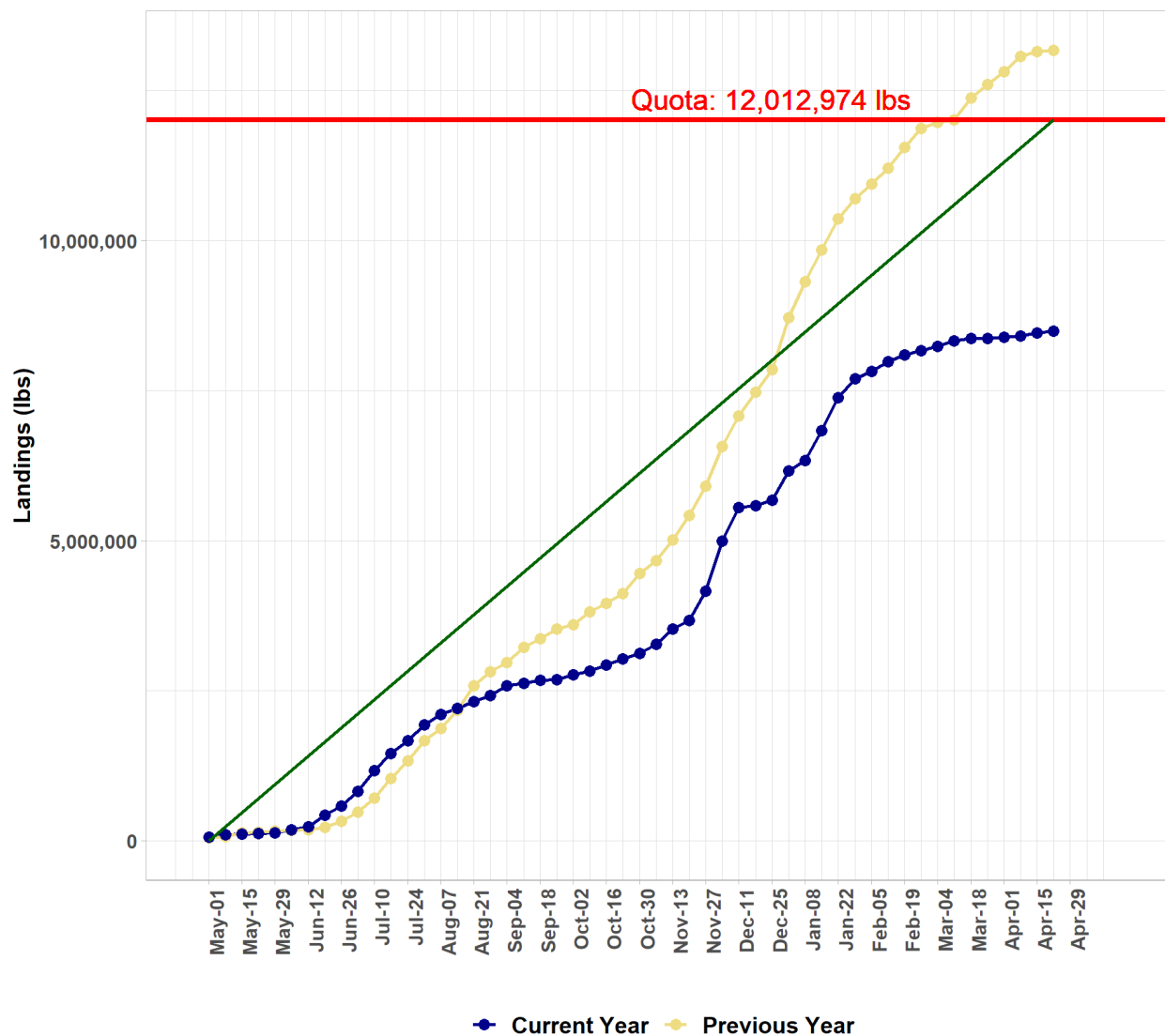
Source: Unpublished NMFS landings data.

Figure 30. Ex-Vessel Spiny Dogfish Prices 1995-2022 Adjusted to 2022 Dollars.



Source: NMFS unpublished dealer data.

Figure 31. U.S. Preliminary spiny dogfish landings; 2023 fishing year in dark blue, 2022 in yellow-orange.



Source: https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports/h/dog/dog_coast_qm.html. For data reported through 2024-05-12 for quota period 2023, accessed May 14, 2024. 2023 fishing year quota noted (12.0 million pounds).

Figure 32. Survey and VTR Spiny Dogfish Catches 2010-2021 – Assessment – Jones 2022 Working Paper
 available at <https://apps-nefsc.fisheries.noaa.gov/saw/sasi.php>.

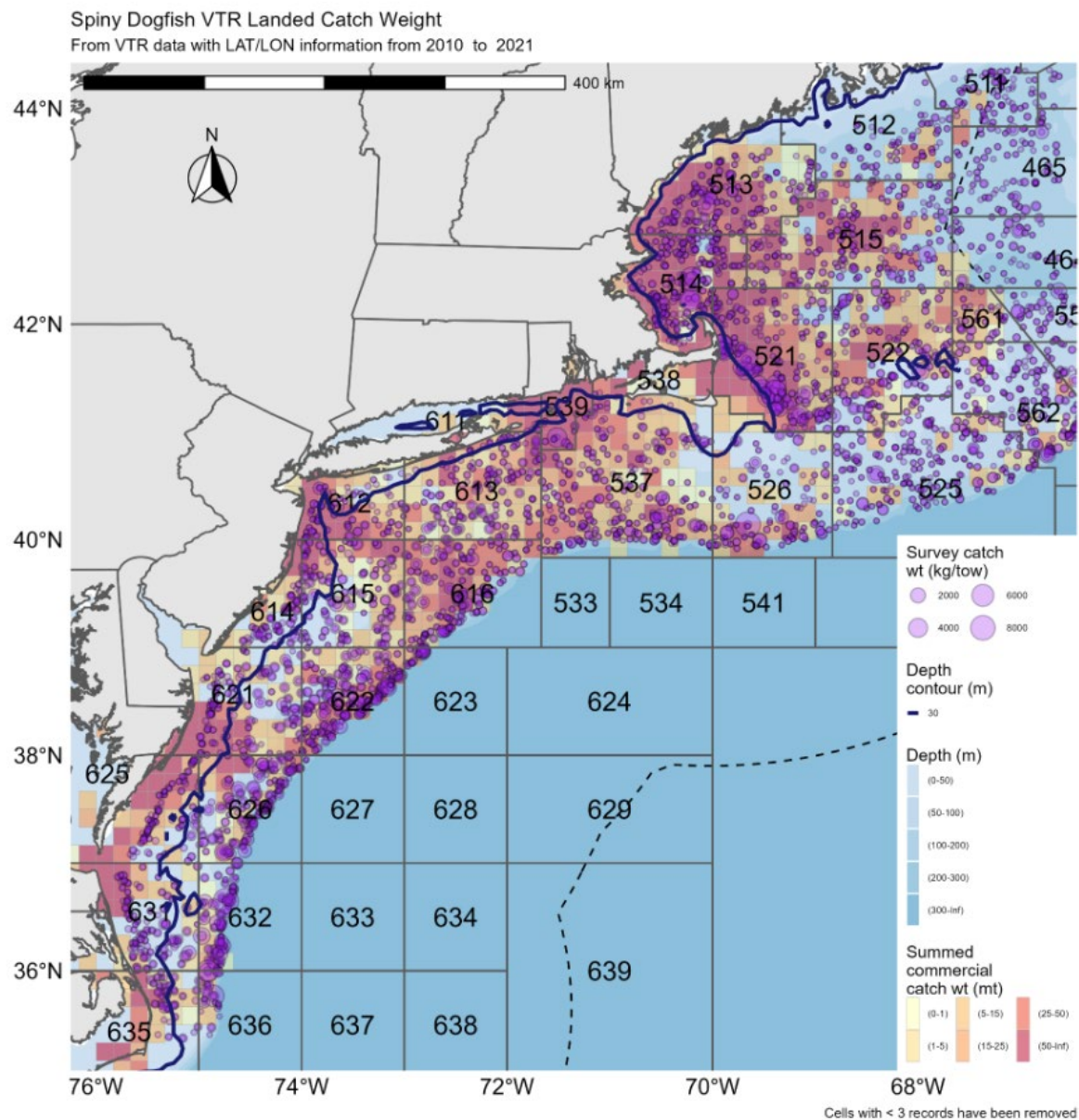


Table 35. Commercial Spiny Dogfish landings (live weight – millions of pounds) by state for 2020-2022 fishing years.

Year	MA	VA	NJ	Other (ME, NH, RI, CT, NY, MD, NC)	Total
2020	6.6	3.3	2.0	1.4	13.3
2021	3.8	4.0	1.6	1.2	10.6
2022	3.8	6.0	1.7	1.1	12.6

Source: NMFS unpublished dealer data.

Table 36. Commercial Spiny Dogfish landings (live weight – millions of pounds) by months for 2020-2022 fishing years.

Year	May-Aug	Sept-Dec	Jan-April	Total
2020	4.9	5.5	2.8	13.3
2021	2.9	4.6	3.1	10.6
2022	2.7	5.0	4.9	12.6

Source: NMFS unpublished dealer data. ²

Table 37. Commercial Spiny Dogfish landings (live weight – millions of pounds) by gear for 2020-2022 fishing years.

Year	GILL_NET_SINK_OTHER	LOGLINE_BOTTOM	TRAWL_OTTER_BOTTOM_FISH	Unknown/Other	Total
2020	9.7	1.8	0.4	1.4	13.3
2021	9.2	0.5	0.3	0.6	10.6
2022	10.1	0.9	0.2	1.3	12.6

Source: NMFS unpublished dealer data. ²

Table 38. Vessel participation over time in the Spiny Dogfish Fishery based on annual landings (pounds). Note: State-only vessels are not included.

YEAR	Vessels 200,000+	Vessels 100,000 - 199,999	Vessels 50,000 - 99,999	Vessels 10,000 - 49,999	Total with at least 10,000 pounds landings
2000	16	10	8	43	77
2001	4	12	10	33	59
2002	2	14	8	31	55
2003	4	5	3	17	29
2004	0	0	0	42	42
2005	0	0	1	67	68
2006	0	4	11	114	129
2007	1	2	21	72	96
2008	0	5	20	119	144
2009	0	11	42	166	219
2010	0	26	54	124	204
2011	1	48	73	135	257
2012	25	55	56	146	282
2013	10	27	45	87	169
2014	27	38	38	81	184
2015	31	33	36	59	159
2016	52	26	14	45	137
2017	28	27	24	32	111
2018	28	26	20	35	109
2019	29	25	21	29	104
2020	23	27	15	22	87
2021	15	27	11	26	79
2022	28	9	14	29	80

Source: NMFS unpublished dealer data.

6.0 ENVIRONMENTAL IMPACTS OF ALTERNATIVES

6.1 INTRODUCTION

The impacts of the alternatives under consideration are evaluated herein relative to the valued ecosystem components (VECs) described in the Affected Environment (Section 5.0) and to each other. This action evaluates the potential impacts described in terms of their direction (negative, positive, or no impact) and their magnitude (slight, moderate, or high) based on the guidelines shown in Table 39.

Table 39. General definitions for impacts and qualifiers relative to resource condition (i.e., baseline).

VEC	Resource Condition	Impact of Action		
		Positive (+)	Negative (-)	No Impact (0)
Target and Nontarget Species	Overfished status defined by the MSA	Alternatives that would maintain or are projected to result in a stock status above an overfished condition*	Alternatives that would maintain or are projected to result in a stock status below an overfished condition*	Alternatives that do not impact stock / populations
ESA-listed Protected Species (endangered or threatened)	Populations at risk of extinction (endangered) or endangerment (threatened)	Alternatives that contain specific measures to ensure no interactions with protected species (e.g., no take)	Alternatives that result in interactions/take of listed resources, including actions that reduce interactions	Alternatives that do not impact ESA listed species
MMPA Protected Species (not also ESA listed)	Stock health may vary but populations remain impacted	Alternatives that will maintain takes below PBR and approaching the Zero Mortality Rate Goal	Alternatives that result in interactions with/take of marine mammal species that could result in takes above PBR	Alternatives that do not impact MMPA Protected Species
Physical Environment / Habitat / EFH	Many habitats degraded from historical effort (see condition of the resources table for details)	Alternatives that improve the quality or quantity of habitat	Alternatives that degrade the quality, quantity or increase disturbance of habitat	Alternatives that do not impact habitat quality
Human Communities (Social and Economic)	Highly variable but generally stable in recent years (see condition of the resources table for details)	Alternatives that increase revenue and social well-being of fishermen and/or communities	Alternatives that decrease revenue and social well-being of fishermen and/or communities	Alternatives that do not impact revenue and social well-being of fishermen and/or communities
Impact Qualifiers				
A range of impact qualifiers is used to indicate any existing uncertainty	Negligible		To such a small degree to be indistinguishable from no impact	
	Slight (sl) as in slight positive or slight negative		To a lesser degree / minor	
	Moderate (M) positive or negative		To an average degree (i.e., more than “slight”, but not “high”)	
	High (H), as in high positive or high negative		To a substantial degree (not significant unless stated)	
	Significant (in the case of an EIS)		Affecting the resource condition to a great degree, see 40 CFR 1508.27.	
	Likely		Some degree of uncertainty associated with the impact	
*Actions that will substantially increase or decrease stock size, but do not change a stock status may have different impacts depending on the particular action and stock. Meaningful differences between alternatives may be illustrated by using another resource attribute aside from the MSA status, but this must be justified within the impact analysis.				

6.1.1 Current Fishing Effort

Current fishing gear density compiled by the Decision Support Tool (DST) team are included below, which served as the basis for the evaluation of time/area closures. The figures include the current gear density from VTRs and VMS reports from a subset of years, 2017 - 2020 for federal gillnet, for both monkfish and dogfish fisheries in aggregate (Figure 33) and also separately (Figure 34 and Figure 35). The gear density figures are broken down by months being considered for time/area closure alternatives. It is worth noting that substantive changes in fishing effort in other gear types are not expected nor a shift to other gear types as a result of this action. In the DST gear density figures, lighter colors represent greater gear densities.

Figure 33. Current gillnet gear density for monkfish and dogfish based on VTR and VMS data from 2017-2020, compiled by DST team.

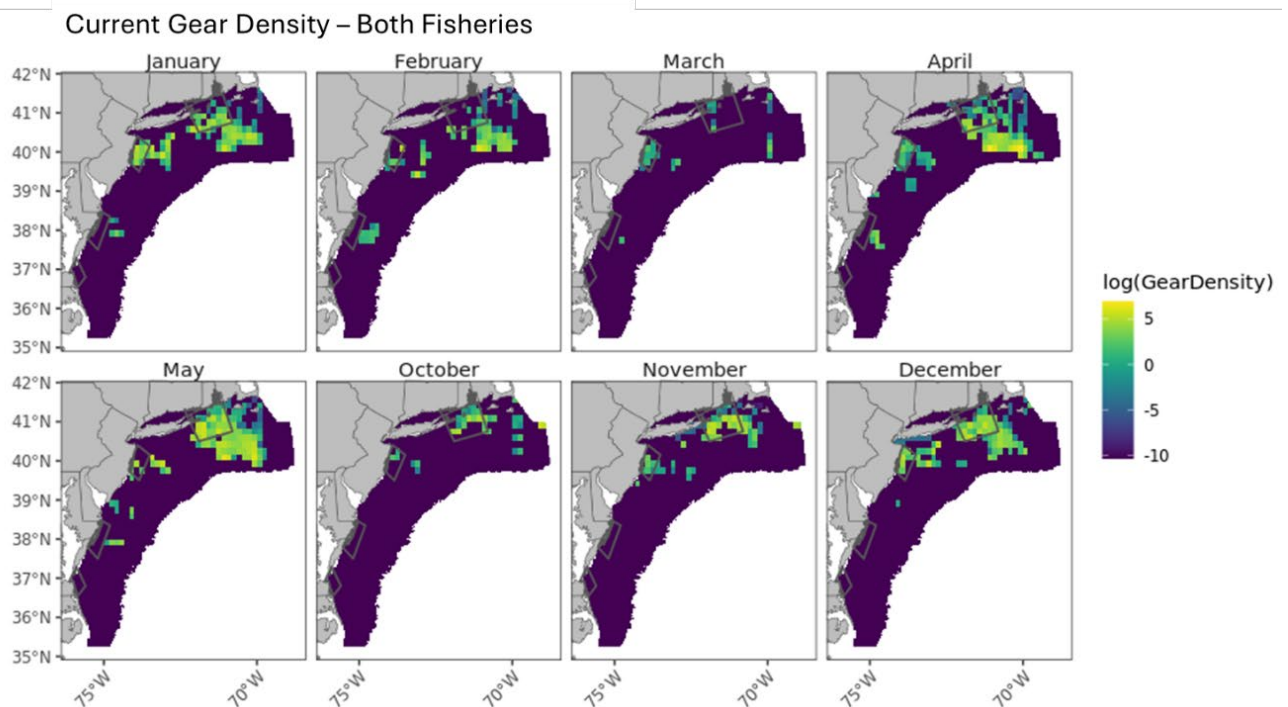
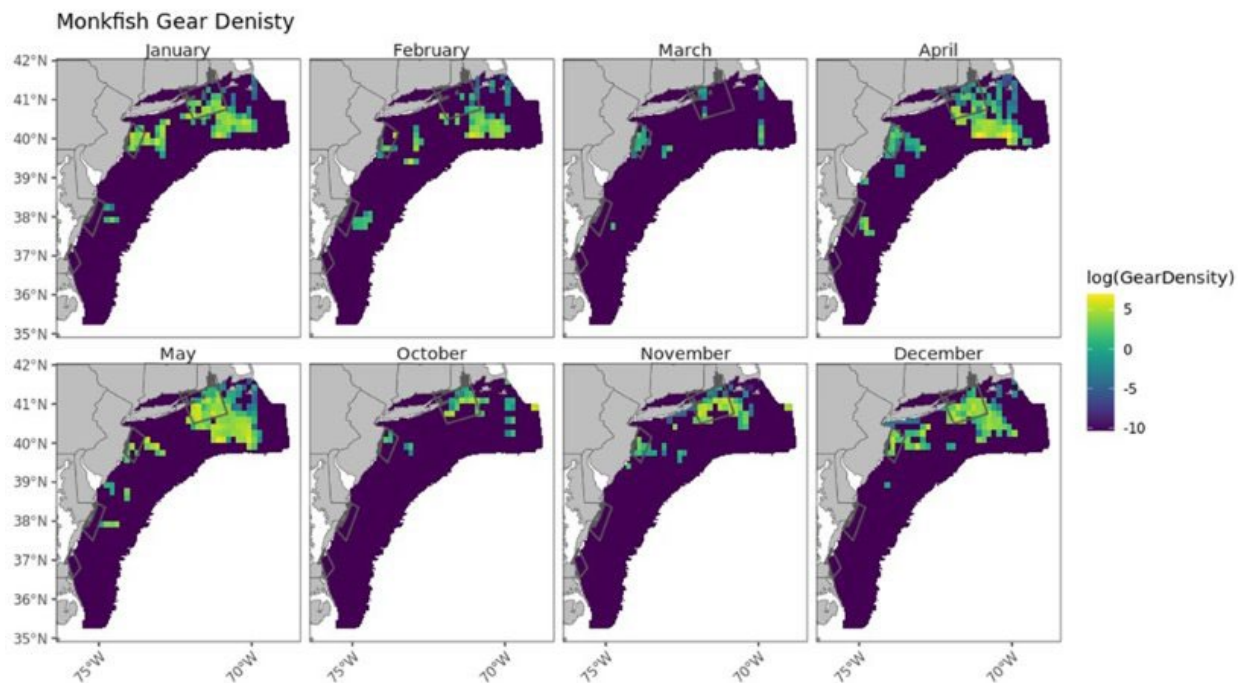
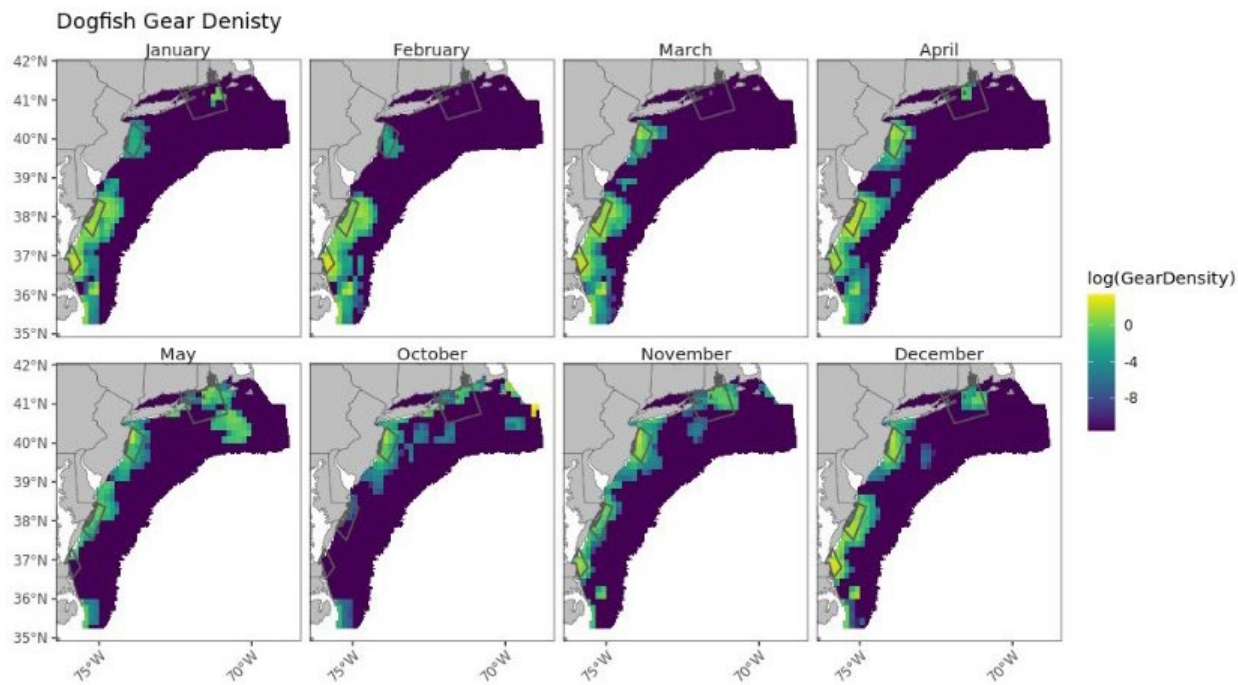


Figure 34. Current gillnet gear density for monkfish based on VTR and VMS data from 2017-2020, compiled by DST team.



Note: Potential months under consideration for monkfish closures in range of alternatives: April, May, December for SNE polygon; May, October (15-31), November, December for New Jersey polygon.

Figure 35. Current gillnet gear density for dogfish (data do not differentiate between spiny and smooth dogfish), based on VTR and VMS data from 2017-2020, compiled by DST team.



Note: Potential months under consideration for dogfish closures in range of alternatives: May, October (15-31), November, December for New Jersey polygon; January, February, March, November, December for DE/MD/VA polygons.

6.1.2 Expected Changes in Fishing Effort Under Each Alternative

The expected impacts of the alternatives on the VECs are derived from consideration of both the current conditions of the VECs and expected changes in fishing effort under each alternative. Fishing effort is influenced by a variety of interacting factors, including regulations (catch and landings limits, possession limits, gear restrictions, seasonal closures, etc.), availability of the species in question and other potential target species, market factors such as price of various potential target species (monkfish and dogfish or other opportunities), and other factors. It is important to note that actual fishing effort may differ from these expectations based on changes in availability, market factors, and other conditions which are difficult to predict. The Decision Support Tool was used to evaluate time/area closures and impacts from gear modifications and are summarized below. Following that, input from fishery participants is integrated to develop a synthesis prediction about likely fishing effort under the alternatives.

Time/area closure evaluation methodology

The Decision Support Tool (DST), used to support development of Atlantic Large Whale Take Reduction Team measures, was adapted for use in the Council's sturgeon bycatch action. Specifically, the fixed-gear fishery layer was utilized to examine how gillnet effort/gear distribution might change in response to the proposed sturgeon bycatch measures. The fixed-gear fishery layer was isolated to the monkfish and dogfish species groups. Note: the monkfish fishery group includes monkfish and skates, and the dogfish fishery group includes spiny and smooth dogfish. Trips are assigned to Species Grouping based on primary species landed (from VTRs). The monkfish and dogfish species groups are further subdivided into mesh size (small [< 5 in], medium [$5 - 7$ in], and large [> 7 in]) and gillnet type (anchor or drift).

The DST uses VTRs and VMS reports from a subset of years (2017 - 2020 for federal gillnet). Where available and appropriate, gear configuration is additionally informed by fisheries observer reports and interviews with relevant state agencies. Each VTR is used to estimate the amount of gear that is deployed during an individual trip. That gear is distributed over space and assigned to 1 square mile cells throughout the coast based on the coordinates, depth or reporting area used in the trip report. Using the soak time to know how long that gear was deployed, the gear is distributed over the course of a month to get a monthly timescale.

Using this monthly timescale of gillnet gear density, the DST then estimates how gillnet effort might change in response to the proposed management measures, including whether gear is removed (i.e., ceases fishing) or is displaced to areas outside the polygons where measures are applied. Gear is only displaced to cells where the fishery is currently active, where there is at least one existing similar trip (same primary landed species, same gear configuration, and similar mesh size). Gear is not distributed to cells where the fishery and subset gear type [mesh size, gillnet type] has not reported effort during the subset years of which VTRs were queried. Gear cannot be displaced to a cell that is affected by another closure for the same fishery. The amount of gear displaced to qualifying cells depends on 1) how far the cell is from where the gear is currently located, and 2) the distribution of fishing effort in that cell (a cell with more fishing effort is estimated to be more favorable to fishing, and more gear is placed here). Gear without an eligible cell for displacement is removed from the fishery. The DST uses a specified cost-benefit parameter for the maximum distance for gear displacement (how far a vessel would travel). Each alternative was tested with two maximum distances for gear displacement: 20 and 50 miles from where the gear is currently placed. If no cell was available within this distance, gear was removed from the fishery.

For each alternative, the DST results describe the proportion of gear that is removed, and the proportion of gear displaced to areas outside the polygons where measures are applied.

The next step would be to combine the results of the gear density/redistribution with the sturgeon risk mapping. However, because the risk of sturgeon take is spatially diffuse, gear redistributes to areas with the same risk of sturgeon take (see Section 6.1.3). Thus, take reduction is seen when gear is removed rather than redistributed.

Time/area closure results

Preliminary results from the DST tool are included in the following tables and figures. Additional preliminary data results, both figures and tables, are included in Appendix A (Section 10). The preliminary results were reviewed by industry members who were previously involved in the application of the DST model for Atlantic Large Whales Take Reduction Team's work and/or have knowledge in the monkfish and spiny dogfish fisheries. A summary of those informal meetings with industry is also available in Appendix A.

The DST was run under two displacement restriction scenarios. In the first, the model would search out alternative areas within 20-miles of the historical effort where similar fishing had occurred, and if no suitable areas were found then the effort was eliminated. In the second, the model would search out alternative areas within 50-miles of the historical effort where similar fishing had occurred, and if no suitable areas were found then the effort was eliminated. If a 20-mile restriction is used, then more gear is predicted to be eliminated, essentially saying that vessels will only move so far before the likely higher costs cause them to give up.

The DST indicated that for Alternative 2, we'd expect 2%-8% of coast-wide gillnet effort to be eliminated. The higher 8% effort elimination would be associated with the within-20-miles displacement restriction (Table 40) and the lower 2% effort elimination would be associated with the within-50-miles displacement restriction (Table 41).

The DST indicated that for Alternative 3, we'd expect 2%-7% of coast-wide gillnet effort to be eliminated. The higher 7% effort elimination would be associated with the within-20-miles displacement restriction (Table 42) and the lower 2% effort elimination would be associated with the within-50-miles displacement restriction (Table 43).

The DST indicated that for Alternative 4, we'd expect 1%-3% of coast-wide gillnet effort to be eliminated. The higher 7% effort elimination would be associated with the within-20-miles displacement restriction (Table 44) and the lower 2% effort elimination would be associated with the within-50-miles displacement restriction (Table 45).

Generally effort displaces north, south, and seaward of the proposed restricted areas. While more gear is removed from the closure areas, the relatively small amount of gear affected and the potential for displacement means that overall effort changes are slight. The change in location also generally should have slight effects, except it was noted that for the southern New England area, the eastward shift of effort could affect right whales, which are known to frequent the areas into which effort is predicted to shift.

Industry input (summarized in Appendix A) indicated that while the DST could be a useful tool to think about potential effort changes, it could over or under estimate impacts in some cases. For example, not accounting for conflicts with mobile gear would have effort shifts appear more likely than actual (underestimating effort reductions), but not accounting for more historical fishing grounds may artificially reduce areas feasible for effort displacement (overestimating effort reductions). Industry input was also concerned that from the perspective of impacts on fishermen in different regions, focusing on the overall gear/effort reduction may obfuscate the impacts on particular fishermen. Also, if the restrictions and associated costs put an operation out of business, the realized impacts may be higher than predicted by the DST.

Given the input received, the higher amounts of total effort reduction, i.e. those where the model says fishermen will not relocate by more than 20 miles, are probably most reasonable. As such, one would expect coastwide reductions in gillnet effort of 8% for Alternative 2, 7% for Alternative 3, and 3% for Alternative 4. With more gear removed in the 20-mile model options, there is less gear displaced to other areas than the 50-mile model options: 1,578 gear/days for Alternative 2 (5,666-4,088; bottom of table 40), 1,249 gear/days for Alternative 3 (4,837-3,588; bottom of table 42), and 394 gear/days for Alternative 4 (1,840-1,446; bottom of table 44). The predicted gear displacement areas are described in Appendix A, and while they vary by month, the general trend is north, south, and seaward of the original locations. If effort actually displaces further, the 50-mile results may be more likely, with less overall effort reduction and more shifting of gear locations (per Tables 41, 43, and 45).

In terms of the gear restriction measures included in Alternative 2 through 5, negligible effort shifts in intensity or distribution in neither the monkfish nor dogfish fisheries are expected. Industry feedback during Council development of these alternatives indicated that fishery participants would be likely to continue operating within the bycatch hotspot polygons in compliance with the proposed measures. For both fisheries, there may be some displacement of effort to the boundaries of the polygons as vessels avoid the gear restrictions, and some participants may eliminate their gear/effort as a result of these measures (if the additional requirements are too burdensome), but these are expected to be outliers and overall effort should remain approximately similar, at least in terms of the effects of the proposed measures' gear restrictions.

Table 40. Alternative 2 DST results for a 20-mile maximum gear displacement.

Alternative 2 - 20 miles displacement	Total Gear (# nets) Before Closure	Total Gear (# nets) After Closure	% Coastwide Reduction	Gear Removed	Gear Subject to Closure	% Removed from Closure
January	4,109	4,093	0.39%	16	66	24%
February	2,545	2,528	0.67%	17	75	23%
March	273	260	4.76%	13	75	17%
April	6,138	5,856	4.59%	282	524	54%
May	8,370	6,454	22.89%	1,916	2,698	71%
June	7,241	7,241	0.00%	0	0	NA
July	4,019	4,019	0.00%	0	0	NA
August	3,634	3,634	0.00%	0	0	NA
September	2,358	2,358	0.00%	0	0	NA
October	2,754	2,744	0.36%	10	15	67%
November	3,275	3,209	2.02%	66	101	65%
December	3,918	2,150	45.13%	1,768	2,113	84%
SUM	48,635	44,545	8.41%	4,088	5,666	72%

Table 41. Alternative 2 DST results for a 50-mile maximum gear displacement.

Alternative 2 – 50- miles displacement	Total Gear (# nets) Before Closure	Total Gear (# nets) After Closure	% Coastwide Reduction	Gear Removed	Gear Subject to Closure	% Removed from Closure
January	4,109	4,100	0.22%	9	66	14%
February	2,545	2,537	0.31%	8	75	11%
March	273	266	2.56%	7	75	9%
April	6,138	6,113	0.41%	25	524	5%
May	8,370	8,215	1.85%	155	2,698	6%
June	7,241	7,241	0.00%	0	0	NA
July	4,019	4,019	0.00%	0	0	NA
August	3,634	3,634	0.00%	0	0	NA
September	2,358	2,358	0.00%	0	0	NA
October	2,754	2,746	0.29%	8	15	53%
November	3,275	3,273	0.06%	2	101	2%
December	3,918	3,226	17.66%	692	2,113	33%
SUM	48,635	47,728	1.86%	906	5,666	16%

Table 42. Alternative 3 DST results for a 20-mile maximum gear displacement.

Alternative 3 – 20- miles displacement	Total Gear (# nets) Before Closure	Total Gear (# nets) After Closure	% Coastwide Reduction	Gear Removed	Gear Subject to Closure	% Removed from Closure
January	4,109	4,093	0.39%	16	66	24%
February	2,545	2,528	0.67%	17	75	23%
March	273	273	0.00%	0	0	NA
April	6,138	6,138	0.00%	0	0	NA
May	8,370	6,593	21.23%	1,777	2,528	70%
June	7,241	7,241	0.00%	0	0	NA
July	4,019	4,019	0.00%	0	0	NA
August	3,634	3,634	0.00%	0	0	NA
September	2,358	2,358	0.00%	0	0	NA
October	2,754	2,754	0.00%	0	0	NA
November	3,275	3,265	0.31%	10	55	18%
December	3,918	2,150	45.13%	1,768	2,113	84%
SUM	48,635	45,046	7.38%	3,588	4,837	74%

Table 43. Alternative 3 DST results for a 50-mile maximum gear displacement.

Alternative 3 – 50- miles displacement	Total Gear (# nets) Before Closure	Total Gear (# nets) After Closure	% Coastwide Reduction	Gear Removed	Gear Subject to Closure	% Removed from Closure
January	4,109	4,100	0.22%	9	66	14%
February	2,545	2,537	0.31%	8	75	11%
March	273	273	0.00%	0	0	NA
April	6,138	6,138	0.00%	0	0	NA
May	8,370	8,215	1.85%	155	2,528	6%
June	7,241	7,241	0.00%	0	0	NA
July	4,019	4,019	0.00%	0	0	NA
August	3,634	3,634	0.00%	0	0	NA
September	2,358	2,358	0.00%	0	0	NA
October	2,754	2,754	0.00%	0	0	NA
November	3,275	3,275	0.00%	0	55	0%
December	3,918	3,226	17.66%	692	2,113	33%
SUM	48,635	47,770	1.78%	864	4,837	18%

Table 44. Alternative 4 DST results for a 20-mile maximum gear displacement.

Alternative 4 – 20- miles displacement	Total Gear (# nets) Before Closure	Total Gear (# nets) After Closure	% Coastwide Reduction	Gear Removed	Gear Subject to Closure	% Removed from Closure
January	4,109	4,093	0.39%	16	66	24%
February	2,545	2,545	0.00%	0	0	NA
March	273	273	0.00%	0	0	NA
April	6,138	6,138	0.00%	0	0	NA
May	8,370	8,370	0.00%	0	0	NA
June	7,241	7,241	0.00%	0	0	NA
July	4,019	4,019	0.00%	0	0	NA
August	3,634	3,634	0.00%	0	0	NA
September	2,358	2,358	0.00%	0	0	NA
October	2,754	2,754	0.00%	0	0	NA
November	3,275	3,215	1.83%	60	80	75%
December	3,918	2,548	34.97%	1,370	1,694	81%
SUM	48,635	47,188	2.98%	1,446	1,840	79%

Table 45. Alternative 4 DST results for a 50-mile maximum gear displacement.

Alternative 4 – 50-miles displacement	Total Gear (# nets) Before Closure	Total Gear (# nets) After Closure	% Coastwide Reduction	Gear Removed	Gear Subject to Closure	% Removed from Closure
January	4,109	4,100	0.22%	9	66	14%
February	2,545	2,545	0.00%	0	0	NA
March	273	273	0.00%	0	0	NA
April	6,138	6,138	0.00%	0	0	NA
May	8,370	8,370	0.00%	0	0	NA
June	7,241	7,241	0.00%	0	0	NA
July	4,019	4,019	0.00%	0	0	NA
August	3,634	3,634	0.00%	0	0	NA
September	2,358	2,358	0.00%	0	0	NA
October	2,754	2,754	0.00%	0	0	NA
November	3,275	3,275	0.00%	0	80	0%
December	3,918	3,254	16.95%	664	1,694	39%
SUM	48,635	47,961	1.39%	673	1,840	37%

6.1.3 Potential Reduction in Sturgeon Bycatch

To assess the likelihood of sturgeon take occurrence in a given location based on the expected changes in fishing effort described in Section 6.1.2, an analysis was conducted to evaluate changes in sturgeon takes from the time/area closure alternatives. The main result is that a shift in total fishing effort may offset intended bycatch mitigation given there is a similar chance of encountering a sturgeon relative to where previous fishing activity occurred. Overall, there is a very similar percent take reduction to percent gear removed because risk of sturgeon interaction is spatially diffuse and effort shifts and gear redistributes to areas with the same risk of sturgeon encounters. Generally, take reduction is seen when gear is removed. The final report of this work can be found in Appendix B.

As described in Section 5.3.5.2, the observed or documented interactions between Atlantic sturgeon and gillnet gear in the Greater Atlantic Region has been described in several documents. Across all gears and observer programs that have encountered Atlantic sturgeon, the distribution of haul depths on observed hauls that caught Atlantic sturgeon was significantly different from those that did not encounter Atlantic sturgeon, with Atlantic sturgeon encountered primarily at depths under 20 m (ASMFC 2017a). More recent studies support that habitat features such as depth and water temperature influence Atlantic sturgeon distribution in the Mid-Atlantic Bight (Breece et al. 2016; Breece et al. 2018).

Detections of acoustically-tagged sturgeon in an area identified for offshore wind leases located between Long Island and the coast of New Jersey, extending 11.5 to 24 nautical miles southeast of Long Island, with water depths ranging from 23 m to 41 m indicated that the tagged sturgeon were most abundant in the area in the winter months (i.e., December through February) and occurred throughout the area including the waters furthest from shore and up to 41 m deep. The sturgeon were least abundant, including zero detections in some years, during the months of July through September (Ingram et al. 2019). Further south, a broad-scale acoustic array detected 352 in Mid-Atlantic waters off Maryland over a two-year period (Rothermel et al. 2020). As seen by Ingram et al., Atlantic sturgeon selected for deeper waters in the fall. In addition, as suggested by modeling (Breece et al. 2016; Breece et al., 2018), Atlantic sturgeon presence was associated with warmer water temperatures further offshore in the fall and winter compared

to more near-shore waters (Rothermel et al. 2020). However, Rothermel et al. also noted that in their study area Atlantic sturgeon had a wider continental shelf distribution in their fall migration related to depth and water temperature gradients which likely reflects the temperature gradient across the continental shelf in more southern Mid-Atlantic waters in the winter.

The expected sturgeon takes per days fished in the sturgeon take analysis (Figure 3 of the analysis) reflects some of what would be expected based on the available literature. Specifically, the expected take of sturgeon in July through September is less than in other months; a time that coincides with sturgeon presence in coastal estuaries. The expected take of sturgeon is highest and most concentrated in the southern Mid-Atlantic Bight off Virginia in December and across the continental shelf, then declines somewhat through the winter months; findings that are consistent with Rothermel et al. (2020) and modeling by Breece et al. (2016; 2018). It is difficult to discern more detailed distribution of Atlantic sturgeon at the scale of the analysis and the scale of the sturgeon bycatch hotspot polygons. In addition, the expected sturgeon takes per day is influenced by where and when fishing effort occurs. However, telemetry detections of Atlantic sturgeon for Ingram et al. (2019) and Rothermel et al. (2020) were limited to the area where telemetry receiver arrays could be placed and the number of tagged sturgeon that passed through the telemetry arrays. Therefore, each method has its limitations for identifying Atlantic sturgeon presence throughout the Mid-Atlantic Bight in all months.

Table 46. Expected percent reduction of Atlantic Sturgeon takes by federally-permitted vessels using gillnet gears under various actions and behavior (max movement distance) scenarios. Action 1 is ‘no action’ and other alternatives not involving closures are also not listed (i.e., Alternative 5 gear-only).

<i>Action</i>	<i>Max Distance Move (nm)</i>	<i>Percent Reduction</i>
2	20	13.00%
2	50	4.20%
3	20	10.60%
3	50	3.20%
4	20	4.10%
4	50	1.90%

6.2 IMPACTS ON TARGET SPECIES

6.2.1 Alternative 1 – No Action

Under Alternative 1 (No Action), the current federal measures for the monkfish and spiny dogfish gillnet fisheries would remain – new measures to reduce sturgeon bycatch would not be implemented in 2024 through Council action.

The impacts of Alternative 1 on the target species (monkfish and spiny dogfish) would likely be negligible to slight positive. The justification for this conclusion includes: According to the 2022 monkfish stock assessment, the stock status of monkfish is unknown and based on the 2023 management track assessment for spiny dogfish, the species was neither overfished (101% of target) nor experiencing overfishing in 2022 (81% of target). Maintaining the same fishing areas and gear configurations would be unlikely to lead to substantive changes in fishing effort and/or behavior (e.g., number of trips, amount of discarding, etc.). There would likely be the same number of trips and the proportion of discards to landings on each trip would be unchanged. The No Action effort controls in the northern and southern fishery management areas would help constrain landings and help keep landings within the total

allowable landings. Discard set asides, combined with landings limits should avoid ABC overages, which should maintain the health of the monkfish and spiny dogfish populations. The No Action alternative would not create any additional measures to constrain monkfish and spiny dogfish landings through time/area closures and gear restrictions, thus, the stock status of monkfish and spiny dogfish would likely remain the same.

6.2.2 Alternative 2 – Most restrictive Sturgeon Package (Most Time/Area Closures and Gear Restrictions)

Under Alternative 2, there would be a broad array of time/area closures and gear restrictions for both the federal monkfish and spiny dogfish gillnet fisheries in the Atlantic sturgeon bycatch hotspot areas. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon. Overall limits that drive target species mortality (the quotas/ABCs/TALs/trip limits in each fishery) would not be changed under this or other action alternatives, further supporting (besides the time/area and gear discussions below) a conclusion that overall target catch would not change in a way that is likely to change the status of the target species for this or any alternative (no action or action).

Time/area closures

The impacts of Alternative 2 time/area closures on target species (monkfish and spiny dogfish) would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 3, 4, and 5 (under any alternative, ABCs should not be exceeded and current stock status should be maintained). The justification for this conclusion includes: Preliminary results from the DST analysis and sturgeon risk mapping show there are very similar percent sturgeon take reductions correlated to percent gear removed. More specifically, with a 20-mile cap on distance for gear to be displaced from where the gear was fished, 8.4% of gear (measured in soak days) targeting monkfish and dogfish would be predicted to be eliminated (less would be eliminated if effort could be redirected farther away) (see Table 40). The relevant gear in the DST is gillnet greater than 5-inches landing mostly Monkfish/Skate/Dogfish. With a 50-mile cap on distance for gear to be displaced, 1.9% of coastwide dogfish and monkfish effort is unable to be displaced (see Table 41). With either the 20-mile cap or 50-mile cap, the remaining gear soak days that are not expected to be eliminated are predicted to shift to other areas outside the closures, to where there is at least one existing similar trip (i.e. primary VTR kept catch was monkfish/dogfish in same month by the same gear and similar mesh). The potential reductions in overall monkfish and spiny dogfish fishing effort are not expected to substantially change overall monkfish or spiny dogfish catch, so the status of monkfish and spiny dogfish should not change.

Gear modifications

The impacts of Alternative 2 gear modifications on target species (monkfish and spiny dogfish) would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 3, 4, and 5. The justification for this conclusion includes: In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to monkfish because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between monkfish catch in the control and experimental low-profile gillnet gear. Additional information on this experimental low-profile gillnet gear is included in Alternative 2 rationale. Any potential reductions in overall monkfish or spiny dogfish catch would be unlikely to change their statuses.

6.2.3 Alternative 3 – Intermediate Sturgeon Package

Under Alternative 3, a subset of the time/area closures and gear restrictions under consideration in Alternative 2 for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas. This alternative is the intermediate alternative under consideration in terms of closures. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot area. Overall limits that drive target species mortality (the quotas/ABCs/TALs/trip limits in each fishery) would not be changed under this or other action alternatives, further supporting (besides the time/area and gear discussions below) a conclusion that overall target catch would not change in a way that is likely to change the status of the target species for this or any alternative (no action or action).

Time/area closures

The impacts of Alternative 3 time/area closures on target species (monkfish and spiny dogfish) would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 4, and 5 (under any alternative, ABCs should not be exceeded and current stock status should be maintained). The justification for this conclusion includes: Preliminary results from the DST analysis and sturgeon risk mapping show there are very similar percent sturgeon take reductions correlated to percent gear removed. More specifically, with a 20-mile cap on distance for gear to be displaced from where the gear was fished, 7.4% of gear (measured in soak days) targeting monkfish and dogfish would be predicted to be eliminated (less would be eliminated if effort could be redirected farther away) (see Table 42). The relevant gear in the DST is gillnet greater than 5-inches landing mostly Monkfish/Skate/Dogfish. With a 50-mile cap on distance for gear to be displaced, 1.8% of coastwide dogfish and monkfish effort is unable to be displaced (see Table 43). With either the 20-mile cap or 50-mile cap, the remaining gear soak days that are not expected to be eliminated are predicted to shift to other areas outside the closures, to where there is at least one existing similar trip (i.e. primary VTR kept catch was monkfish/dogfish in same month by the same gear and similar mesh). The potential reductions in overall monkfish and spiny dogfish fishing effort are not expected to substantially change overall monkfish or spiny dogfish catch, so the status of monkfish and spiny dogfish should not change.

Gear modifications

The impacts of Alternative 3 gear modifications on target species (monkfish and spiny dogfish) would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 4, and 5. The justification for this conclusion includes: In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to monkfish because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between monkfish catch in the control and experimental low-profile gillnet gear. Additional information on this experimental low-profile gillnet gear is included in Alternative 2 rationale. Regarding spiny dogfish, it is expected that fishermen would adapt to the proposed overnight soak prohibitions to minimize loss of spiny dogfish catch, possibly by changing the areas they fish.

6.2.4 Alternative 4 – Less restrictive Sturgeon Package (Least Time/Area Closures and Gear Restrictions)

Under Alternative 4, only the most targeted time/area closures and gear restrictions under consideration for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon

bycatch hotspot areas (Figure 5, Figure 6, Figure 7). This alternative has the fewest measures, based on times where observed sturgeon bycatch is the highest. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot area. Overall limits that drive target species mortality (the quotas/ABCs/TALs/trip limits in each fishery) would not be changed under this or other action alternatives, further supporting (besides the time/area and gear discussions below) a conclusion that overall target catch would not change in a way that is likely to change the status of the target species for this or any alternative (no action or action).

Time/area closures

The impacts of Alternative 4 time/area closures on target species (monkfish and spiny dogfish) would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 3, and 5 (under any alternative, ABCs should not be exceeded and current stock status should be maintained). The justification for this conclusion includes: Preliminary results from the DST analysis and sturgeon risk mapping show there are very similar percent sturgeon take reductions correlated to percent gear removed. More specifically, with a 20-mile cap on distance for gear to be displaced from where the gear was fished, 3% of gear (measured in soak days) targeting monkfish and dogfish would be predicted to be eliminated (less would be eliminated if effort could be redirected farther away) (see Table 44). The relevant gear in the DST is gillnet greater than 5-inches landing mostly Monkfish/Skate/Dogfish. With a 50-mile cap on distance for gear to be displaced, 1.4% of coastwide dogfish and monkfish effort is unable to be displaced (see Table 45). With either the 20-mile cap or 50-mile cap, the remaining gear soak days that are not expected to be eliminated are predicted to shift to other areas outside the closures, to where there is at least one existing similar trip (i.e., primary VTR kept catch was monkfish/dogfish in same month by the same gear and similar mesh). The potential reductions in overall monkfish and spiny dogfish fishing effort are not expected to substantially change overall monkfish or spiny dogfish catch, so the status of monkfish and spiny dogfish should not change.

Gear modifications

The impacts of Alternative 4 gear modifications on target species (monkfish and spiny dogfish) would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 3, and 5. The justification for this conclusion includes: In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to monkfish because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between monkfish catch in the control and experimental low-profile gillnet gear. Additional information on this experimental low-profile gillnet gear is included in Alternative 2 rationale. It is expected that fishermen would adapt to the proposed overnight soak prohibitions to minimize loss of spiny dogfish catch, possibly by changing the areas they fish.

6.2.5 Alternative 5 – Gear-Only Sturgeon Package (Preferred Alternative)

Under Alternative 5, there would be gear restrictions for both the federal monkfish and spiny dogfish fisheries in several Atlantic sturgeon bycatch hotspot areas. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot polygon and in the Delaware/Maryland/Virginia bycatch hotspot area. Overall limits that drive target species mortality (the quotas/ABCs/TALs/trip limits in each

fishery) would not be changed under this or other action alternatives, further supporting (besides the gear discussions below) a conclusion that overall target catch would not change in a way that is likely to change the status of the target species for this or any alternative (no action or action).

The impacts of Alternative 5 gear modifications on target species (monkfish and spiny dogfish) would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 3, and 4 (under any alternative, ABCs should not be exceeded and current stock status should be maintained). In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to monkfish because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between monkfish catch in the control and experimental low-profile gillnet gear. The research studies also found no significant difference in dogfish catch, though dogfish landings were modest compared to monkfish and winter skate (the top two species landed). Additional information on this experimental low-profile gillnet gear is included in Alternative 2 rationale. It is expected that fishermen would adapt to the proposed overnight soak prohibitions to minimize loss of spiny dogfish catch, possibly by changing the areas they fish. Sub-alternatives 5A and 5B would exempt a subset of the dogfish fishery using < 5.25" mesh from overnight soak prohibitions, which also should not affect the target species in a meaningful way because fishing would continue in a similar fashion and other measures control the overall catch of the target species.

6.3 IMPACTS ON NON-TARGET SPECIES

This section considered the impacts on the non-target species identified in Section 5.2., specifically the Northeast skate and Northeast multispecies (groundfish) fisheries.

6.3.1 Alternative 1 – No Action

Under Alternative 1 (No Action), the current federal measures for the monkfish and spiny dogfish gillnet fisheries would remain – new measures to reduce sturgeon bycatch would not be implemented in 2024 through Council action.

The impacts of Alternative 1 on the non-target species would likely be negligible and would be negligible relative to Alternatives 2, 3, 4, and 5. Maintaining the same fishing areas and gear configurations would unlikely change fishing effort and behavior (e.g., number of trips, amount of discarding, etc.). There would likely be the same number of trips and the proportion of discards to landings on each trip would be unchanged. The No Action effort controls in the northern and southern monkfish fishery management areas would help constrain landings and help keep landings of non-target species within their total allowable landings. The same applies for spiny dogfish given its quota controls. The No Action alternative would not create any additional measures to constrain non-target species landings through time/area closures and gear restrictions, thus, would likely not change the stock status of these species. Common non-target species include skate and Northeast multispecies and their catch is controlled by measures in their FMPs. Especially in the northern fishery management area, the monkfish fishery is largely incidental, prosecuted during fishing under other FMPs (Section 5.2). Catch of other species on trips landing monkfish and spiny dogfish are controlled by other days at sea limits, sector rules, trip limits, and other discard limiting measures in other FMPs.

6.3.2 Alternative 2 – Most restrictive Sturgeon Package (Most Time/Area Closures and Gear Restrictions)

Under Alternative 2, there would be a broad array of time/area closures and gear restrictions for both the federal monkfish and spiny dogfish gillnet fisheries in the Atlantic sturgeon bycatch hotspot areas. The

time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon.

Time/area closures

The impacts of Alternative 2 time/area closures on non-target species (primarily winter skate) in the monkfish and spiny dogfish fisheries would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 3, 4, and 5. Preliminary results from the DST analysis and sturgeon risk mapping show there are very similar percent sturgeon take reductions expected to percent gear removed. More specifically, for a 20-mile maximum distance for gear displaced from where the gear is currently displaced, 8.4% of coastwide dogfish and monkfish is unable to be displaced, meaning 8.4% of gear would be predicted to be removed from the fisheries (see Table 40). For a 50-mile maximum distance for gear displaced, 1.9% of coastwide dogfish and monkfish is unable to be displaced (see Table 41). The gear that is not expected to be removed is expected to shift to other areas where there is existing monkfish and spiny dogfish fishing. A similar level of fishing effort is expected by the gear that is relocated outside the time/area closures. Because the risk of sturgeon interaction is spatially diffuse, effort shifts and gear redistributes to areas with the same risk of sturgeon encounters. Take reduction, and thus, any reduction in non-target species catch in the monkfish and spiny dogfish fisheries, is seen where gear is removed. This potential reduction in non-target species catch from monkfish and spiny dogfish gear removal is not expected to be substantial and not expected to lead to any catch overages.

Gear modifications

The impacts of Alternative 2 gear modifications on non-target species caught in the monkfish and spiny dogfish fisheries would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 4, and 5. In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to non-target species because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between winter skate catch (primary non-target species in the monkfish fishery) in the control and experimental low-profile gillnet gear. Additional information on this experimental low-profile gillnet gear is included in Alternative 2 rationale.

6.3.3 Alternative 3 – Intermediate Sturgeon Package

Under Alternative 3, a subset of the time/area closures and gear restrictions under consideration in Alternative 2 for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas. This alternative is the intermediate alternative under consideration in terms of closures. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot area.

Time/area closures

The impacts of Alternative 3 time/area closures on non-target species (primarily winter skate) in the monkfish and spiny dogfish fisheries would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 4, and 5. Preliminary results from the DST analysis and sturgeon risk mapping show there are very similar percent sturgeon take reductions expected to percent gear removed. More specifically, for a 20-mile maximum distance for gear displaced from where the gear is currently

displaced, 7.4% of coastwide dogfish and monkfish is unable to be displaced, meaning 7.4% of gear would be predicted to be removed from the fisheries (see Table 42). For a 50-mile maximum distance for gear displaced, 1.8% of coastwide dogfish and monkfish is unable to be displaced (see Table 43). The gear that is not expected to be removed is expected to shift to other areas where there is existing monkfish and spiny dogfish fishing. A similar level of fishing effort is expected by the gear that is relocated outside the time/area closures. Because the risk of sturgeon interaction is spatially diffuse, effort shifts and gear redistributes to areas with the same risk of sturgeon encounters. Take reduction, and thus, any reduction in non-target species catch in the monkfish and spiny dogfish fisheries, is seen where gear is removed. This potential reduction in non-target species catch from monkfish and spiny dogfish gear removal is not expected to be substantial and not expected to lead to any catch overages.

Gear modifications

The impacts of Alternative 3 gear modifications on non-target species caught in the monkfish and spiny dogfish fisheries would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 4, and 5. In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to non-target species because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between winter skate catch (primary non-target species in the monkfish fishery) in the control and experimental low-profile gillnet gear. Additional information on this experimental low-profile gillnet gear is included in Alternative 2 rationale. Regarding spiny dogfish, it is expected that fishermen would adapt to the proposed overnight soak prohibitions to minimize loss of spiny dogfish catch, possibly by changing the areas they fish.

6.3.4 Alternative 4 – Less restrictive Sturgeon Package (Least Time/Area Closures and Gear Restrictions)

Under Alternative 4, only the most targeted time/area closures and gear restrictions under consideration for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas (Figure 5, Figure 6, Figure 7). This alternative has the fewest measures, based on times where observed sturgeon bycatch is the highest. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot area.

Time/area closures

The impacts of Alternative 4 time/area closures on non-target species (primarily winter skate) in the monkfish and spiny dogfish fisheries would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 4, and 5. Preliminary results from the DST analysis and sturgeon risk mapping show there are very similar percent sturgeon take reductions expected to percent gear removed. More specifically, for a 20-mile maximum distance for gear displaced from where the gear is currently displaced, 3% of coastwide dogfish and monkfish is unable to be displaced, meaning 3% of gear would be predicted to be removed from the fisheries (see Table 44). For a 50-mile maximum distance for gear displaced, 1.4% of coastwide dogfish and monkfish is unable to be displaced (see Table 45). The gear that is not expected to be removed is expected to shift to other areas where there is existing monkfish and spiny dogfish fishing. A similar level of fishing effort is expected by the gear that is relocated outside the time/area closures. Because the risk of sturgeon interaction is spatially diffuse, effort shifts and gear redistributes to areas with the same risk of sturgeon encounters. Take reduction, and thus, any reduction in non-target species catch in the monkfish and spiny dogfish fisheries, is seen where gear is removed.

This potential reduction in non-target species catch from monkfish and spiny dogfish gear removal is not expected to be substantial and not expected to lead to any catch overages.

Gear modifications

The impacts of Alternative 4 gear modifications on non-target species caught in the monkfish and spiny dogfish fisheries would likely be negligible to slight positive and would be negligible relative to Alternatives 1, 2, 3, and 5. In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to non-target species because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between winter skate catch (primary non-target species in the monkfish fishery) in the control and experimental low-profile gillnet gear. Additional information on this experimental low-profile gillnet gear is included in Alternative 2 rationale. Regarding spiny dogfish, it is expected that fishermen would adapt to the proposed overnight soak prohibitions to minimize loss of spiny dogfish catch, possibly by changing the areas they fish.

6.3.5 Alternative 5 – Gear-Only Sturgeon Package (Preferred Alternative)

Under Alternative 5, there would be gear restrictions for both the federal monkfish and spiny dogfish fisheries in several Atlantic sturgeon bycatch hotspot areas. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot polygon and in the Delaware/Maryland/Virginia bycatch hotspot area.

The impacts of Alternative 5 gear modifications on non-target species caught in the monkfish and spiny dogfish fisheries would likely be negligible and would be negligible relative to Alternatives 1, 2, 3, and 4. In the monkfish fishery, low-profile gillnet gear in the NJ area is expected to result in negligible impacts to non-target species because prior research studies conducted using this experimental gear in this fishery in this area found there was no significant difference between winter skate catch (primary non-target species in the monkfish fishery) in the control and experimental low-profile gillnet gear. Additional information on this experimental low-profile gillnet gear is included in Alternative 2 rationale. Regarding spiny dogfish, it is expected that fishermen would adapt to the proposed overnight soak prohibitions to minimize loss of spiny dogfish catch, possibly by changing the areas they fish. Sub-alternatives 5A and 5B would exempt a subset of the dogfish fishery using < 5.25” mesh from overnight soak prohibitions, which is only expected to change non-target species in a negligible way. As such, spiny dogfish soak-time limitations would not be expected to change the status of any non-target species in a more than negligible fashion.

6.4 IMPACTS ON PROTECTED RESOURCES

The Joint Framework alternatives are evaluated for their impacts on species protected under the Endangered Species Act (ESA) of 1973 and/or the Marine Mammal Protection Act (MMPA) of 1972. The current conditions of protected species are summarized in Table 9 and described in Section 5.3. The species that are more likely to be impacted by this action are described in Section 5.3.4 (e.g., sea turtles, large whales, and the five Atlantic sturgeon DPSs).

All ESA-listed species are in poor condition and any interaction (i.e., take) can negatively impact that species’ recovery. As a result, any action that may result in interactions of ESA-listed species, including actions that may reduce interactions, is likely to have some level of negative impact to these species.

Actions likely to have positive impacts on ESA-listed species include only those that contain specific measures to ensure no interactions or take (Table 37). None of the Joint Framework alternatives would ensure that interactions with ESA-listed species would not occur. Therefore, for each ESA-listed species described in Section 5.3.4, we considered the impact of each alternative relative to whether it would be more or less negative than each of the other alternatives.

The stock conditions for marine mammals not listed under the ESA varies by species; however, all need protection. For marine mammal stocks that have their potential biological removal (PBR) level reached or exceeded, some level of negative impacts would be expected from alternatives that result in the potential for interactions between fisheries and those stocks. For species that are at more sustainable levels (i.e., PBR levels have not been exceeded), alternatives not expected to change fishing behavior or effort relative to current operating conditions in the fishery may have some level of positive impacts by maintaining takes below the PBR level and approaching the zero-mortality rate goal (Table 7). All of the Joint Framework alternatives, with the exception of Alternative 1 (i.e., current operating conditions in the fishery), could change fishing behavior or effort. Some of the alternatives would likely reduce effort relative to current operating conditions. Therefore, for marine mammals not listed under the ESA, the impact of each alternative and the PBR level of the particular marine mammal were considered to inform whether the overall impact of the alternative would likely be positive or negative.

As described above, the Joint Framework alternatives are specific to federal fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) using gillnet gear with $\geq 10''$ mesh size in federal and/or state waters, and to vessels with a federal fishing permit targeting spiny dogfish in federal or state waters using gillnet gear with mesh size of 5 - $<10''$. Therefore, for this impacts analysis, only the impacts to protected species from gillnet gear used in the fisheries were considered. The impacts to protected species from other gear types used in the monkfish fishery and the spiny dogfish fishery were most recently described in the Environmental Assessment for Framework Adjustment 13 to the Monkfish Fishery Management Plan and the Environmental Assessment for the 2023 Spiny Dogfish Specifications and will not change as a result of any of the Joint Framework Alternatives.

Gear quantity, soak time, and area fished influence the extent to which the gillnet gear used to target monkfish and spiny dogfish overlap with the distribution of protected species. Additionally, vessels participating in the monkfish fishery or in the spiny dogfish fishery using gillnet gear must comply, where applicable, with the Harbor Porpoise Take Reduction Plan (HPTRP), the Bottlenose Dolphin Take Reduction Plan (BDTRP), and the Atlantic Large Whale Take Reduction Plan (ALWTRP), and with the sea turtle resuscitation guidelines. Therefore, consideration of the impacts to protected species from the Joint Framework alternatives also takes into account the take reduction plan measures that reduce the times when and areas where some protected species overlap with the gillnet gear used in the monkfish and spiny dogfish fisheries.

The impacts of each Joint Framework alternative were qualitatively analyzed by considering the available information for the marine distribution of each protected species, the areas where the management measures would be implemented, and considering the preliminary DST results for how gillnet effort might change in response to each of the Joint Framework alternatives (section 6.1.2). For the Atlantic sturgeon DPSs, the change in sturgeon takes (i.e., percentage of sturgeon bycatch reduction) that would occur (section 6.1.3) were also quantified. Based on the methods used for the analysis, Atlantic sturgeon are more diffuse in their marine range than expected as related to risk of bycatch in gillnet gear given the literature on sturgeon habitat, but the model is the same peer-reviewed model used to estimate sturgeon bycatch. As a result, a reduction in Atlantic sturgeon bycatch is seen primarily when gear is removed as a result of the closure alternatives because effort shifts would result in gear redistributing to areas with similar risk of sturgeon encounters. The diffuse risk pattern is likely driven by the relatively low observer coverage and low total observed takes, which create relatively high uncertainty when the takes that do occur and relative effort are evaluated by the risk model. However, the impact of the Joint Framework alternatives for the Atlantic sturgeon DPSs were considered quantitatively, using the percentage of

sturgeon bycatch reduction, and qualitatively based on the available literature that describes Atlantic sturgeon as having seasonal patterns of movement and distribution in marine waters. Finally, although each Atlantic sturgeon DPS is its own listed entity under the ESA, the impacts of each alternative to Atlantic sturgeon were considered, in general, because individuals of all five DPSs occur in the Mid-Atlantic and the bycatch modeling is not specific to individual DPS.

Effort from the SNE closure polygon is expected to shift east of the closure polygon, directly overlapping with areas of high density North Atlantic right whale habitat. The impact of such effort shifts under Alternatives 2, 3, and 4 for North Atlantic right whales is considered below.

Figure 36. North Atlantic right whale habitat relative to Southern New England bycatch polygon (closest to shore) and the South Island Restricted Area (further offshore).

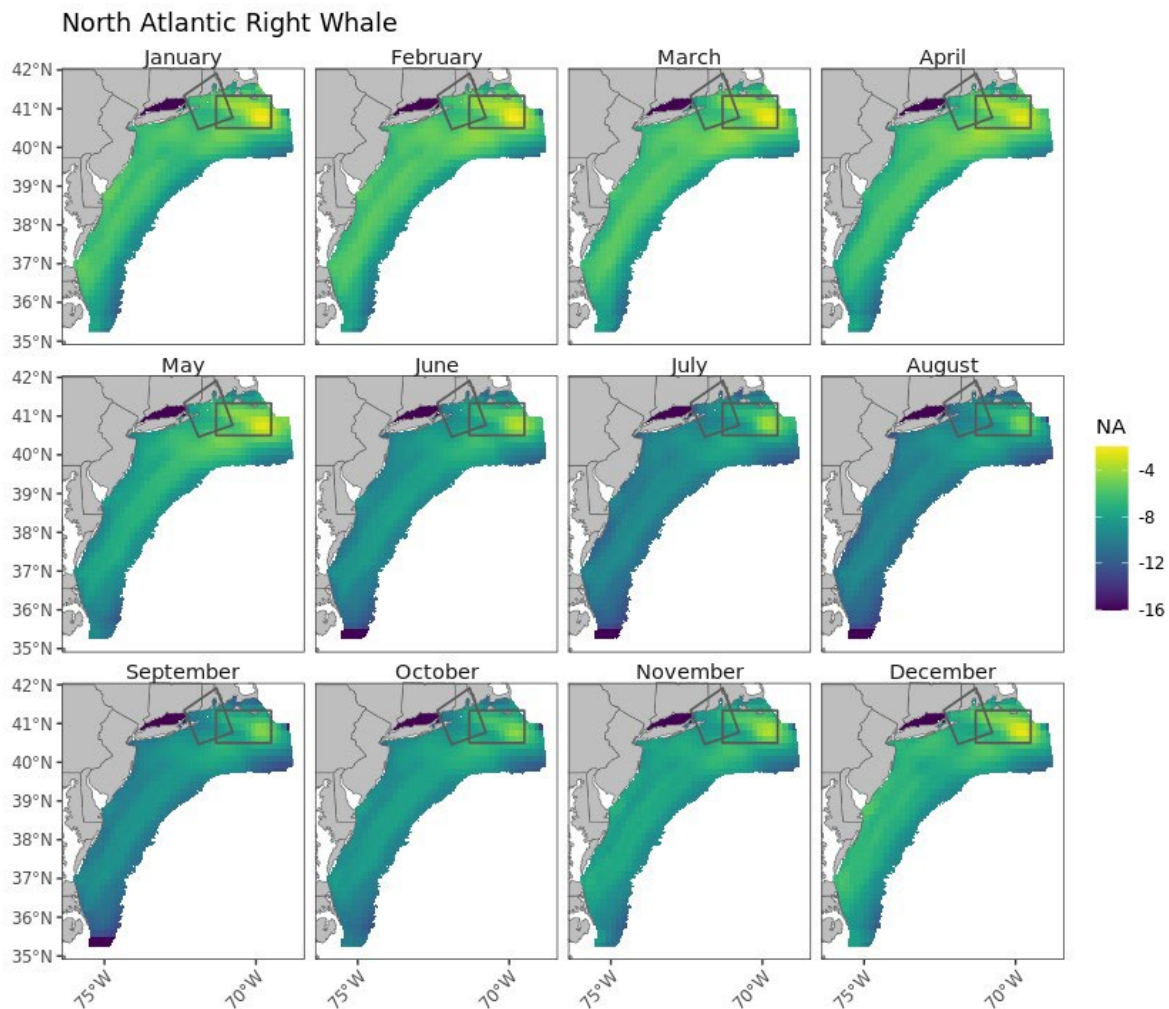
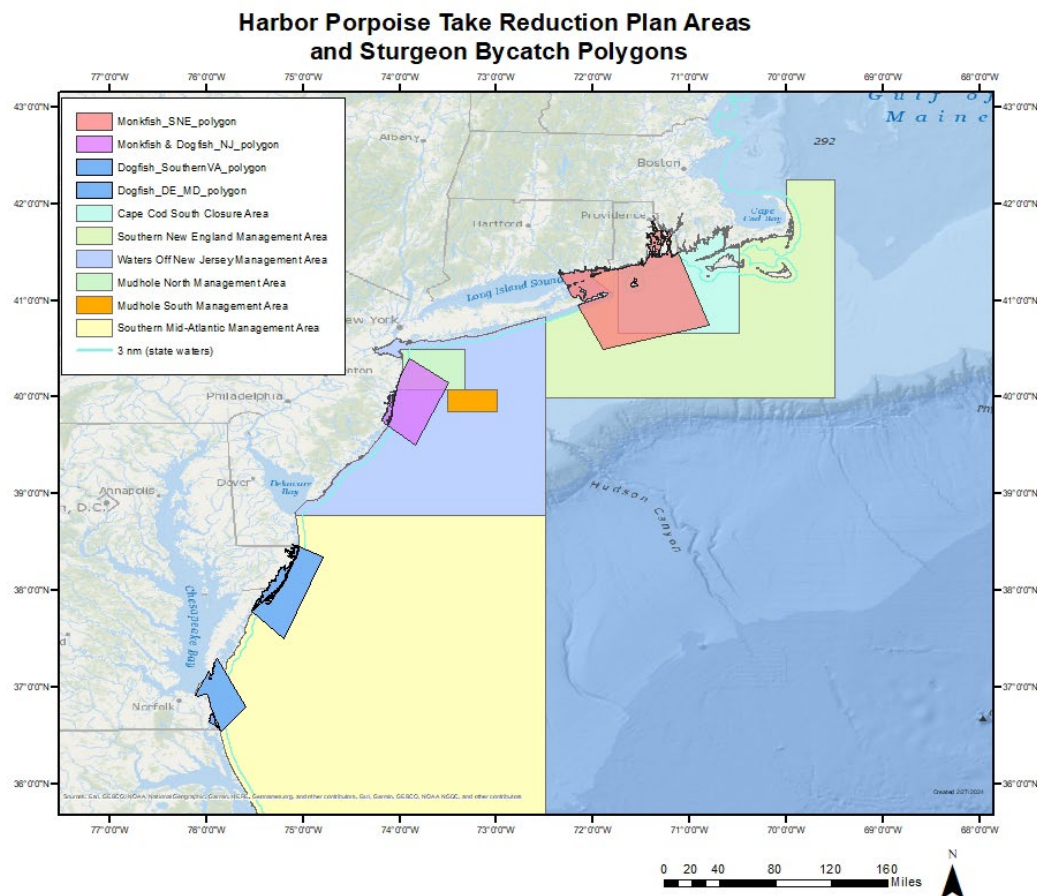


Figure 37. Harbor Porpoise Take Reduction Plan Areas overlapping and adjacent to the proposed sturgeon bycatch polygons.

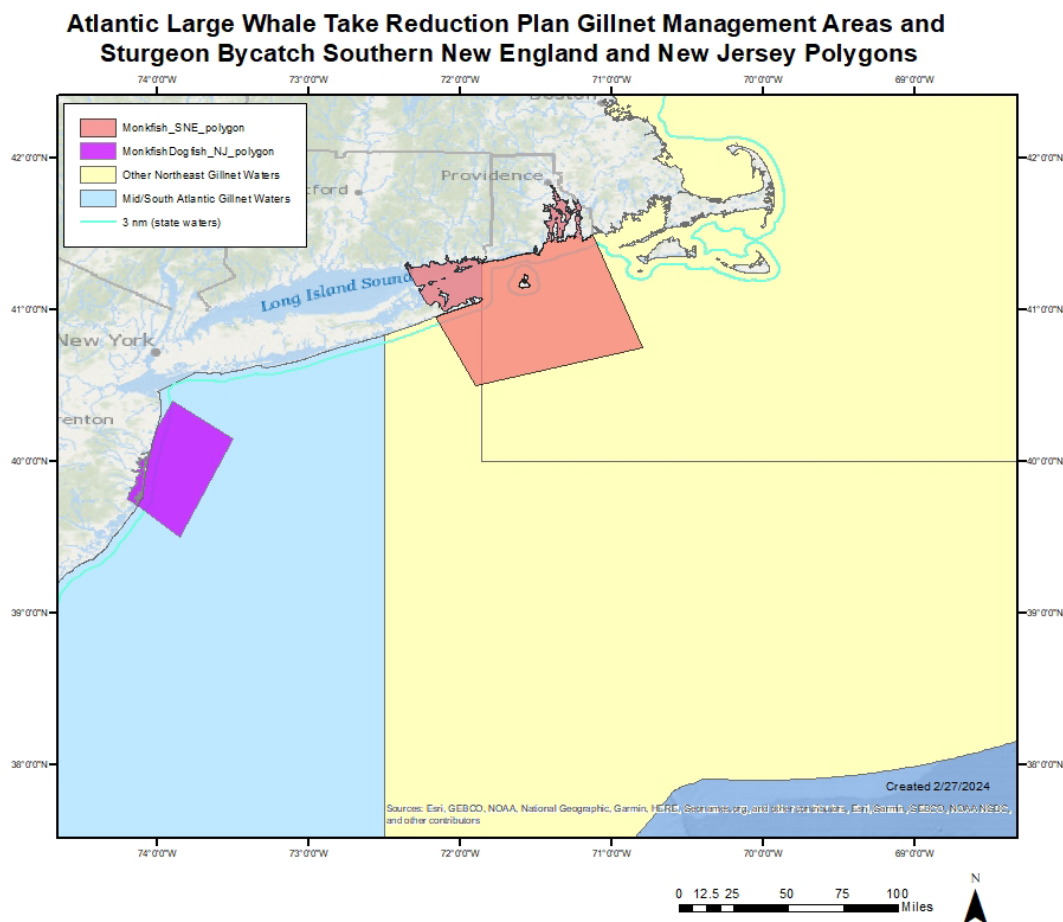


The SNE sturgeon bycatch hotspot polygon overlaps with the HPTRP's Southern New England Management Area (pingers required on gillnets December 1 – May 31) and overlaps in part with the Cape Cod South Closure Area (closed to gillnets in March). The NJ sturgeon bycatch hotspot polygon overlaps with the HPTRP's Waters off New Jersey Management Area, overlaps in part with the Mudhole North Management Area, and borders the Mudhole South Management Area (Figure 37). The DE/MA/VA sturgeon bycatch hotspot polygons overlap with the HPTRP's Southern Mid-Atlantic Management Areas. The requirements for these areas include closures and gear modifications for large mesh (defined under the HPTRP as 7–18-inch mesh) and small mesh gillnet gear (defined under the HPTRP as >5-<7-inch mesh) (Table 47). The HPTRP measures in the impacts section were considered with respect to how the measures add to or otherwise change the expected impacts of this action to Atlantic sturgeon and harbor porpoise.

Table 47. Harbor Porpoise Take Reduction Plan measures in relevant Management Areas.

Waters off New Jersey Management Area						
Large Mesh Gillnet Gear (7-18 inches)	Apr 1-20	Closed (No Large Mesh Gillnets)				
Large Mesh Gillnet Gear (7-18 inches)	Jan. 1-Mar. 31, Apr 21-30	Gear Modification Requirements				
Small Mesh Gillnet Gear (>5 inches - <7 inches)	Jan. 1-Apr 30	Gear Modification Requirements				
Mudhole North Management Area						
Large Mesh Gillnet Gear (7-18 inches)	Feb 15-Mar 15, Apr 1-20	Closed (No Large Mesh Gillnets)				
Large Mesh Gillnet Gear (7-18 inches)	Jan. 1-Feb 14, Mar 16-31, Apr 21-30	Gear Modification Requirements				
Small Mesh Gillnet Gear (>5 inches - <7 inches)	Feb 15-Mar 15	Closed (No Small Mesh Gillnets)				
Small Mesh Gillnet Gear (>5 inches - <7 inches)	Jan 1-Feb 14, Mar 16-Apr 30	Gear Modification Requirements				
Mudhole South Management Area						
Large Mesh Gillnet Gear (7-18 inches)	Feb 1-Mar 15, April 1-20	Closed (No Large Mesh Gillnets)				
Large Mesh Gillnet Gear (7-18 inches)	Jan 1-31, Mar 16-31, April 21-30	Gear Modification Requirements				
Small Mesh Gillnet Gear (>5 inches - <7 inches)	Feb 1-Mar 15	Closed (No Small Mesh Gillnets)				
Small Mesh Gillnet Gear (>5 inches - <7 inches)	Jan 1-31, Mar 16-Apr 30	Gear Modification Requirements				
Southern Mid-Atlantic Management Area						
Large Mesh Gillnet Gear (7-18 inches)	Feb 15-Mar 15	Closed (No Large Mesh Gillnets)				
Large Mesh Gillnet Gear (7-18 inches)	Feb 1-14, Mar 16-Apr 30	Gear Modification Requirements				
Small Mesh Gillnet Gear (>5 inches - <7 inches)	Feb 1- April 30	Gear Modification Requirements				
Large Mesh Gillnet Requirements						
Management Area	Floatline	Twine Size	Tie-downs	Net Size	Nets per vessel	Nets per String
Waters off NJ	4800 ft max	Min .90mm	Required No more than 24 ft apart in floatline No more than 48 inches from floatline to lead line	300 ft max	80 max	16 panels max
Mudhole North	3900 ft max					13 panels max
Mudhole South						
S Mid Atlantic						
Small Mesh Gillnet Requirements						
Management Area	Floatline	Twine Size	Tie-downs	Net Size	Nets per vessel	Nets per String
Waters off NJ	3000 ft max	Min .81mm	Prohibited	300 ft max	45 max	10 panels max
Mudhole N						
Mudhole S						7 panels max
S Mid Atlantic	2811 ft max					

Figure 38. Atlantic Large Whale Take Reduction Plan Gillnet Management Areas overlapping the proposed Southern New England and New Jersey sturgeon bycatch polygons.



Most of the SNE sturgeon bycatch hotspot polygon overlaps with the ALWTRP’s Northeast Gillnet waters, and the NJ and DE/MD/VA sturgeon bycatch hotspot polygons overlap with the ALWTRP’s Mid/South Atlantic Gillnet waters (Figure 38). The ALWTRP requirements for these areas include gear marking, use of weak links designed for the breaking strength of large whales, use of sinking groundlines, and no wet storage of gear (i.e., gear must be hauled once every 30 days). None of these measures will reduce the likelihood of sturgeon interactions with gillnet gear used in the monkfish and spiny dogfish fisheries given the differences in body size and, therefore, strength of Atlantic sturgeon compared to large whales. However, the ALWTRP measures in the impacts section were considered with respect to whether the measures would change the expected impacts of this action to large whales.

6.4.1 Alternative 1 – No Action

Under Alternative 1 (No Action), the current federal measures for the monkfish fishery and for the spiny dogfish fishery would remain – new measures to reduce sturgeon bycatch would not be implemented in 2024 through Council action.

The following impact analysis considers the information provided in section 5.3 and 6.4, as well as information provided in sections 5.5 and 6.1.1 to help inform expected fishing behavior/effort in the monkfish and spiny dogfish fisheries under No Action operating conditions. Additionally, as interaction risks with protected species are strongly associated with amount of gear in the water, the duration of time the gear is in the water (e.g., soak or tow duration), and the degree of overlap between gear and a protected species, with risk of an interaction increasing with increases in any of these factors, these factors will also be considered in the following evaluation of impacts to protected species.

General No-action: MMPA (Non-ESA Listed) Species Impacts

As provided in section 5.5, gillnet gear is one of the predominant gear types used to land monkfish and spiny dogfish in the monkfish and spiny dogfish fisheries. As provided in section 5.3, interactions with specific MMPA protected species (non-ESA listed) of small cetaceans, pinnipeds, and large whales have been observed or documented in gillnet gear. Based on this, the monkfish and spiny dogfish fisheries have the potential to impact these marine mammal species.

Aside from several stocks of bottlenose dolphin (i.e., WNA Northern and Southern Migratory Coastal Stocks of bottlenose dolphins), there has been no indication that takes of non-ESA listed marine mammals in commercial fisheries have gone beyond levels which would result in the inability of the populations to sustain themselves. Specifically, aside from the WNA Northern and Southern Migratory Coastal Stocks of bottlenose dolphins (both MMPA strategic stocks; section 6.4), the PBR level has not been exceeded for any of the non-ESA listed marine mammal species in the affected environment (section 6.4). Although the WNA Northern and Southern Migratory Coastal Stocks of bottlenose dolphin have experienced levels of take that have resulted in the exceedance of each species PBR level, the Bottlenose Dolphin Take Reduction Plan is in place to reduce bycatch in the fisheries affecting these species (refer to section 5.3). These efforts are still in place and are continuing to assist in decreasing bycatch levels for these stocks.

Taking into consideration the above information, and the fact that there are non-listed marine mammal stocks/species whose populations may or may not be at optimum sustainable levels, impacts of the No Action Alternative on non-ESA listed species of marine mammals are likely to range from slight negative to slight positive. As provided above, the WNA Northern and Southern Migratory Coastal Stocks of bottlenose dolphins are experiencing levels of interactions that have resulted in exceedance of their PBR levels. These stocks are not at an optimum sustainable level and therefore, the continued sustainability of these stocks is at risk. As a result, any potential for an interaction is a detriment to the species/stocks ability to recover from this condition. As the risk of an interaction is strongly associated with the amount of gear in the water, the duration of time the gear is in the water (e.g., soak duration), and the presence of protected species in the same area and time as the gear, with risk of an interaction increasing with increases in any of these factors. As provided in Section 5.3, the MMPA LOF's, as well as marine mammal stock assessment and serious injury reports that cover the most recent ten years of data (i.e., 2011-2020), interactions between gillnet gear and these stocks have been observed or documented. As fishing effort and behavior under Alternative 1/No Action is expected to remain similar to current operating conditions, the No Action Alternative is not expected to introduce new or elevated interaction risks to these non-ESA listed marine mammal stocks in poor condition. Specifically, the amount of gear in the water, gear soak duration, and the overlap between protected species and gillnet gear, in space and time, is not expected to change relative to current conditions. Given this information, and the information provided in section 5.3, the No Action Alternative is likely to result in negligible to slight negative impacts to non-ESA listed marine mammal stocks/species in poor condition (i.e., Bottlenose dolphin, WNA Northern and Southern Migratory Coastal Stocks).

Alternatively, there are also many non-ESA listed marine mammals that, even with continued fishery interactions, are maintaining an optimum sustainable level (i.e., PBR levels have not been exceeded) over the last several years. For these stocks/species, it appears that the fishery management measures that have been in place over this timeframe have resulted in levels and types of effort that result in interaction levels that are not expected to impair the stocks/species ability to remain at an optimum sustainable level. These fishery management measures, therefore, have resulted in indirect slight positive impacts to these non-ESA listed marine mammal species/stocks. Should future fishery management actions maintain similar operating condition as they have over the past several years, it is expected that these positive impacts would remain. Given this, the impacts of no action on these non-ESA listed species of marine mammals in good condition are expected to be negligible to slight positive (i.e., continuation of current operating conditions is not expected to result in exceedance of any of these stocks/species PBR level).

Based on the information above, the overall impacts of the No Action Alternative on non-ESA listed species of marine mammals are expected to be slight negative to slight positive.

General No-action: ESA Listed Species Impacts

ESA listed species of sea turtles, Atlantic sturgeon, large whales, and giant manta rays overlap with.... As provided in section 5.5, gillnet gear is one of the predominant gear types used to land monkfish and spiny dogfish in the monkfish and spiny dogfish fisheries. As provided in section 5.3, interactions with ESA-listed species have been observed or documented in gillnet gear. Based on this, the monkfish and spiny dogfish fisheries is likely to result in some level some level of negative impacts to ESA listed species.

As provided in the MMPA impacts section above, fishing effort and behavior under Alternative 1/No Action is expected to remain similar to current operating conditions. Specifically, the amount of gear in the water, gear soak duration, and the overlap between protected species and fishing gear (i.e., sink gillnet), in space and time, is not expected to change relative to current conditions. As interactions risks with protected species are strongly associated with amount, duration of time, and location of gear in the water, continuation of “status quo” fishing behavior/effort is not expected to change any of these operating conditions, and therefore, the No Action Alternative is not expected to introduce new or elevated interaction risks to ESA-listed species. Based on this, **the impacts of the No Action Alternative on ESA listed species is expected to slight negative.**

Overall Alternative 1 (No-action/status quo) Impacts to Protected Species

Based on the above protected species (i.e., ESA-listed and MMPA protected) impact analysis, overall impacts of the No Action Alternative on protected species are expected to be slight negative to slight positive

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Of the five alternatives considered in this Framework action, Alternative 1 is more negative for Atlantic sturgeon compared to Alternatives 2, 3, 4, and 5. With the exception of North Atlantic right whales (ESA-listed), relative Alternatives 2, 3, 4, and 5, Alternative 1 is expected to result in negligible to slightly more negative impacts to other ESA-listed species, and non-ESA listed species of marine mammals (both in good or poor condition). For North Atlantic right whales, given the potential for effort to shift to areas of SNE with observed high densities of North Atlantic right whales under Alternatives 2, 3, or 4, Alternative 1, relative to these alternatives, is expected to have negligible to slight positive impacts to this species. Relative to Alternative 5, Alternative 1 is expected to have negligible impacts to North Atlantic right whales.

6.4.2 Alternative 2 – Most restrictive Sturgeon Package (Most Time/Area Closures and Gear Restrictions)

Under Alternative 2, there would be a broad array of time/area closures and gear restrictions for both the federal monkfish and spiny dogfish gillnet fisheries in the Atlantic sturgeon bycatch polygons. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon. To understand the potential impacts of these measures on monkfish or spiny dogfish gillnet vessels, two gear displacement scenarios were considered in the DST, on considering a 20 mile maximum displacement from current fishing grounds, and the other considering 50 mile maximum displacement. Under the 20 mile scenario, the DST suggests that coastwide, approximately 8.4% of gear (measured in soak days) targeting monkfish and dogfish would be eliminated, while within the areas subject to the specified closures, 72% of the gear would be removed from these closure areas (i.e., eliminated) (see Table 40). Under the 50 mile scenario, approximately 1.9% of coastwide dogfish and monkfish gillnet gear will be removed, while within the areas subject to the specified closures, 16% of the gear would be removed (i.e., eliminated) from these closure areas (see Table 41). Taking into consideration modeling results, as well as industry feedback on the DST and the proposed measures (Section 6.1.2 and Appendix A), effort reduction under the 20 mile scenario are probably most reasonable; however, both scenarios will be considered in the following analysis to try to account for any potential uncertainties in the model.

Given the above, some reduction in gillnet effort is expected under Alternative 2, with the greatest level of effort reduction expected under the 20 mile relocation scenario (see section 6.1.2) relative to the 50 mile relocation scenario; effort shifts, rather than gear removal, are more likely under the 50 mile relocation scenario. In general, under the 20 mile or 50 mile relocation scenarios, for the NJ and DE/MD/VA sturgeon bycatch hotspot polygons, the DST predicts little to no shifts in gillnet effort, with model results indicating that gear is likely to be removed during the seasonal closures in these areas (Appendix A). For the SNE sturgeon bycatch hotspot polygon, effort would shift to the areas adjacent to the southern and eastern boundaries of the polygon for the April 1-May 31 period under both the 20-mile and 50-mile gear redistribution scenarios; however, relative to the 20 mile relocation scenario, the degree in which effort may shift is much greater under the 50 mile relocation scenario. As provided in section 6.1.1, monkfish and spiny dogfish fishing effort is seasonally focused in specific areas of SNE and the Mid-Atlantic. Review of Appendix A suggests that the extent of any predicted shift in effort is likely to occur within these existing areas. As a result, effort is not expected to be introduced into new portions of the resource area that have not already been fished by either fishery. Gear redistribution in SNE for the December 1-December 31 time period was predicted to be more limited with gear redistributing to the area adjacent to the southeastern corner of the polygon when considering a gear displacement of up to 20 miles, and gear redistributing to both the area adjacent to the southeastern corner of the polygon and the area adjacent to the southwestern corner of the polygon when considering a gear displacement of up to 50 miles.

Taking into consideration the above, as well as information provided in sections 6.1.1 and 6.1.2, overall, relative to the current fishing footprint of the monkfish and spiny dogfish fisheries, the predicted shifts in effort under Alternative 2 are not expected to result in significant changes to either fisheries existing footprint. As a result, any changes in overall fishing effort or behavior are expected to be slight, and therefore, significant changes in overlap between protected species and the fisheries is not expected. Specifically, as provided in section 6.1.2, although “more gear is removed from the closure areas, the relatively small amount of gear affected and the potential for displacement means that overall effort changes are slight. The change in location also generally should have slight effects (with the exception noted that for the Southern New England area as it relates to North Atlantic right whales, described below).” In addition, as provided in section 6.1.2, as it relates to gear modifications (e.g., low profile gillnet), negligible effort shifts in intensity or distribution are expected in either fishery. Industry feedback on this and the other proposed alternatives indicated that fishery participants would likely continue

operating within the bycatch hotspot polygons in compliance with the proposed measures. To avoid gear restrictions, fishery participants may remove their gear or some may displace effort to the boundaries of the polygons; however, these are expected to be outliers and overall effort should remain approximately similar, at least in terms of the effects of the proposed measures.

The occurrence and distribution of Atlantic sturgeon overlaps with the fishing footprint of the monkfish and spiny dogfish fishing footprints in SNE and the Mid-Atlantic, including those areas identified as a sturgeon bycatch hotspot polygon under Alternative 2. The results of the sturgeon bycatch reduction analysis indicate that Alternative 2 would reduce sturgeon bycatch by 13.3% or 4.2% coastwide based on gillnet gear shifting up to 20 miles or 50 miles, respectively, from where it is currently fished within each of the sturgeon bycatch hotspot polygons. The percent reductions could be greater if, as suggested by the literature, Atlantic sturgeon are less numerous in Mid-Atlantic waters beyond the 20m depth contour. A reduction of sturgeon bycatch would also result in a reduction in sturgeon bycatch mortality given that fewer fish would interact with gillnet gear and, therefore, be at risk of dying in the gear. However, this could be offset if shifts in effort result in longer soak times. If that were to occur, then bycatch mortality would remain the same or increase, overall, given the increased likelihood of sturgeon mortality with increasing soak time. The requirement to use low profile gillnet gear in the NJ sturgeon bycatch hotspot polygon beginning January 1, 2026, at times when the closure is not in effect is expected to reduce the number of sturgeon that are incidentally caught while retaining enough of the targeted catch. Reducing the capture of Atlantic sturgeon will also reduce sturgeon bycatch mortality resulting from capture in gillnet gear, particularly when soak time for the gear exceeds 16 hours. Given this, and the fact that under Alternative 2, significant changes to either fisheries existing footprint are not expected, impacts to Atlantic sturgeon are not expected to be any greater than current conditions. Given the expected, albeit slight, reduction in gillnet gear, as well as the use of low-profile gear, Alternative 2 may afford some benefits to Atlantic sturgeon by reducing the risk of entanglement, and any associated mortality. Based on this and the information above, although some reduction in entanglement risk to Atlantic sturgeon is expected under this Alternative, as interactions can still occur, Alternative 2 is expected to result in slight negative impacts to ESA-listed species of Atlantic sturgeon.

Each of the sturgeon bycatch hotspot polygons overlap in total or in part with management areas defined under the HPTRP that are also closed to large mesh (7-18-inch) and/or small mesh (>5-<7-inch) gillnet gear at certain times of the year. The closure time periods of this action do not overlap with the HPTRP closures. Therefore, for part of the SNE polygon, gillnet gear fished for the monkfish fishery would be prohibited from March 1-March 31 under the HPTRP, and from April 1-May 31 and December 1-December 31 under this alternative. Similarly, for the NJ sturgeon bycatch polygon, gillnet gear fished in the monkfish fishery would be prohibited from that part of the polygon that overlaps with the HPTRP Northern Mudhole Management Area from February 1-March 15 and April 1-April 20 under the HPTRP and from May 1-May 31 and October 15-December 31 under this alternative. Gillnet gear fished in the spiny dogfish fishery would be prohibited from that part of the NJ polygon that overlaps with the Northern Mudhole Management Area from January 1-February 14 under the HPTRP requirements, and from May 1-May 31 and October 15-December 31 under this alternative. The effects of the HPTRP requirements are already reflected in the current operation of the fishery. It is possible that the addition of the closures under this alternative to the HPTRP measures already in place could further change fishing behavior (e.g., choosing not to fish in a sturgeon bycatch hotspot polygon even when gillnet gear is not prohibited) that would change the impacts of this action for Atlantic sturgeon. However, we do not have information to inform whether fishing behavior might change.

ESA-listed sea turtles are seasonally present in waters from Maine to Virginia and therefore, seasonally overlap with the fishing footprint of the monkfish and spiny dogfish fisheries operating in SNE and the Mid-Atlantic, including those areas identified as a sturgeon bycatch hotspot polygon under Alternative 2. Sea turtles arrive in waters off Virginia in late April/early May and in the Gulf of Maine in June. They remain in some portion of these waters through November but the highest number of individuals are

present from June to October (NMFS 2021). Therefore, the SNE closure for December 1-December 31, and the closure of the DE/MD/VA closure areas from November-March 31 will have minimal impact on ESA-listed sea turtles because sea turtles are not expected to be present in the polygons or in the waters adjacent to the polygons where effort might shift during these time periods. A reduction in gillnet gear in the SNE and NJ closure areas in May, and in the NJ closure for October 15-December 31 would reduce the negative impacts to sea turtles of the monkfish and spiny dogfish fisheries as they currently operate by reducing the amount of gillnet gear in the water when sea turtles are or may be present. The use of low-profile gillnet gear in the NJ sturgeon bycatch hotspot polygon at times of the year when sea turtles are likely to be present is unlikely to negatively affect sea turtles because lowering the profile of the gear should help to reduce sea turtle interactions (section 5.3.5.1). Given this, and the fact that under Alternative 2, significant changes to either fisheries existing footprint are not expected, impacts to sea turtles are not expected to be any greater than current conditions. Given the expected, albeit slight, reduction in gillnet gear, as well as the use of low-profile gear, Alternative 2 may afford some benefits to sea turtles by reducing the risk of entanglement. Based on this and the information above, although some reduction in entanglement risk to sea turtles is expected under this Alternative, as interactions can still occur, Alternative 2 is expected to result in slight negative impacts to ESA-listed species of sea turtles.

The distribution of large whales (ESA-listed and MMPA protected) overlaps year round with the fishing footprint of the monkfish and the spiny dogfish fisheries (see section 6.1.1), including those areas identified as a sturgeon bycatch hotspot polygon under Alternative 2. In general, any reduction in gillnet effort benefits large whales given their risk of entanglement in this gear type. Therefore, given the relatively small coastwide reduction in gillnet gear, Alternative 2 may provide some benefit to large whales by reducing the risk of entanglement in gillnet gear. However, most of the SNE sturgeon bycatch hotspot polygon overlaps with the area where the ALWTRP requirements for Northeast Gillnet waters apply year-round, and the NJ and the DE/MD/VA polygons overlap with the area where the ALWTRP requirements for Mid/South Atlantic Gillnet waters apply from September 31-May 1. As a result, it is likely that Alternative 2 is only slightly less negative than Alternative 1 because the gillnet gear removed as a result of Alternative 2 should already have been following the ALWTRP requirements, and all remaining gear (e.g., gear fished adjacent to the polygons) will remain compliant with the ALWTRP gillnet regulations in these areas of SNE and the Mid-Atlantic. The shifts in gillnet gear predicted by the DST are unlikely to change the risk of interaction with large whales with one exception. Shifts in effort to the area adjacent to the southeastern boundary of the SNE polygon would potentially shift spring and winter gillnet effort into the southern New England habitat of North Atlantic right whales that was recently described by O'Brien et al. (2022) (Figure 36). Given the species dire status, shifting gillnet effort into areas where North Atlantic right whales aggregate would potentially increase the negative impacts to this species despite the ALWTRP requirements currently in place to reduce the likelihood of a right whale entanglement or the severity of an entanglement in gillnet gear. Taking into consideration the information provided above, and the fact that under Alternative 2, significant changes to either fisheries existing footprint are not expected, impacts to most protected species of large whales are not expected to be any greater than current conditions. Given the expected, albeit slight, reduction in gillnet gear, as well as the use of low-profile gear, Alternative 2 may afford some reduced entanglement risk, and therefore, provide some benefits to large whales. The one exception to this are North Atlantic right whales; should effort shifts occur, as suggested by the DST, into North Atlantic right whale aggregation areas of SNE, then interaction risks have the potential to increase for this ESA-listed species. Based on this and the information above, Alternative 2 is expected to have slight moderate negative to slight positive impacts to protected species of large whales, with slight negative to slight moderate negative impacts expected for ESA listed species of large whales, and slight negative to slight positive impacts for MMPA protected species (non-ESA listed) of large whales.

The distribution of the MMPA species (non-ESA listed small cetaceans and pinnipeds)(Table 7) overlaps with the fishing footprint of the monkfish and the spiny dogfish fisheries operating in SNE and the Mid-Atlantic. The extent of overlap varies depending on the species and its temporal presence in Southern

New England and the Mid-Atlantic. For example, gray seals can occur year round in waters off New Jersey and SNE, while harbor seals, harp seals, and hooded seals range widely, occurring seasonally in SNE and the Mid-Atlantic (see section 5.3).. Taking into consideration the information provided above, and the fact that under Alternative 2, significant changes to either fisheries existing footprint are not expected, impacts to non-ESA listed species of small cetaceans and pinnipeds are not expected to be any greater than current conditions. Given the expected, albeit slight, reduction in gillnet gear, as well as the use of low-profile gear, Alternative 2 may afford some reduced entanglement risk, and therefore, provide some benefits to these species. Based on this and the information above, although some reduction in entanglement risk to MMPA protected species (non-ESA) of small cetaceans and pinnipeds is expected under this Alternative, as interactions can still occur, Alternative 2 is expected to result in slight negative impacts to species of small cetaceans in poor conditions (i.e., Northern and Southern Migratory Coastal Stocks of Bottlenose Dolphins; section 5.3), and slight positive impacts to species of small cetaceans and pinnipeds in good condition.

Giant manta rays can occur as far north as New Jersey, and as a result, it is unlikely that this species will co-occur with the monkfish or spiny dogfish fishery operating in SNE. However, in the areas of the monkfish and spiny dogfish fishery operating in Mid-Atlantic waters from New Jersey, south, giant manta rays are likely to be sparsely distributed (see section 5.3). Based on this, albeit low, there is the potential that this species will overlap with either fishery, including the sturgeon bycatch hotspot polygons. Should giant manta rays co-occur with these fisheries, given documented interactions with gillnet gear, the slight reduction in gillnet gear expected under Alternative 2 may reduce the risk of interaction, and therefore provide some benefit to this species. Taking into consideration the information provided above, and the fact that under Alternative 2, significant changes to either fisheries existing footprint are not expected, impacts to giant manta rays are not expected to be any greater than current conditions. Given the expected, albeit slight, reduction in gillnet gear Alternative 2 may afford some reduced entanglement risk, and therefore, provide some benefits to this species. Based on this and the information above, although some reduction in entanglement risk to giant manta rays is expected under this Alternative, as interactions can still occur, Alternative 2 is expected to result in slight negative impacts to ESA-listed species of giant manta rays.

Taking into consideration the information provided above, Alternative 2 is expected to result in slight negative impacts to ESA-listed species of Atlantic sturgeon, sea turtles, and giant manta rays. For protected (ESA-listed and/or MMPA protected) species of large whales, impacts are expected to range slight moderate negative to slight positive, with slight negative to slight moderate negative impacts expected for ESA listed species of large whales, and slight negative to slight positive impacts for MMPA protected species (non-ESA listed) of large whales. For MMPA protected species (non-ESA listed) of small cetaceans and pinnipeds, impacts are expected to be slight negative for small cetaceans in poor conditions (i.e., Northern and Southern Migratory Coastal Stocks of Bottlenose Dolphins; section 5.3), and slight positive impacts to small cetaceans and pinnipeds in good condition.

Relative to Alternative 1, Alternative 2 is expected to have negligible to slight moderate positive impacts to ESA-listed species of Atlantic sturgeon, and negligible to slight positive impacts to ESA-listed species of sea turtles and giant manta rays. In regards to large whales, relative to Alternative 1, Alternative 2 is expected to result in slight positive to slight moderate negative impacts to these species, with negligible to slight positive impacts expected for all protected species of large whales, except for ESA-listed species of North Atlantic right whales; for North Atlantic right whales, depending on potential effort shifts in SNE, impacts to this listed species could range from slight positive to slight moderate negative. For MMPA protected species (non-ESA listed) of small cetaceans and pinnipeds, relative to Alternative 1, Alternative 2 is expected to have negligible to slight moderate positive impacts to these species.

Alternatives 2, 3, and 4 designate the same closure areas, with similar closure timeframes; as well as implement gear modifications to reduce bycatch and/or mortality of Atlantic sturgeon. Given these similarities, and similarities in expected changes in fishing behavior and effort under each Alternative, relative to Alternatives 3 and 4, the impacts of Alternative 2 on protected species (ESA-listed or MMPA protected) of sea turtles, large whales, small cetaceans and pinnipeds, and giant manta rays, are expected to be negligible.

In regards to Atlantic sturgeon, weighing the differences in impacts between Alternatives 2 through 4 are difficult given similarities in the measures specified under each. As a result, to better elucidate the potential differences in impacts between alternatives, we evaluated each Alternative's potential to reduce bycatch mortality. In the monkfish fishery, Alternatives 2 through 4 implement seasonal closures in SNE that will aid in reducing bycatch mortality, with Alternative 2 implementing the longest seasonal closure windows in SNE relative to Alternatives 3 or 4. Under Alternative 2, the closures of the NJ polygon (monkfish and spiny dogfish fishery) and the DE/MD/VA (spiny dogfish fishery) polygons to gillnet gear fished would eliminate the likelihood of Atlantic sturgeon bycatch mortality in these areas for the respective time periods. However, in addition to these seasonal closures, in NJ and DE/MD/VA, the seasonal prohibition on overnight soaks in NJ (spiny dogfish fishery) under Alternatives 3 and 4 would likewise eliminate the likelihood of sturgeon bycatch mortality even though interactions would still occur. Therefore, even when just considering the measures under the spiny dogfish fishery and the combined effect of closures and the prohibition on overnight soaks, Alternative 2 affords more benefits to Atlantic sturgeon, specifically, an additional 10 weeks of sturgeon bycatch mortality reduction compared to Alternative 3, and an additional 14 weeks compared to Alternative 4. Based on this, relative to Alternatives 3 and 4, Alternative 2 is expected to result in negligible to moderate positive impacts to ESA-listed species of Atlantic sturgeon.

Relative to Alternative 5, which will not incorporate any seasonal closures, but will implement some gear modifications, Alternative 2 is expected to result in negligible to slight positive impacts on protected species (ESA-listed or MMPA protected) of sea turtles, large whales (except North Atlantic right whales) small cetaceans, pinnipeds, and giant manta rays. However, with no seasonal closures specified under Alternative 5, potential shifts in effort into regions of SNE where North Atlantic right whales are known to aggregate are not expected under this Alternative. As a result, relative to Alternative 5, Alternative 2 is expected to result negligible to slight moderate negative impacts to North Atlantic rights. For Atlantic sturgeon, to better elucidate the potential differences in impacts between alternatives 2 and 5, we evaluated each Alternative's potential to reduce bycatch mortality. In the monkfish fishery, Alternatives 2 implements seasonal closures in SNE (monkfish fishery), NJ (monkfish and spiny dogfish fishery) and the DE/MD/VA (spiny dogfish fishery) polygons to gillnet gear fished; these measures would eliminate the likelihood of Atlantic sturgeon bycatch mortality in these areas for the respective time periods. Although Alternative 5 does not implement seasonal closures, it does specify the prohibition of overnight soaks in the spiny dogfish fishery in the NJ and DE/MD/VA polygons over specified periods of time; this would reduce the likelihood of sturgeon bycatch mortality even though interactions would still occur. Therefore, when looking at the combined effect of closures and/or the prohibition on overnight soaks, Alternative 2 would afford more sturgeon mortality reduction compared to Alternative 5. As a result, relative to Alternatives 5, Alternative 2 is expected to result in negligible to slight moderate positive impacts to ESA-listed species of Atlantic sturgeon.

6.4.3 Alternative 3 – Intermediate Sturgeon Package

Under Alternative 3, there would be fewer seasonal closures of the same areas considered in Alternative 2, but closures would still be implemented during the months with the highest observed sturgeon bycatch (i.e., May and December for the Southern New England Atlantic sturgeon bycatch hotspot polygon, and December for the New Jersey bycatch hotspot polygon). Alternative 3 would also require the use of low-

profile gillnet gear in the monkfish fishery when fishing in the New Jersey bycatch hotspot polygon January through November beginning January 1, 2026. Vessels with a federal fishing permit targeting spiny dogfish would be prohibited from soaking gear overnight from 8pm until 5am in the New Jersey bycatch hotspot polygon during May 1- May 31.

To understand the potential impacts of these measures on monkfish or spiny dogfish gillnet vessels, two gear displacement scenarios were considered in the DST, on considering a 20 mile maximum displacement from current fishing grounds, and the other considering 50 mile maximum displacement. Under the 20 mile scenario, the DST suggests that coastwide, approximately 7.4% of gear (measured in soak days) targeting monkfish and dogfish would be eliminated, while within the areas subject to the specified closures, 74% of the gear would be removed from these closure areas (i.e., eliminated) (see Table 42). Under the 50 mile scenario, approximately 1.8% of coastwide dogfish and monkfish gillnet gear will be removed, while within the areas subject to the specified closures, 18% of the gear would be removed (i.e., eliminated) from these closure areas (see Table 43). Taking into consideration modeling results, as well as industry feedback on the DST and the proposed measures (Section 6.1.2 and Appendix A), effort reduction under the 20 mile scenario are probably most reasonable; however, both scenarios will be considered in the following analysis to try to account for any potential uncertainties in the model.

Given the above, some reduction in gillnet effort is expected under Alternative 3, with a greatest level of effort reduction expected under the 20 mile relocation scenario (see section 6.1.2) relative to the 50 mile relocation scenario; effort shifts, rather than gear removal, are more likely under the 50 mile relocation scenario. In general, under the 20 mile or 50 mile relocation scenario, for the NJ and DE/MD/VA sturgeon bycatch hotspot polygons, the DST predicts that gillnet effort will shift to areas immediately adjacent to the polygons (all boundaries other than the landward boundary) with a more extensive shift predicted when considering gear displacement up to 50 miles from where it currently occurs compared to gear displacement of up to 20 miles from where it currently occurs. For the SNE sturgeon bycatch hotspot polygon, effort would shift to the areas adjacent to the southern and eastern boundaries of the polygon for the May 1-May 31 period under both the 20-mile and 50-mile gear redistribution scenarios; however, relative to the 20 mile relocation scenario, the degree in which effort may shift is much greater under the 50 mile relocation scenario. As provided in section 6.1.1, monkfish and spiny dogfish fishing effort is seasonally focused in specific areas of SNE and the Mid-Atlantic. Review of Appendix A suggests that the extent of any predicted shift in effort is likely to occur within these existing areas. As a result, effort is not expected to be introduced into new portions of the resource area that have not already been fished by either fishery. Gear redistribution in SNE for the December 1-December 31 time period was predicted to be more limited with gear redistributing to the area adjacent to the southeastern corner of the polygon when considering a gear displacement of up to 20 miles, and gear redistributing to both the area adjacent to the southeastern corner of the polygon and the area adjacent to the southwestern corner of the polygon when considering a gear displacement of up to 50 miles.

Taking into consideration the above, as well as information provided in sections 6.1.1 and 6.1.2, overall, relative to the current fishing footprint of the monkfish and spiny dogfish fisheries, the predicted shifts in effort under Alternative 3 are not expected to result in significant changes to either fisheries existing footprint. As a result, any changes in overall fishing effort or behavior are expected to be slight, and therefore, significant changes in overlap between protected species and the fisheries is not expected. Specifically, as provided in section 6.1.2, although “more gear is removed from the closure areas, the relatively small amount of gear affected and the potential for displacement means that overall effort changes are slight. The change in location also generally should have slight effects (with the exception noted that for the Southern New England area as it relates to North Atlantic right whales, described below).” In addition, as provided in section 6.1.2, as it relates to gear modifications (e.g., low profile gillnet), negligible effort shifts in intensity or distribution are expected in either fishery. Industry feedback on this and the other proposed alternatives indicated that fishery participants would likely continue operating within the bycatch hotspot polygons in compliance with the proposed measures. To avoid gear

restrictions, fishery participants may remove their gear or some may displace effort to the boundaries of the polygons; however, these are expected to be outliers and overall effort should remain approximately similar, at least in terms of the effects of the proposed measures.

The occurrence and distribution of Atlantic sturgeon overlaps with the fishing footprint of the monkfish and spiny dogfish fishing footprints in SNE and the Mid-Atlantic, including those areas identified as a sturgeon bycatch hotspot polygon under Alternative 3. The results of the sturgeon bycatch reduction analysis indicate that Alternative 3 would reduce sturgeon bycatch by 10.6% or 3.2% coastwide based on gillnet gear shifting up to 20 miles or 50 miles, respectively, from where it is currently fished within each of the sturgeon bycatch hotspot polygons. The percent reductions could be greater if, as suggested by the literature, Atlantic sturgeon are less numerous in Mid-Atlantic waters beyond the 20m depth contour. A reduction of sturgeon bycatch should also reduce sturgeon bycatch mortality, given that fewer fish would interact with gillnet gear and be at risk of dying in the gear. However, this could be offset if shifts in effort result in longer soak times. If that were to occur, then bycatch mortality would remain the same or increase, overall, given the increased likelihood of sturgeon mortality with increasing soak time. The requirement to use low profile gillnet gear in the NJ sturgeon bycatch hotspot polygon beginning January 1, 2026, for all months except December is expected to reduce the number of sturgeon that are incidentally caught while retaining enough of the targeted catch.

The overnight soak prohibition from May 1- May 31 for vessels with a federal fishing permit targeting spiny dogfish in the NJ bycatch hotspot polygon is likewise expected to reduce the amount of sturgeon bycatch although the extent of bycatch reduction is uncertain. More importantly, the overnight soak prohibition would effectively eliminate the likelihood of sturgeon mortality in the gear in all but exceptional circumstances. The majority of observed Atlantic sturgeon that are captured in gillnet gear targeting spiny dogfish are alive when the gear is hauled (Figure 39, Table 48). Nevertheless, any mortality negatively impacts endangered Atlantic sturgeon. To inform this impacts analysis we, therefore, focused on the number of sturgeon found alive in gear that was soaked for < 24 hours. Data collected for gear that was soaked for more than 24 hours is less informative because there is no way of knowing when the sturgeon was captured in the gear. Based on preliminary analysis of observer data (2015-2022 with dogfish as target 1 and target 2 species), no Atlantic sturgeon have died when captured in gillnet gear targeting spiny dogfish that was soaked for less than 16 hours. Therefore, the overnight soak prohibition would reduce mortality of Atlantic sturgeon compared to current operation of the fishery. Taking into consideration this, and the fact that under Alternative 3, significant changes to either fisheries existing footprint are not expected, impacts to Atlantic sturgeon are not expected to be any greater than current conditions. Given the expected, albeit slight, reduction in gillnet gear, as well as the use of low-profile gear and implantation of an overnight soak prohibition in the spiny dogfish fishery, Alternative 3 may afford some benefits to Atlantic sturgeon by reducing the risk of entanglement, and any associated mortality. Based on this and the information above, although some reduction in entanglement and mortality risk to Atlantic sturgeon is expected under this Alternative, as interactions can still occur, Alternative 3 is expected to result in slight negative impacts to ESA-listed species of Atlantic sturgeon.

Each of the sturgeon bycatch hotspot polygons overlap in total or in part with management areas defined under the HPTRP that are also closed to large mesh (7-18-inch) and/or small mesh (>5-<7-inch) gillnet gear at certain times of the year. The closure time periods of this action do not overlap with the HPTRP closures. Therefore, for part of the SNE polygon, gillnet gear fished for the monkfish fishery would be prohibited from March 1-March 31 under the HPTRP, and from May 1-May 31 and December 1-December 31 under this alternative. Similarly, for the NJ sturgeon bycatch polygon, gillnet gear fished in the monkfish fishery would be prohibited from that part of the polygon that overlaps with the HPTRP Northern Mudhole Management Area from February 1-March 15 and April 1-April 20 under the HPTRP and from May 1-May 31 and December 1-December 31 under this alternative. Gillnet gear fished in the spiny dogfish fishery would be prohibited from that part of the NJ polygon that overlaps with the

Northern Mudhole Management Area from January 1- February 14 under the HPTRP requirements, and from November 1-December 31 under this alternative. The effects of the HPTRP requirements are already reflected in the current operation of the fishery. It is possible that the addition of the closures under this alternative to the HPTRP measures already in place could further change fishing behavior (e.g., choosing not to fish in a sturgeon bycatch hotspot polygon even when gillnet gear is not prohibited) that would change the impacts of this action for Atlantic sturgeon. However, we do not have information to inform whether fishing behavior might change.

As described in Alternative 2, section 6.4.2, the distribution and occurrence of protected (ESA-listed and/or MMPA protected) species of sea turtles, large whales, small cetaceans, pinnipeds, and giant manta rays overlaps with the fishing footprint of the monkfish and spiny dogfish fisheries operating in SNE and the Mid-Atlantic, including those areas identified as a sturgeon bycatch hotspot polygon under Alternative 3. As fishing behavior and effort, as well as the seasonal time/area closures and gear modifications specified under Alternative 3 are similar to those provided under Alternative 2, the impacts of Alternative 3 on protected species of sea turtles, large whales, small cetaceans, pinnipeds, and giant manta rays are expected to be similar to those provided under Alternative 2. As a result, Alternative 3 is expected to result in slight negative impacts to ESA-listed species sea turtles, and giant manta rays. For protected species (ESA-listed and MMPA protected) of large whales, impacts are expected to range slight moderate negative to slight positive, with slight negative to slight moderate negative impacts expected for ESA listed species of large whales, and slight negative to slight positive impacts for MMPA protected species (non-ESA listed) of large whales. For MMPA protected species (non-ESA listed) of small cetaceans and pinnipeds, impacts are expected to be slight negative for small cetaceans in poor conditions (i.e., Northern and Southern Migratory Coastal Stocks of Bottlenose Dolphins; section 5.3), and slight positive impacts to small cetaceans and pinnipeds in good condition. For additional information and rationale supporting these determinations, refer to Alternative 2, section 6.4.2.

Relative to Alternative 1, Alternative 3 is expected to have negligible to slight moderate positive impacts to ESA-listed species of Atlantic sturgeon, and negligible to slight positive impacts to ESA-listed species of sea turtles and giant manta rays. In regards to large whales, relative to Alternative 1, Alternative 3 is expected to result in slight positive to slight moderate negative impacts to these species, with negligible to slight positive impacts expected for all protected species of large whales, except for ESA-listed species of North Atlantic right whales; for North Atlantic right whales, depending on potential effort shifts in SNE, impacts to this listed species could range from slight positive to slight moderate negative. For MMPA protected species (non-ESA listed) of small cetaceans and pinnipeds, relative to Alternative 1, Alternative 3 is expected to have negligible to slight moderate positive impacts to these species.

Alternatives 2, 3, and 4 designate the same closure areas, with similar seasonal closure timeframes. These alternatives also implement gear modifications and/or overnight soak prohibitions in the spiny dogfish fishery. Given these similarities, and similarities in expected changes in fishing behavior and effort under each Alternative, relative to Alternatives 2 and 4, the impacts of Alternative 3 on protected species (ESA-listed or MMPA protected) of sea turtles, large whales, small cetaceans and pinnipeds, and giant manta rays, are expected to be negligible.

In regards to Atlantic sturgeon, weighing the differences in impacts between Alternatives 2 through 4 are difficult given similarities in the measures specified under each. As a result, to better elucidate the potential differences in impacts between alternatives, we evaluated each Alternative's potential to reduce bycatch mortality. In the monkfish fishery, Alternatives 2 through 4 implement seasonal closures in SNE that will aid in reducing bycatch mortality, with Alternative 2 implementing the longest seasonal closure windows in SNE relative to Alternatives 3 or 4. Under Alternative 2, the closures of the NJ polygon (monkfish and spiny dogfish fishery) and the DE/MD/VA (spiny dogfish fishery) polygons to gillnet gear fished would eliminate the likelihood of Atlantic sturgeon bycatch mortality in these areas for the

respective time periods. However, in addition to these seasonal closures, in NJ and DE/MD/VA, the seasonal prohibition on overnight soaks in NJ (spiny dogfish fishery) under Alternatives 3 and 4 would likewise eliminate the likelihood of sturgeon bycatch mortality even though interactions would still occur. Given the above, and considering the seasonal duration of each closure and/or overnight soak prohibition under each Alternative, Alternative 3 affords the least reduction in sturgeon bycatch mortality relative to Alternative 2, and just a few additional weeks of sturgeon bycatch mortality reduction relative to Alternative 4. For instance, just considering the measures in the spiny dogfish fishery indicates that Alternative 3 would afford approximately 24 weeks of sturgeon bycatch mortality reduction in the spiny dogfish fishery which is less than what would occur under Alternatives 2 (i.e., approximately 35 weeks of sturgeon bycatch mortality reduction), but slightly greater than what would occur under Alternative 4 (i.e., approximately 20 weeks of sturgeon bycatch mortality reduction). Based on this, relative to Alternative 4, Alternative 3 is expected to result in negligible to slight positive impacts to Atlantic sturgeon, and relative to Alternative 2, Alternative 3 is expected to result in negligible to slight negative impacts to Atlantic sturgeon.

Relative to Alternative 5, which will not incorporate any seasonal closures, but will implement some gear modifications, Alternative 3 is expected to result in negligible to slight positive impacts on protected species (ESA-listed or MMPA protected) of sea turtles, large whales (except North Atlantic right whales) small cetaceans, pinnipeds, and giant manta rays. However, with no seasonal closures specified under Alternative 5, potential shifts in effort into regions of SNE where North Atlantic right whales are known to aggregate are not expected under this Alternative. As a result, relative to Alternative 5, Alternative 3 is expected to result negligible to slight moderate negative impacts to North Atlantic rights. For Atlantic sturgeon, to better elucidate the potential differences in impacts between alternatives 3 and 5, we evaluated each Alternative's potential to reduce bycatch mortality. In the monkfish fishery, Alternatives 3 implements seasonal closures in SNE (monkfish fishery), NJ (monkfish and spiny dogfish fishery) and the DE/MD/VA (spiny dogfish fishery) polygons to gillnet gear fished; these measures would eliminate the likelihood of Atlantic sturgeon bycatch mortality in these areas for the respective time periods. Although Alternative 5 does not implement seasonal closures, it does specify the prohibition of overnight soaks in the spiny dogfish fishery in the NJ and DE/MD/VA polygons over specified periods of time; this would reduce the likelihood of sturgeon bycatch mortality even though interactions would still occur. Therefore, when looking at the combined effect of closures and/or the prohibition on overnight soaks, Alternative 3 would afford slightly less sturgeon bycatch mortality reduction compared to Alternative 5. For instance, just considering the measures in the spiny dogfish fishery indicates that Alternative 3 would afford approximately 24 weeks of sturgeon bycatch mortality reduction in the spiny dogfish fishery which is less than what would occur under Alternatives 5 (i.e., approximately 28 weeks of sturgeon bycatch mortality reduction). As a result, relative to Alternatives 5, Alternative 3 is expected to result in negligible to slight negative impacts to ESA-listed species of Atlantic sturgeon.

Figure 39. Observed Atlantic sturgeon caught in gillnet gear ≥ 5 - <7-inch mesh and <5-inch mesh with spiny dogfish as the target species (sturgeon condition as alive, dead, or unknown) for 2017-2019 and 2021-2022. Data source: Observer data pulled Jan. 2024.

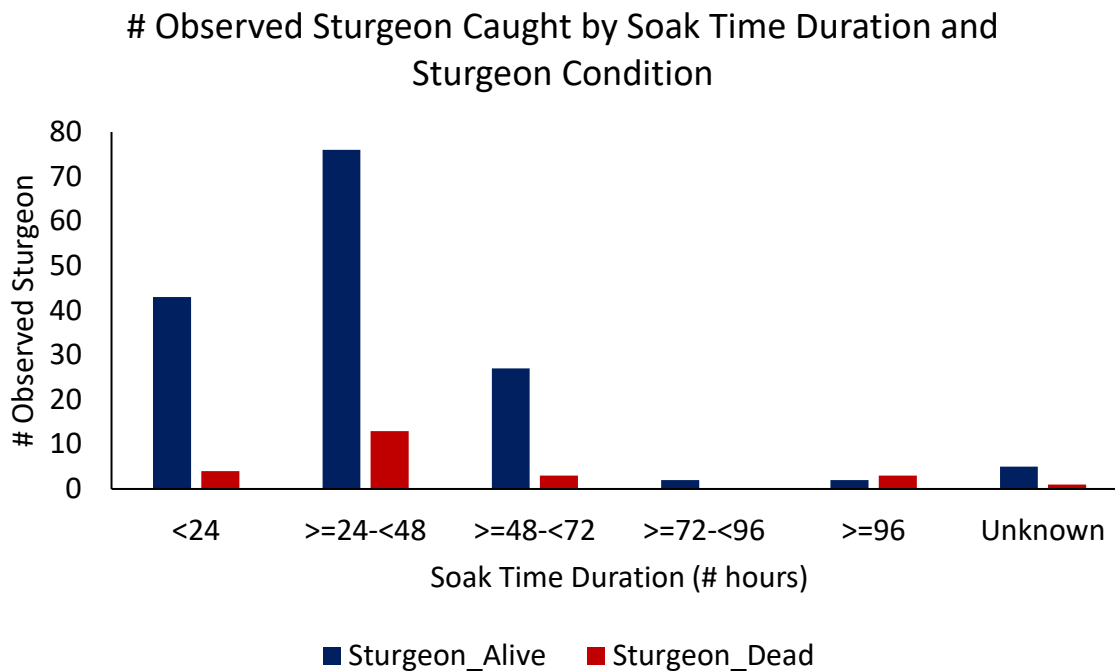


Table 48. Number of sturgeon caught alive and dead based on soak time duration in gillnet gear ≥ 5 - <7-inch mesh and <5-inch mesh with spiny dogfish as the target species. Data source: observer data pulled Jan. 2024.

Soak Time Duration	# Sturgeon Caught Alive	# Sturgeon Caught Dead	Total # of Sturgeon Caught	% Dead Sturgeon
<24	43	4	47	9%
≥ 24	112	20	132	15%

6.4.4 Alternative 4 – Less restrictive Sturgeon Package (Least Time/Area Closures and Gear Restrictions)

Under Alternative 4, only the most targeted time/area closures and gear restrictions would be implemented in the Atlantic sturgeon bycatch hotspot areas. Relative to Alternatives 2 and 3, this equates to the shortest seasonal closure timeframes that have been proposed. Alternative 4 would also require the use of low-profile gillnet gear in the monkfish fishery when fishing in the New Jersey bycatch hotspot polygon during the month of December, starting January 1, 2026. Vessels with a federal fishing permit targeting spiny dogfish would be prohibited from soaking gear overnight from 8pm until 5am in the New Jersey bycatch hotspot polygon during December 1-December 31 and May 1- May 31.

To understand the potential impacts of these measures on monkfish or spiny dogfish gillnet vessels, two gear displacement scenarios were considered in the DST, on considering a 20 mile maximum displacement from current fishing grounds, and the other considering 50 mile maximum displacement. Under the 20 mile scenario, the DST suggests that coastwide, approximately 3.0% of gear (measured in

soak days) targeting monkfish and dogfish would be eliminated, while within the areas subject to the specified closures, 79% of the gear would be removed from these closure areas (i.e., eliminated) (see Table 44). Under the 50 mile scenario, approximately 1.4% of coastwide dogfish and monkfish gillnet gear will be removed, while within the areas subject to the specified closures, 37% of the gear would be removed (i.e., eliminated) from these closure areas (see Table 44). Taking into consideration modeling results, as well as industry feedback on the DST and the proposed measures (Section 6.1.2 and Appendix A), effort reduction under the 20 mile scenario are probably most reasonable; however, both scenarios will be considered in the following analysis to try to account for any potential uncertainties in the model.

Given the above, some reduction in gillnet effort is expected under Alternative 3, with a greatest level of effort reduction expected under the 20 mile relocation scenario (see section 6.1.2) relative to the 50 mile relocation scenario; effort shifts, rather than gear removal, are more likely under the 50 mile relocation scenario. In general, under the 20 mile or 50 mile relocation scenario, for the NJ and DE/MD/VA sturgeon bycatch hotspot polygons, the DST predicts that gillnet effort will shift to areas immediately adjacent to the polygons (all boundaries other than the landward boundary) with a more extensive shift predicted when considering gear displacement up to 50 miles from where it currently occurs compared to gear displacement of up to 20 miles from where it currently occurs. For the SNE sturgeon bycatch hotspot polygon, gear redistribution for the December 1-December 31 time period was predicted to be more limited with gear redistributing to the area adjacent to the southeastern corner of the polygon when considering a gear displacement of up to 20 miles, and gear redistributing to both the area adjacent to the southeastern corner of the polygon and the area adjacent to the southwestern corner of the polygon when considering a gear displacement of up to 50 miles. As provided in section 6.1.1, monkfish and spiny dogfish fishing effort is seasonally focused in specific areas of SNE and the Mid-Atlantic. Review of Appendix A suggests that the extent of any predicted shift in effort is likely to occur within these existing areas. As a result, effort is not expected to be introduced into new portions of the resource area that have not already been fished by either fishery.

Taking into consideration the above, as well as information provided in sections 6.1.1 and 6.1.2, overall, relative to the current fishing footprint of the monkfish and spiny dogfish fisheries, the predicted shifts in effort under Alternative 4 are not expected to result in significant changes to either fisheries existing footprint. As a result, any changes in overall fishing effort or behavior are expected to be slight, and therefore, significant changes in overlap between protected species and the fisheries is not expected. Specifically, as provided in section 6.1.2, although “more gear is removed from the closure areas, the relatively small amount of gear affected and the potential for displacement means that overall effort changes are slight. The change in location also generally should have slight effects (with the exception noted that for the Southern New England area as it relates to North Atlantic right whales, described below).” In addition, as provided in section 6.1.2, as it relates to gear modifications (e.g., low profile gillnet), negligible effort shifts in intensity or distribution are expected in either fishery. Industry feedback on this and the other proposed alternatives indicated that fishery participants would likely continue operating within the bycatch hotspot polygons in compliance with the proposed measures. To avoid gear restrictions, fishery participants may remove their gear or some may displace effort to the boundaries of the polygons; however, these are expected to be outliers and overall effort should remain approximately similar, at least in terms of the effects of the proposed measures. The occurrence and distribution of Atlantic sturgeon overlaps with the fishing footprint of the monkfish and spiny dogfish fishing footprints in SNE and the Mid-Atlantic, including those areas identified as a sturgeon bycatch hotspot polygon under Alternative 4. The results of the sturgeon bycatch reduction analysis indicate that Alternative 4 would reduce sturgeon bycatch by 4.1% or 1.9% coastwide based on gillnet gear shifting up to 20 miles or 50 miles, respectively, from where it is currently fished within each of the sturgeon bycatch hotspot polygons. The percent reductions could be greater if, as suggested by the literature, Atlantic sturgeon are less numerous in Mid-Atlantic waters beyond the 20m depth contour. A reduction of sturgeon bycatch should also result in a reduction in sturgeon bycatch mortality given that fewer fish would interact with gillnet gear and, therefore, be at risk of dying in the gear. However, this could be offset if shifts in effort

result in longer soak times. If that were to occur, then bycatch mortality would remain the same or increase, overall, given the increased likelihood of sturgeon mortality with increasing soak time. The requirement to use low profile gillnet gear in the NJ sturgeon bycatch hotspot polygon beginning January 1, 2026, for the month of December is expected to reduce the number of sturgeon that are incidentally caught while retaining enough of the targeted catch. However, the extent of sturgeon bycatch reduction is highly uncertain given the limited period in which low-profile gear would be required and whether it would be set in areas within the polygon that overlapped with Atlantic sturgeon distribution.

The overnight soak prohibition from May 1- May 31 and from December 1-December 31 for vessels with a federal fishing permit targeting spiny dogfish in the NJ sturgeon bycatch hotspot polygon is expected to reduce the amount of sturgeon bycatch although the extent of the reduction is uncertain. More importantly, the overnight soak prohibition would effectively eliminate the likelihood of sturgeon mortality in the gear in all but exceptional circumstances. The majority of observed Atlantic sturgeon that are captured in gillnet gear targeting spiny dogfish are alive when the gear is hauled (Figure 39, Table 48). Nevertheless, any mortality negatively impacts endangered Atlantic sturgeon. To inform this impacts analysis we, therefore, focused on the number of sturgeon found alive in gear that was soaked for < 24 hours. Data collected for gear that was soaked for more than 24 hours is less informative because there is no way of knowing when the sturgeon was captured in the gear. Based on preliminary analysis of observer data (2015-2022 with dogfish as target 1 and target 2 species), no Atlantic sturgeon have died when captured in gillnet gear targeting spiny dogfish that was soaked for less than 16 hours. Therefore, the overnight soak prohibition would reduce mortality of Atlantic sturgeon compared to current operation of the fishery. Taking into consideration this, and the fact that under Alternative 4, significant changes to either fisheries existing footprint are not expected, impacts to Atlantic sturgeon are not expected to be any greater than current conditions. Given the expected, albeit slight, reduction in gillnet gear, as well as the use of low-profile gear and implantation of an overnight soak prohibition in the spiny dogfish fishery, Alternative 4 may afford some benefits to Atlantic sturgeon by reducing the risk of entanglement, and any associated mortality. Based on this and the information above, although some reduction in entanglement and mortality risk to Atlantic sturgeon is expected under this Alternative, as interactions can still occur, Alternative 4 is expected to result in slight negative impacts to ESA-listed species of Atlantic sturgeon.

Each of the sturgeon bycatch hotspot polygons under Alternative 4 overlap in total or in part with management areas defined under the HPTRP that are also closed to large mesh (7-18-inch) and/or small mesh (>5-<7-inch) gillnet gear at certain times of the year. The closure time periods of this action do not overlap with the HPTRP closures. Therefore, for part of the SNE polygon, gillnet gear fished for the monkfish fishery would be prohibited from March 1-March 31 under the HPTRP, and from December 1-December 31 under this alternative. Similarly, for the NJ sturgeon bycatch polygon, gillnet gear fished in the monkfish fishery would be prohibited from that part of the polygon that overlaps with the HPTRP Northern Mudhole Management Area from February 1-March 15 and April 1-April 20 under the HPTRP and from November 1-November 30 and, if not using low-profile gillnet gear, also December 1-December 31 under this alternative. Gillnet gear fished in the spiny dogfish fishery would be prohibited from that part of the NJ polygon that overlaps with the Northern Mudhole Management Area from January 1-February 14 under the HPTRP requirements, and from November 1-November 30 under this alternative. The effects of the HPTRP requirements are already reflected in the current operation of the fishery. It is possible that the addition of the closures under this alternative to the HPTRP measures already in place could further change fishing behavior (e.g., choosing not to fish in a sturgeon bycatch hotspot polygon even when gillnet gear is not prohibited) that would change the impacts of this action for Atlantic sturgeon. However, we do not have information to inform whether fishing behavior might change.

As described in Alternative 2, section 6.4.2, the distribution and occurrence of protected (ESA-listed and/or MMPA protected) species of sea turtles, large whales, small cetaceans, pinnipeds, and giant manta rays overlaps with the fishing footprint of the monkfish and spiny dogfish fisheries operating in SNE and

the Mid-Atlantic, including those areas identified as a sturgeon bycatch hotspot polygon under Alternative 4. As fishing behavior and effort, as well as the seasonal time/area closures and gear modifications specified under Alternative 4 are similar to those provided under Alternative 2, the impacts of Alternative 4 on protected species of sea turtles, large whales, small cetaceans, pinnipeds, and giant manta rays are expected to be similar to those provided under Alternative 2. As a result, Alternative 4 is expected to result in slight negative impacts to ESA-listed species sea turtles, and giant manta rays. For protected species (ESA-listed and MMPA protected) of large whales, impacts are expected to range slight moderate negative to slight positive, with slight negative to slight moderate negative impacts expected for ESA listed species of large whales, and slight negative to slight positive impacts for MMPA protected species (non-ESA listed) of large whales. For MMPA protected species (non-ESA listed) of small cetaceans and pinnipeds, impacts are expected to be slight negative for small cetaceans in poor conditions (i.e., Northern and Southern Migratory Coastal Stocks of Bottlenose Dolphins; section 5.3), and slight positive impacts to small cetaceans and pinnipeds in good condition. For additional information and rationale supporting these determinations, refer to Alternative 2, section 6.4.2.

Relative to Alternative 1, Alternative 4 is expected to have negligible to slight moderate positive impacts to ESA-listed species of Atlantic sturgeon, and negligible to slight positive impacts to ESA-listed species of sea turtles and giant manta rays. In regards to large whales, relative to Alternative 1, Alternative 4 is expected to result in slight positive to slight moderate negative impacts to these species, with negligible to slight positive impacts expected for all protected species of large whales, except for ESA-listed species of North Atlantic right whales; for North Atlantic right whales, depending on potential effort shifts in SNE, impacts to this listed species could range from slight positive to slight moderate negative. For MMPA protected species (non-ESA listed) of small cetaceans and pinnipeds, relative to Alternative 1, Alternative 4 is expected to have negligible to slight moderate positive impacts to these species.

Alternatives 2, 3, and 4 designate the same closure areas, with varying durations in which the areas are seasonally closed. These alternatives also implement gear modifications and/or overnight soak prohibitions in the spiny dogfish fishery. Given these similarities, and similarities in expected changes in fishing behavior and effort under each Alternative, relative to Alternatives 2 and 3, the impacts of Alternative 4 on protected species (ESA-listed or MMPA protected) of sea turtles, large whales, small cetaceans and pinnipeds, and giant manta rays, are expected to be negligible.

In regards to Atlantic sturgeon, weighing the differences in impacts between Alternatives 2 through 4 are difficult given similarities in the measures specified under each. As a result, to better elucidate the potential differences in impacts between alternatives, we evaluated each Alternative's potential to reduce bycatch mortality. In the monkfish fishery, Alternatives 2 through 4 implement seasonal closures in SNE that will aid in reducing bycatch mortality, with Alternative 2 implementing the longest seasonal closure windows in SNE relative to Alternatives 3 or 4. Under Alternative 2, the closures of the NJ polygon (monkfish and spiny dogfish fishery) and the DE/MD/VA (spiny dogfish fishery) polygons to gillnet gear fished would eliminate the likelihood of Atlantic sturgeon bycatch mortality in these areas for the respective time periods. However, in addition to these seasonal closures, in NJ and DE/MD/VA, the seasonal prohibition on overnight soaks in NJ (spiny dogfish fishery) under Alternatives 3 and 4 would likewise eliminate the likelihood of sturgeon bycatch mortality even though interactions would still occur. Given the above, and considering the seasonal duration of each closure and/or overnight soak prohibition under each Alternative, Alternative 4 affords the least sturgeon bycatch mortality reduction. For instance, just considering the measures in the spiny dogfish fishery indicates that Alternative 4 would afford approximately 20 weeks of sturgeon bycatch mortality reduction in the spiny dogfish which is less than what would occur under Alternatives 2 (i.e., 35 weeks), and 3 (i.e., approximately 24 weeks). Based on this, relative to Alternatives 2 and 3, Alternative 4 is expected to result in negligible to slight moderate negative impacts to Atlantic sturgeon.

Relative to Alternative 5, which will not incorporate any seasonal closures, but will implement some gear modifications, Alternative 4 is expected to result in negligible to slight positive impacts on protected species (ESA-listed or MMPA protected) of sea turtles, large whales (except North Atlantic right whales) small cetaceans, pinnipeds, and giant manta rays. However, with no seasonal closures specified under Alternative 5, potential shifts in effort into regions of SNE where North Atlantic right whales are known to aggregate are not expected under this Alternative. As a result, relative to Alternative 5, Alternative 4 is expected to result negligible to slight moderate negative impacts to North Atlantic rights. For Atlantic sturgeon, to better elucidate the potential differences in impacts between alternatives 4 and 5, we evaluated each Alternative's potential to reduce bycatch mortality. In the monkfish fishery, Alternatives 3 implements seasonal closures in SNE (monkfish fishery), NJ (monkfish and spiny dogfish fishery) and the DE/MD/VA (spiny dogfish fishery) polygons to gillnet gear fished; these measures would eliminate the likelihood of Atlantic sturgeon bycatch mortality in these areas for the respective time periods. Although Alternative 5 does not implement seasonal closures, it does specify the prohibition of overnight soaks in the spiny dogfish fishery in the NJ and DE/MD/VA polygons over specified periods of time; this would reduce the likelihood of sturgeon bycatch mortality even though interactions would still occur. Therefore, when looking at the combined effect of closures and/or the prohibition on overnight soaks, Alternative 4 would afford slightly less sturgeon bycatch mortality reduction compared to Alternative 5. For instance, just considering the measures in the spiny dogfish fishery indicates that Alternative 4 would afford approximately 20 weeks of sturgeon bycatch mortality reduction in the spiny dogfish fishery which is less than what would occur under Alternatives 5 (i.e., approximately 28 weeks of sturgeon bycatch mortality reduction). As a result, relative to Alternatives 5, Alternative 4 is expected to result in negligible to slight negative impacts to ESA-listed species of Atlantic sturgeon.

6.4.5 Alternative 5 – Gear-Only Sturgeon Package (Preferred Alternative)

Under Alternative 5, only gear restrictions would be required in several Atlantic sturgeon bycatch hotspot areas. Gear restrictions will include year round use of low-profile gillnet gear in the monkfish fishery in the New Jersey sturgeon bycatch hotspot polygon (to be implemented on January 1, 2026), and seasonal overnight soak time prohibition from 8pm until 5am for the spiny dogfish fishery in the NJ and DE/MD/VA sturgeon bycatch hotspot polygons. Alternative 5 also proposed two optional sub-alternatives (5a and 5b; 5b preferred) for vessels using < 5.25" gillnet mesh that would be exempt from the overnight soak prohibition in the NJ and DE/MD/VA sturgeon bycatch hotspot polygons.

As provided in section 6.1.2 and section 6.2.5, Alternative 5 and its sub-alternatives are not expected to result in significant changes in fishing effort or behavior in the monkfish or spiny dogfish fisheries relative to current operating conditions in these fisheries. Specifically, as stated in the section 6.1.2, "in terms of the gear restriction measures included in Alternative 5, negligible effort shifts in intensity or distribution in neither the monkfish nor dogfish fisheries are expected. Industry feedback during Council development of these alternatives indicated that fishery participants would be likely to continue operating within the bycatch hotspot polygons in compliance with the proposed measures. For both fisheries, there may be some displacement of effort to the boundaries of the polygons as vessels avoid the gear restrictions, and some participants may eliminate their gear/effort as a result of these measures (if the additional requirements are too burdensome), but these are expected to be outliers and overall effort should remain approximately similar, at least in terms of the effects of the proposed measures." Based on this, Alternative 5 is not expected to result in changes to the current fishing footprint of the monkfish and spiny

dogfish fisheries, and therefore, significant changes in overlap between protected species and the fisheries is not expected under this Alternative.

The occurrence and distribution of Atlantic sturgeon overlaps with the fishing footprint of the monkfish and spiny dogfish fishing footprints in SNE and the Mid-Atlantic, including those areas identified as a sturgeon bycatch hotspot polygon under Alternative 5. The use of low-profile gillnet gear year-round in the NJ sturgeon bycatch hotspot polygon beginning January 1, 2026, is expected to reduce the number of sturgeon incidentally captured in the gear. A reduction in sturgeon caught should also result in a reduction in sturgeon bycatch mortality. The prohibition on overnight soaks for vessels with a federal fishing permit targeting spiny dogfish in the NJ sturgeon bycatch hotspot polygon in the months of May and November, and a prohibition on overnight soaks in the DE/MD/VA bycatch hotspot polygons from November through March is similarly likely to benefit Atlantic sturgeon by reducing the amount of time that the gear could interact with sturgeon although the extent of the reduction is uncertain. Perhaps more importantly, the overnight soak prohibition would effectively eliminate the likelihood of sturgeon mortality in the gear in all but exceptional circumstances. The overnight soak prohibition from May 1- May 31, November 1- November 30, and from December 1-December 31 for vessels with a federal fishing permit targeting spiny dogfish in the NJ sturgeon bycatch hotspot polygon as well as the overnight soak prohibition in the DE/MD/VA polygons from November 1-March 31 is expected to reduce the amount of sturgeon bycatch although the extent of the reduction is uncertain. More importantly, the overnight soak prohibition would effectively eliminate the likelihood of sturgeon mortality in the gear in all but exceptional circumstances. The majority of observed Atlantic sturgeon that are captured in gillnet gear targeting spiny dogfish are alive when the gear is hauled (Figure 39, Table 48, Figure 39). Nevertheless, any mortality negatively impacts endangered Atlantic sturgeon. To inform this impacts analysis we, therefore, focused on the number of sturgeon found alive in gear that was soaked for < 24 hours. Data collected for gear that was soaked for more than 24 hours is less informative because there is no way of knowing when the sturgeon was captured in the gear. Based on preliminary analysis of observer data (2015-2022 with dogfish as target 1 and target 2 species), no Atlantic sturgeon have died when captured in gillnet gear targeting spiny dogfish that was soaked for less than 16 hours. Therefore, the overnight soak prohibition would reduce mortality of Atlantic sturgeon compared to current operation of the fishery. Taking into consideration this, and the fact that under Alternative 5, significant changes to either fisheries existing footprint are not expected, impacts to Atlantic sturgeon are not expected to be any greater than current conditions. Given the required year round use of low-profile gillnet gear in the monkfish fishery in the NJ sturgeon bycatch hotspot polygon, and overnight soak prohibitions in the spiny dogfish fishery in the NJ and DE/MD/VA sturgeon bycatch hotspot polygons, Alternative 5 may afford some benefits to Atlantic sturgeon by reducing the risk of entanglement, and any associated mortality. Based on this and the information above, although mortality risks to Atlantic sturgeon is expected under this Alternative, as interactions can still occur, Alternative 5 is expected to result in slight negative impacts to ESA-listed species of Atlantic sturgeon.

As described in section 5.3, the distribution and occurrence of protected (ESA-listed and/or MMPA protected) species of sea turtles, large whales, small cetaceans, pinnipeds, and giant manta rays overlaps with the fishing footprint of the monkfish and spiny dogfish fisheries operating in SNE and the Mid-Atlantic, including those areas identified as a sturgeon bycatch hotspot polygon under Alternative 5. As fishing behavior and effort under Alternative 5 is not expected to be significantly different from current operating conditions in either fishery, the impacts of Alternative 5 on protected species of sea turtles, large whales, small cetaceans, pinnipeds, and giant manta rays are expected to be similar to those provided under Alternative 1, with some potential benefit (i.e., reduction in entanglement risk) afforded to these protected species from the overnight soak prohibitions specified in Alternative 5. As a result, Alternative 5 is expected to result in slight negative impacts to ESA-listed species (i.e., sea turtles, large whales, Atlantic sturgeon, and giant manta rays), and slight negative to slight positive impacts to MMPA protected species (non-ESA) of marine mammals (i.e., small cetaceans, pinnipeds, and large whales). For additional information and rationale supporting these determinations, refer to Alternative 1, section 6.4.1.

Given the above information, relative to Alternative 1, Alternative 5 is expected to result in negligible to slight positive impacts to ESA-listed species of sea turtles, large whales, and giant manta rays, and negligible to slight moderate positive impacts to Atlantic sturgeon.

Alternatives 2, 3, and 4 designate the same closure areas, with varying durations in which the areas are seasonally closed. These alternatives also implement gear restrictions (e.g., low profile gillnets and/or overnight soak prohibitions) in the spiny dogfish fishery. Seasonal closures and/or gear restrictions may afford some benefits to protected species by reducing the likelihood of an interaction with the gillnet gear. Although Alternative 5 does include similar gear restrictions in the monkfish (i.e., year round low profile gillnets) and spiny dogfish fisheries (e.g., overnight soak prohibitions), alternative 5 does not include seasonal closure areas. As a result, relative to Alternatives 2, 3, and 4, the impacts of Alternative 5 on protected species (ESA-listed or MMPA protected) of sea turtles, large whales, small cetaceans and pinnipeds, and giant manta rays, are expected to be negligible to slight negative.

For Atlantic sturgeon, weighing the differences in impacts between Alternatives 2 through 5 can be difficult. Relative to Alternatives 2 through 4, Alternative 5 does not specify any seasonal closure areas in any of the sturgeon bycatch hotspot polygons identified in SNE, NJ, or DE/MD/VA; and therefore, relative to these other alternative, Alternative 5 is lacking some degree of sturgeon bycatch reduction afforded by these other alternatives. Commonalities between Alternatives 2 through 5 are associated with the overnight soak prohibitions in the spiny dogfish fishery; however the benefits afforded to sturgeon from this gear restriction varies between Alternative based the area and timeframe the prohibition is in place. The prohibition on overnight soaks in the spiny dogfish fishery within the NJ polygon and the DE/MD/VA polygons under Alternative 5 would eliminate sturgeon bycatch mortality even though interactions would still occur. Therefore, when looking at the spiny dogfish fishery and the combined effect of closures and the prohibition on overnight soaks, Alternative 5 would afford an additional 4 weeks of sturgeon bycatch mortality reduction compared to Alternative 3, and an additional 8 weeks compared to Alternative 4. Alternative 5 would afford 6 fewer weeks of sturgeon bycatch mortality reduction compared to Alternative 2 for the spiny dogfish fishery. The requirement to use low-profile gillnet gear in the NJ sturgeon bycatch hotspot polygon year-round is expected to reduce sturgeon bycatch and has the potential to reduce sturgeon bycatch to a greater extent than what would be achieved with the NJ polygon closures under Alternatives 2, 3, and 4. However, the low-profile gillnet gear with a 0.81 mm twine size is still experimental and will also require a change to the HPTRP regulations for it to be used with large-mesh gillnet gear (i.e., >7-inch mesh). Therefore, given the uncertainty, Alternative 5 is as negative or more negative for Atlantic sturgeon compared to Alternatives 2, 3, and 4.

6.5 IMPACTS ON PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

6.5.1 Alternative 1 – No Action

Under Alternative 1 (No Action), the current federal measures for the monkfish and spiny dogfish gillnet fisheries would remain – new measures to reduce sturgeon bycatch would not be implemented in 2024 through Council action.

The impacts of Alternative 1 on the physical environment and EFH would likely be negligible to slight negative because monkfish and spiny dogfish fishing activity would continue using both gillnet and other gear types, which would not actively improve habitat. Alternative 1 is negligible relative to Alternatives 2, 3, 4, and 5. Because this action is focused only on the monkfish and spiny dogfish gillnet fisheries (e.g., not trawl or other gear types), changes in gillnet effort will not affect the magnitude of habitat impacts associated with these two gillnet fisheries given gillnet gear has minimal and temporary effects

on seafloor habitats and EFH. Regardless of changes to the gillnet fishery other gear types will continue to be used in these fisheries and would have similar ongoing impacts as in the past. The focus of this action is on changes to the gillnet fishery, which comprises the majority of effort in both fisheries. In addition, gear modifications (low-profile gillnet gear and overnight soak prohibition) are not likely to change impacts to habitat and EFH. As a result, there are not likely to be differences between the alternatives under consideration.

6.5.2 Alternative 2 – Most restrictive Sturgeon Package (Most Time/Area Closures and Gear Restrictions)

Under Alternative 2, there would be a broad array of time/area closures and gear restrictions for both the federal monkfish and spiny dogfish gillnet fisheries in the Atlantic sturgeon bycatch hotspot areas. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon.

The impacts of Alternative 2 on the physical environment and EFH would likely be negligible to slight negative because monkfish and spiny dogfish fishing activity would continue using both gillnet and other gear types, which would not actively improve habitat. Alternative 2 is negligible relative to Alternatives 1, 3, 4, and 5. Because this action is focused only on the monkfish and spiny dogfish gillnet fisheries (e.g., not trawl or other gear types), changes in gillnet effort will not affect the magnitude of habitat impacts associated with these two gillnet fisheries given gillnet gear has minimal and temporary effects on seafloor habitats and EFH. Expected changes in fishing effort are further explained in Section 6.2.2. Regardless of changes to the gillnet fishery, other gear types will continue to be used in these fisheries and would have similar ongoing impacts as in the past. The focus of this action is on changes to the gillnet fishery which comprises the majority of effort in both fisheries. In addition, gear modifications (low-profile gillnet gear) are not likely to change impacts to habitat and EFH. As a result, there are not likely to be differences between the alternatives under consideration.

6.5.3 Alternative 3 – Intermediate Sturgeon Package

Under Alternative 3, a subset of the time/area closures and gear restrictions under consideration in Alternative 2 for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas. This alternative is the intermediate alternative under consideration in terms of closures. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot area.

The impacts of Alternative 3 on the physical environment and EFH would likely be negligible to slight negative because monkfish and spiny dogfish fishing activity would continue using both gillnet and other gear types, which would not actively improve habitat. Alternative 3 is negligible relative to Alternatives 1, 2, 4, and 5. Because this action is focused only on the monkfish and spiny dogfish gillnet fisheries (e.g., not trawl or other gear types), changes in gillnet effort will not affect the magnitude of habitat impacts associated with these two gillnet fisheries given gillnet gear has minimal and temporary effects on seafloor habitats and EFH. Expected changes in fishing effort are further explained in Section 6.2.2. Regardless of changes to the gillnet fishery other gear types will continue to be used in these fisheries and

would have similar ongoing impacts as in the past. The focus of this action is on changes to the gillnet fishery which comprises the majority of effort in both fisheries. In addition, gear modifications (low-profile gillnet gear and overnight soak prohibition) are not likely to change impacts to habitat and EFH. As a result, there are not likely to be differences between the alternatives under consideration.

6.5.4 Alternative 4 – Less restrictive Sturgeon Package (Least Time/Area Closures and Gear Restrictions)

Under Alternative 4, only the most targeted time/area closures and gear restrictions under consideration for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas (Figure 5, Figure 6, Figure 7). This alternative has the fewest measures, based on times where observed sturgeon bycatch is the highest. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot polygon.

The impacts of Alternative 4 on the physical environment and EFH would likely be negligible to slight negative because monkfish and spiny dogfish fishing activity would continue using both gillnet and other gear types, which would not actively improve habitat. Alternative 4 is negligible relative to Alternatives 1, 2, 3, and 5. Because this action is focused only on the monkfish and spiny dogfish gillnet fisheries (e.g., not trawl or other gear types), changes in gillnet effort will not affect the magnitude of habitat impacts associated with these two gillnet fisheries given gillnet gear has minimal and temporary effects on seafloor habitats and EFH. Expected changes in fishing effort are further explained in Section 6.2.2. Regardless of changes to the gillnet fishery other gear types will continue to be used in these fisheries and would have similar ongoing impacts as in the past. The focus of this action is on changes to the gillnet fishery which comprises the majority of effort in both fisheries. In addition, gear modifications (low-profile gillnet gear and overnight soak prohibition) are not likely to change impacts to habitat and EFH. As a result, there are not likely to be differences between the alternatives under consideration.

6.5.5 Alternative 5 – Gear-Only Sturgeon Package (Preferred Alternative)

Under Alternative 5, there would be gear restrictions for both the federal monkfish and spiny dogfish fisheries in several Atlantic sturgeon bycatch hotspot areas. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and an overnight soak time prohibition for vessels with federal spiny dogfish permits using gillnet gear in the New Jersey bycatch hotspot polygon and in the Delaware/Maryland/Virginia bycatch hotspot area.

The impacts of Alternative 5 including Sub-alternatives 5A and 5B on the physical environment and EFH would likely be negligible to slight negative because monkfish and spiny dogfish fishing activity would continue using both gillnet and other gear types, which would not actively improve habitat. Alternative 5 is negligible relative to Alternatives 1, 2, 3, and 4. Because this action is focused only on the monkfish and spiny dogfish gillnet fisheries (e.g., not trawl or other gear types), changes in gillnet effort will not affect the magnitude of habitat impacts associated with these two gillnet fisheries given gillnet gear has minimal and temporary effects on seafloor habitats and EFH. Expected changes in fishing effort are further explained in Section 6.2.2. Regardless of changes to the gillnet fishery other gear types will continue to be used in these fisheries and would have similar ongoing impacts as in the past. The focus of

this action is on changes to the gillnet fishery which comprises the majority of effort in both fisheries. In addition, gear modifications (low-profile gillnet gear and overnight soak prohibition) are not likely to change impacts to habitat and EFH. As a result, there are not likely to be differences between the alternatives under consideration, including the sub-alternatives which would exempt a subset of the dogfish fishery using < 5.25" mesh from overnight soak prohibitions.

6.6 IMPACTS ON HUMAN COMMUNITIES

6.6.0 Introduction and Baseline Conditions

Directed recreational fishing for spiny dogfish or monkfish is very low, and no measures in this action would affect recreational fishing, so the focus in this section is on commercial fishing impacts. Where possible, effects on ex-vessel revenues are described. Although ex-vessel revenues are a useful indicator of relative importance for various fisheries and impacts from management measures, it is worth noting that the full socio-economic importance of fisheries comes from the overall economic activity, jobs, and personal/community vitality that are supported by the fisheries and their ex-vessel revenues. In fact, when related impact multipliers are considered, the actual economic impact is generally several times larger than mere ex-vessel revenues. The social impacts of regulations relate to changes such as demographics, employment, fishery dependence, safety, attitudes, equity, cultural values, and the well-being of persons, families, and fishing communities (Burdge 1998; NMFS 2007). While difficult to measure, positive social impacts are expected to accompany measures that increase ex-vessel revenues and negative social impacts to accompany measures that decrease ex-vessel revenues. The above concepts apply to each alternative and are not repeated hereafter. The discussion below focuses on changes in catch, but for any of the alternatives that involve low-profile gear (all action alternatives for the NJ polygon) or mesh requirements (VA exemptions in Alternative 5), there is also a cost of acquiring that gear and that is not repeated for each relevant alternative. The smaller twine may also lead to faster gear repair/replacement cycles. Gear restrictions for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon would be implemented on January 1, 2026 to allow provisioning of gear and hopefully allow fishermen to plan the requirements into their gear replacement cycle to minimize costs. NMFS typically includes some implementation period for new gears generally, which should also mitigate costs for the smaller mesh for the VA exemptions. However, it is expected that since gear must be regularly replaced, the effects from the gear changes would be a relatively small component of the socioeconomic impacts compared to the closure areas. The impact of the gear changes is also difficult to predict because it will vary by participant depending on where they are in their typical gear replacement cycle. Therefore the analysis below focuses on the relative closures and their degree of impacts (or a lack of closure for Alternatives 1 and 5).

Spiny Dogfish Fishery Baseline Condition for Socioeconomic Impacts:

The socioeconomic contributions of spiny dogfish have been slightly positive in recent years. The justification for this conclusion includes: Due to the year-to-year variation in catch and effort in the fishery, it is difficult to fully quantify human community impacts but the current fishery supports a number of vessels (though declining in the last decade), as described in Section 5.5, and provides a variety of jobs related directly to fishing and also in associated support services. 79-87 federally-permitted vessels landed over 10,000 pounds of spiny dogfish (measured in live pounds) in the 2020-2022 fishing years, with total spiny dogfish landings ex-vessel revenues averaging \$2.5 million (range \$2.3-\$2.7 million). These ex-vessel amounts are smaller than many other Council-managed species, leading to the “slight” qualifier for positive noted above (also considering the declining participation). For an individual vessel or dealer/processor however, spiny dogfish may be a crucial part of their annual operations. Appendix D describes average 2020-2022 monthly spiny dogfish landings and revenues generally and specific to the areas potentially affected by the sturgeon management measures, which will help contextualize the impacts of the alternatives.

Monkfish Fishery Baseline Condition for Socioeconomic Impacts:

The socioeconomic contributions of monkfish have been moderately positive in recent years. The justification for this conclusion includes: Due to the year-to-year variation in catch and effort in the fishery, it is difficult to fully quantify human community impacts but the current fishery supports a number of vessels as described in Section 5.5, and provides a variety of jobs related directly to fishing and also in associated support services. 90-108 federally-permitted vessels landed over 10,000 pounds of monkfish (measured in landed pounds) in the 2020-2022 fishing years, with total monkfish landings ex-vessel revenues averaging \$10.7 million (range \$8.6-\$12.2 million). The “moderate” qualifier for positive is used given these revenues were substantially lower than the preceding decade. For an individual vessel or dealer/processor however, monkfish may be a crucial part of their annual operations. As described in Section 5.5, skates, groundfish, and other fish make up a substantial portion of revenues on trips using Monkfish DAS (39% in the 2021 fishing year), so the ability to target monkfish also likely facilitates these other revenues as well. If monkfish trips are disrupted, there will likely be additional revenue losses tied to the other fish that are often retained on monkfish trips. Appendix D describes average 2020-2022 monthly monkfish landings and revenues generally and specific to the areas potentially affected by the sturgeon management measures, which will help contextualize the impacts of the alternatives.

Sturgeon Baseline Condition for Socioeconomic Impacts:

The socioeconomic contributions of sturgeon have been moderate negative in recent years. The justification for this conclusion includes: In the Endangered Species Act of 1973, the U.S. Congress declared that extinct species and/or species in danger of extinction: “are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people.” These values are diminished and/or at risk for any endangered species.

6.6.1 Alternative 1 – No Action

Under Alternative 1 (No Action), the current federal measures for the monkfish and spiny dogfish gillnet fisheries would remain – new measures to reduce sturgeon bycatch would not be implemented in 2024 through Council action.

No action should maintain the socioeconomic baselines for these fisheries/resources described above – slight positive for spiny dogfish and moderately positive for monkfish as the fisheries should continue to generate ex-vessel revenues and support relevant communities. Given the impacts discussed below for the action alternatives, this would be more positive than any of the action alternatives.

Given the following discussion, socioeconomic impacts from Alternative 1 related to the sturgeon resource would likely still be moderate negative, and slightly more negative versus any of the other action alternatives given they would likely reduce bycatch and/or bycatch mortality to some degree.

Any population improvements could lead to socioeconomic benefits related to society’s value of avoiding sturgeon’s extinction. The 2007 Atlantic sturgeon assessment (several quotes from the assessment follow in this paragraph) found that “anthropogenic mortality (e.g., bycatch and ship strikes) may exceed acceptable levels, reducing recovery rates.” The assessment also noted that “Changes in carrying capacity coastwide are unknown, though it is assumed freshwater habitat has declined in quality and/or quantity,” concluding “that the primary threats to the recovery of Atlantic sturgeon stocks include bycatch mortality, ship strikes, and habitat loss and degradation.” Without a traditional assessment model and reference points (which would require “significant investment in collection of basic life history information, expansion of Atlantic sturgeon monitoring efforts, etc.”), it is not possible to quantify the population effects of Alternative 1. Given the uncertainty about take reduction, and the uncertainty of the impact of potential take reduction on sturgeon populations amid other threats, the impact differences of no action compared to any action alternatives is likely slight negative.

Overall Socioeconomic Impacts – Alternative 1

Given the slightness and uncertainty regarding sturgeon socioeconomic impacts, and that this Alternative affects monkfish and spiny dogfish landings the least, it is predicted to have moderate positive socioeconomic impacts and the most positive overall socioeconomic impacts of any alternative.

6.6.2 Alternative 2 – Most restrictive Sturgeon Package (Most Time/Area Closures and Gear Restrictions)

Under Alternative 2, there would be a broad array of time/area closures and gear restrictions for both the federal monkfish and spiny dogfish gillnet fisheries in the Atlantic sturgeon bycatch hotspot areas. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon whenever it is not closed.

Monkfish Socioeconomic Impacts – Alternative 2

Research (Fox et al. 2019) indicated no significant difference in monkfish catch rates off NJ with the proposed low-profile gear so the impacts discussed below focus on other aspects of this Alternative.

Given the following discussion, socioeconomic impacts from Alternative 2 related to the monkfish fishery/resource are likely moderate negative, and more negative than Alternatives 1, 3, 4, or 5. If monkfish trips are disrupted, there will likely be additional revenue losses tied to the other fish that are often retained on monkfish trips.

In Appendix D, the analysis identified which months would be most affected by the proposed measures for relevant areas. Months that are blank had zero or confidential (and generally low) landings. Vessels would also likely attempt to re-direct to other species and/or areas, but the net effect of such efforts is not possible to predict, and if they are maximizing their profits now, any forced changes are likely to reduce their profitability. For Alternative 2 relative to monkfish, the Southern New England area closure would be for April, May, and December. Likewise, the New Jersey closure areas would be for May, the latter half of October, November, and December. Tables 5 (SNE) and 8 (NJ) in Appendix D describe the proportions of affected monthly regional gillnet monkfish landings. May appears the most impacted and April the least impacted for the Southern New England area, while for New Jersey, December is the most impacted and several months had low/confidential landings.

While not all permits/vessels are likely to be active each month in a polygon area, the SNE monkfish polygon appears to have the potential to impact around 220 federally-permitted vessels and 45 dealers. The New Jersey monkfish polygon appears to have the potential to impact around 56 federally-permitted vessels and 15 dealers.

Spiny dogfish Socioeconomic Impacts – Alternative 2

Given the following discussion, socioeconomic impacts from Alternative 2 related to the spiny dogfish fishery/resource are likely moderate negative, and more negative than Alternatives 1, 3, 4, or 5.

In Appendix D, the analysis identified which months would be most affected by the proposed measures for relevant areas. Months that are blank had zero or confidential (and generally low) landings. Vessels would also likely attempt to re-direct to other species and/or areas, but the net effect of such efforts is not possible to predict, and if they are maximizing their profits now, any forced changes are likely to reduce their profitability. For Alternative 2 relative to spiny dogfish, New Jersey's area closure would be for

May, the second half of October starting October 15, November, and December. Likewise, the DE/MD/VA closure areas would be for November, December, January, February, and March. Tables 13 (NJ) and 16 (MD/VA) in Appendix D describe the proportions of affected monthly regional gillnet spiny dogfish landings. December appears to be the most impacted for the New Jersey area, while for DE/MD/VA, November is most impacted. For both areas, there are several months with low/confidential landings.

This alternative could impact a substantial proportion of spiny dogfish landings in these states, negatively affecting fishery participants, potentially about 25 federal permits and 9 dealers in New Jersey and about 40 federal permits and 8 dealers in MD/VA.

Sturgeon Socioeconomic Impacts – Alternative 2

Given the following discussion, socioeconomic impacts from Alternative 2 related to the sturgeon resource would likely still be moderate negative, slightly less negative versus No Action/Alternative 1, and probably negligibly different from any of the other action alternatives.

Any population improvements could lead to socioeconomic benefits related to society's value of avoiding sturgeon's extinction. The 2007 Atlantic sturgeon assessment (several quotes from the assessment follow in this paragraph) found that "anthropogenic mortality (e.g., bycatch and ship strikes) may exceed acceptable levels, reducing recovery rates." The assessment also noted that "Changes in carrying capacity coastwide are unknown, though it is assumed freshwater habitat has declined in quality and/or quantity," concluding "that the primary threats to the recovery of Atlantic sturgeon stocks include bycatch mortality, ship strikes, and habitat loss and degradation." Without a traditional assessment model and reference points (which would require "significant investment in collection of basic life history information, expansion of Atlantic sturgeon monitoring efforts, etc."), it is not possible to quantify the population effects of Alternative 2. Given the uncertainty about take reduction, and the uncertainty of the impact of potential take reduction on sturgeon populations amid other threats, the impact difference compared to no action is slight and differences among any action alternatives are likely negligible.

Overall Socioeconomic Impacts – Alternative 2

Given the slightness and uncertainty regarding sturgeon socioeconomic impacts, and that this Alternative affects monkfish and spiny dogfish landings the most, it is predicted to have moderate negative socioeconomic impacts and the most negative overall socioeconomic impacts of any alternative.

6.6.3 Alternative 3 – Intermediate Sturgeon Package

Under Alternative 3, a subset of the time/area closures and gear restrictions under consideration in Alternative 2 for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas. This alternative is the intermediate alternative under consideration in terms of closures. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon when it is not closed and overnight soak time prohibitions for the spiny dogfish fishery in the New Jersey bycatch hotspot polygon.

Monkfish Socioeconomic Impacts – Alternative 3

Research (Fox et al. 2019) indicated no significant difference in monkfish catch rates off NJ with the proposed low-profile gear so the impacts discussed below focus on other aspects of this Alternative.

Given the following discussion, socioeconomic impacts from Alternative 3 related to the monkfish fishery/resource are likely moderate negative, and more negative than Alternatives 1, 4, or 5 and less negative than Alternative 2. If monkfish trips are disrupted, there will likely be additional revenue losses tied to the other fish that are often retained on monkfish trips.

In Appendix D, the analysis identified which months would be most affected by the proposed measures for relevant areas. Months that are blank had zero or confidential (and generally low) landings. Vessels would also likely attempt to re-direct to other species and/or areas, but the net effect of such efforts is not possible to predict, and if they are maximizing their profits now, any forced changes are likely to reduce their profitability. For Alternative 3 relative to monkfish, the Southern New England area closure would be for May and December. Likewise, the New Jersey closure areas would be for December. Tables 5 (SNE) and 8 (NJ) in Appendix D describe the proportions of affected monthly regional gillnet monkfish landings. May appears the most impacted and April the least impacted for the Southern New England area, while for New Jersey, December is the most impacted and several months had low/confidential landings.

While not all permits/vessels are likely to be active each month in a polygon area, the SNE monkfish polygon appears to have the potential to impact around 220 federally-permitted vessels and 45 dealers. The New Jersey monkfish polygon appears to have the potential to impact around 56 federally-permitted vessels and 15 dealers.

Spiny dogfish Socioeconomic Impacts – Alternative 3

Given the following discussion, socioeconomic impacts from Alternative 3 related to the spiny dogfish fishery/resource are likely moderate negative, and more negative than Alternatives 1, 4, or 5 but less negative than Alternative 2.

In Appendix D, the analysis identified which months would be most affected by the proposed measures for relevant areas. Months that are blank had zero or confidential (and generally low) landings. Vessels would also likely attempt to re-direct to other species and/or areas, but the net effect of such efforts is not possible to predict, and if they are maximizing their profits now, any forced changes are likely to reduce their profitability. For Alternative 3 relative to spiny dogfish, New Jersey's area closure would be for November, and December. Likewise, the DE/MD/VA closure areas would be for December, January, and February. Tables 13 (NJ) and 16 (MD/VA) in Appendix D describe the proportions of affected monthly regional gillnet spiny dogfish landings. December appears to be the most impacted for the New Jersey area, while for DE/MD/VA, November is most impacted. For both areas, there are several months with low/confidential landings.

This alternative could impact a substantial proportion of spiny dogfish landings in these states, negatively affecting fishery participants, potentially about 25 federal permits and 9 dealers in New Jersey and about 40 federal permits and 8 dealers in MD/VA.

The Councils received public input that the overnight soak prohibitions in Alternative 3 (effective in May) for spiny dogfish may be feasible for New Jersey given some fishery participants already mostly fish without overnight soaks.

Sturgeon Socioeconomic Impacts – Alternative 3

Given the following discussion, socioeconomic impacts from Alternative 3 related to the sturgeon resource would likely still be moderate negative, slightly less negative versus No Action/Alternative 1, and probably negligibly different from any of the other action alternatives.

Any population improvements could lead to socioeconomic benefits related to society's value of avoiding sturgeon's extinction. The 2007 Atlantic sturgeon assessment (several quotes from the assessment follow in this paragraph) found that "anthropogenic mortality (e.g., bycatch and ship strikes) may exceed

acceptable levels, reducing recovery rates.” The assessment also noted that “Changes in carrying capacity coastwide are unknown, though it is assumed freshwater habitat has declined in quality and/or quantity,” concluding “that the primary threats to the recovery of Atlantic sturgeon stocks include bycatch mortality, ship strikes, and habitat loss and degradation.” Without a traditional assessment model and reference points (which would require “significant investment in collection of basic life history information, expansion of Atlantic sturgeon monitoring efforts, etc.”), it is not possible to quantify the population effects of Alternative 3. Given the uncertainty about take reduction, and the uncertainty of the impact of potential take reduction on sturgeon populations amid other threats, the impact difference compared to no action is slight and differences among any action alternatives are likely negligible.

Overall Socioeconomic Impacts – Alternative 3

Given the slightness and uncertainty regarding sturgeon socioeconomic impacts, and that this Alternative affects monkfish and spiny dogfish landings in an intermediate fashion, it is predicted to have moderate negative socioeconomic impacts. Impacts would be more negative compared to all alternatives except Alternative 2.

6.6.4 Alternative 4 – Less restrictive Sturgeon Package (Least Time/Area Closures and Gear Restrictions)

Under Alternative 4, only the most targeted time/area closures and gear restrictions under consideration for both the federal monkfish and spiny dogfish fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas (Figure 5, Figure 6, Figure 7). This alternative has the fewest measures, based on times where observed sturgeon bycatch is the highest. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and vessels with federal spiny dogfish permits using gillnet gear. Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and overnight soak time prohibitions for the spiny dogfish fishery in the New Jersey bycatch hotspot polygon.

Monkfish Socioeconomic Impacts – Alternative 4

Research (Fox et al. 2019) indicated no significant difference in monkfish catch rates off NJ with the proposed low-profile gear so the impacts discussed below focus on other aspects of this Alternative.

Given the following discussion, socioeconomic impacts from Alternative 4 related to the monkfish fishery/resource are likely slight negative, and more negative than Alternatives 1 or 5 but less negative than Alternatives 2-3. If monkfish trips are disrupted, there will likely be additional revenue losses tied to the other fish that are often retained on monkfish trips.

In Appendix D, the analysis identified which months would be most affected by the proposed measures for relevant areas. Months that are blank had zero or confidential (and generally low) landings. Vessels would also likely attempt to re-direct to other species and/or areas, but the net effect of such efforts is not possible to predict, and if they are maximizing their profits now, any forced changes are likely to reduce their profitability. For Alternative 4 relative to monkfish, the Southern New England area closure would be for December. Likewise, the New Jersey closure areas would be for November. Tables 5 (SNE) and 8 (NJ) in Appendix D describe the proportions of affected monthly regional gillnet monkfish landings. May appears the most impacted and April the least impacted for the Southern New England area, while for New Jersey, December is the most impacted and several months had low/confidential landings.

While not all permits/vessels are likely to be active each month in a polygon area, the SNE monkfish polygon appears to have the potential to impact around 220 federally-permitted vessels and 45 dealers.

The New Jersey monkfish polygon appears to have the potential to impact around 56 federally-permitted vessels and 15 dealers.

Spiny dogfish Socioeconomic Impacts – Alternative 4

Given the following discussion, socioeconomic impacts from Alternative 4 related to the spiny dogfish fishery/resource are likely moderate negative, and more negative than Alternatives 1 or 5 but less negative than Alternatives 2-3.

In Appendix D, the analysis identified which months would be most affected by the proposed measures for relevant areas. Months that are blank had zero or confidential (and generally low) landings. Vessels would also likely attempt to re-direct to other species and/or areas, but the net effect of such efforts is not possible to predict, and if they are maximizing their profits now, any forced changes are likely to reduce their profitability. For Alternative 4 relative to spiny dogfish, New Jersey's area closure would be for November. Likewise, the DE/MD/VA closure areas would be for December and January. Tables 13 (NJ) and 16 (MD/VA) in Appendix D describe the proportions of affected monthly regional gillnet spiny dogfish landings. December appears to be the most impacted for the New Jersey area, while for DE/MD/VA, November is most impacted. For both areas, there are several months with low/confidential landings.

This alternative could impact a substantial proportion of spiny dogfish landings in these states, negatively affecting fishery participants, potentially about 25 federal permits and 9 dealers in New Jersey and about 40 federal permits and 8 dealers in MD/VA.

The Councils received public input that the overnight soak prohibitions in Alternative 4 (effective in December and May) for spiny dogfish may be feasible for New Jersey given some fishery participants already mostly fish without overnight soaks.

Sturgeon Socioeconomic Impacts – Alternative 4

Given the following discussion, socioeconomic impacts from Alternative 4 related to the sturgeon resource would likely still be moderate negative, slightly less negative versus No Action/Alternative 1, and probably negligibly different from any of the other action alternatives.

Any population improvements could lead to socioeconomic benefits related to society's value of avoiding sturgeon's extinction. The 2007 Atlantic sturgeon assessment (several quotes from the assessment follow in this paragraph) found that "anthropogenic mortality (e.g., bycatch and ship strikes) may exceed acceptable levels, reducing recovery rates." The assessment also noted that "Changes in carrying capacity coastwide are unknown, though it is assumed freshwater habitat has declined in quality and/or quantity," concluding "that the primary threats to the recovery of Atlantic sturgeon stocks include bycatch mortality, ship strikes, and habitat loss and degradation." Without a traditional assessment model and reference points (which would require "significant investment in collection of basic life history information, expansion of Atlantic sturgeon monitoring efforts, etc."), it is not possible to quantify the population effects of Alternative 4. Given the uncertainty about take reduction, and the uncertainty of the impact of potential take reduction on sturgeon populations amid other threats, the impact difference compared to no action is slight and differences among any action alternatives are likely negligible.

Overall Socioeconomic Impacts – Alternative 4

Given the slightness and uncertainty regarding sturgeon socioeconomic impacts, and that this Alternative affects monkfish and spiny dogfish landings in a lower fashion, it is predicted to have moderate negative socioeconomic impacts. Impacts would be more negative compared Alternatives 1 and 5 and less negative than Alternatives 2 and 3.

6.6.5 Alternative 5 – Gear-Only Sturgeon Package (Preferred Alternative)

Under Alternative 5, there would be gear restrictions for both the federal monkfish and spiny dogfish fisheries in several Atlantic sturgeon bycatch hotspot areas. Gear restrictions include a year-round requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon and overnight soak time prohibitions in New Jersey and DE/MD/VA during parts of the year for spiny dogfish fishing when more sturgeon takes were observed.

Monkfish Socioeconomic Impacts – Alternative 5

Research (Fox et al. 2019) indicated no significant difference in monkfish catch rates off NJ with the proposed low-profile gear so the baseline related to monkfish should be maintained – moderate positive impacts similar to the No Action/Alternative 1 and more positive compared to Alternatives 2, 3, and 4.

Spiny dogfish Socioeconomic Impacts – Alternative 5

The Councils received public input that the New Jersey overnight soak prohibitions in Alternative 5 (effective in May and November) for spiny dogfish may be feasible for New Jersey fishermen given some already mostly fish without overnight soaks. To the degree that New Jersey participants can fish successfully with this gear restriction, the baseline related to dogfish should be maintained – slight positive impacts similar to the No Action/Alternative 1 and positive compared to Alternatives 2, 3, and 4.

The Councils received public input that the DE/MD/VA overnight soak prohibitions in Alternative 5 (effective in November, December, January, February, and March) for spiny dogfish may not be feasible for MD/VA participants given their standard fishing practices that depend on overnight soaks. To the degree that MD/VA participants cannot fish successfully with this gear restriction there would be negative impacts, and similar to Alternatives 2, 3, and 4 (and negative compared to Alternative 1). The Councils also received input that the Alternative 5 sub-alternatives that exempt gear less than 5.25 inches mesh (i.e., allow 5-inch mesh) would mitigate the negative impacts, possibly resulting in slight positive impacts similar to the No Action/Alternative 1 and positive compared to Alternatives 2, 3, 4, as well as Alternative 5 without the exemption contained in the sub-alternatives.

Sturgeon Socioeconomic Impacts – Alternative 5

Given the following discussion, socioeconomic impacts from Alternative 5 related to the sturgeon resource would likely still be moderate negative, slightly less negative versus No Action/Alternative 1, and probably negligibly different from any of the other action alternatives.

Any population improvements could lead to socioeconomic benefits related to society's value of avoiding sturgeon's extinction. The 2007 Atlantic sturgeon assessment (several quotes from the assessment follow in this paragraph) found that "anthropogenic mortality (e.g., bycatch and ship strikes) may exceed acceptable levels, reducing recovery rates." The assessment also noted that "Changes in carrying capacity coastwide are unknown, though it is assumed freshwater habitat has declined in quality and/or quantity," concluding "that the primary threats to the recovery of Atlantic sturgeon stocks include bycatch mortality, ship strikes, and habitat loss and degradation." Without a traditional assessment model and reference points (which would require "significant investment in collection of basic life history information, expansion of Atlantic sturgeon monitoring efforts, etc."), it is not possible to quantify the population effects of Alternative 5. Given the uncertainty about take reduction, and the uncertainty of the impact of potential take reduction on sturgeon populations amid other threats, the impact difference compared to no action is slight and differences among any action alternatives are likely negligible.

Overall Socioeconomic Impacts – Alternative 5

Given the slightness and uncertainty regarding sturgeon socioeconomic impacts, and that this Alternative should only slightly affect monkfish and spiny dogfish landings, it is predicted to have slight negative socioeconomic impacts, primarily due to having to procure new gear. Impacts would be more negative compared to Alternative 1 and less negative than Alternatives 2,3, and 4.

6.7 CUMULATIVE EFFECTS ANALYSIS

6.7.1 Introduction

A cumulative effects analysis (CEA) is required by the Council on Environmental Quality (CEQ; 40 CFR part 1508.7) and NOAA policy and procedures for NEPA, found in NOAA Administrative Order 216-6A (Companion Manual, January 13, 2017). The purpose of the CEA is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately. The intent is to focus on those effects that are truly meaningful. The following remarks address the significance of the expected cumulative impacts as they relate to the federally managed monkfish fishery.

A cumulative effects assessment makes effect determinations based on a combination of: 1) impacts from past, present, and reasonably foreseeable future actions; 2) the baseline conditions of the VECs (the combined effects from past, present, and reasonably foreseeable future actions plus the present condition of the VEC); and 3) impacts of the alternatives under consideration for this action.

6.7.1.1 Consideration of the Valued Ecosystem Components (VECs)

The valued ecosystem components for the monkfish and spiny dogfish fisheries are generally the “place” where the impacts of management actions occur and are identified in Section 5.0.

- *Target Species (Monkfish and Spiny Dogfish)*
- *Non-target species*
- *Protected resources*
- *Physical environment and Essential Fish Habitat*
- *Human communities*

The CEA identifies and characterizes the impacts on the VECs by the alternatives under consideration when analyzed in the context of other past, present, and reasonably foreseeable future actions.

Geographic Boundaries

The analysis of impacts focuses on actions related to the commercial harvest of monkfish and spiny dogfish. The Western Atlantic Ocean is the core geographic scope for each of the VECs. The core geographic scope for these managed species is the management unit (Section 5.1). For non-target species, that range may be expanded and would depend on the range of each species in the Western Atlantic Ocean. For habitat, the core geographic scope is focused on EFH within the EEZ but includes all habitat utilized by monkfish, spiny dogfish, and non-target species in the Western Atlantic Ocean. The core geographic scope for protected resources is their range in the Western Atlantic Ocean. For human communities, the core geographic boundaries are defined as those U.S. fishing communities in coastal states from Maine to Virginia directly involved in the harvest or processing of monkfish and spiny dogfish (Section 5.5.5).

Temporal Boundaries

Monkfish: Overall, while the effects of the historical monkfish fishery are important and considered in the analysis, the temporal scope of past and present actions for monkfish, non-target species and other fisheries,

the physical environment and EFH, and human communities is primarily focused on actions that occurred after FMP implementation (1999). An assessment using this timeframe demonstrates the changes to resources and the human environment that have resulted through management under the Council process and through U.S. prosecution of the fishery. For protected resources, the scope of past and present actions is focused on the 1980s and 1990s (when NMFS began generating stock assessments for marine mammals and sea turtles that inhabit waters of the U.S. EEZ) through the present.

The temporal scope of future actions for all VECs extends about five years (2029) beyond the implementation of this action. The dynamic nature of resource management for these species and lack of information on projects that may occur in the future make it difficult to predict impacts beyond this timeframe with any certainty. The impacts discussed in Section 6.7.3 are focused on the cumulative effects of the proposed action (i.e., the suite of preferred alternatives) in combination with the relevant past, present, and reasonably foreseeable future actions over these time scales.

Spiny dogfish: The temporal scope of this analysis is focused on actions that have taken place since 1976, when federal fisheries management commenced under the MSA, though the spiny dogfish FMP only began in 2000. For endangered and other protected species, the context is largely focused since the 1980s and 1990s, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ. The temporal scope of this analysis does not extend beyond 2028 because the FMP and the issues facing these fisheries may change in ways that can't be effectively predicted beyond 2028. An assessment using this timeframe demonstrates the changes to resources and the human environment that have resulted through management under the MAFMC process and through U.S. prosecution of the fishery. The impacts discussed herein are focused on the cumulative effects of the proposed action (i.e., the preferred alternative) in combination with the relevant other past, present, and reasonably foreseeable future actions over these time scales.

6.7.2 Relevant Actions Other Than Those Proposed in this Document

This section summarizes the past, present, and reasonably foreseeable future actions and effects that are relevant for this cumulative effects assessment. Some past actions are still relevant to the present and/or future actions.

6.7.2.1 Fishery Management Actions

6.7.2.1.1 Monkfish FMP Actions

Past, present, and reasonably foreseeable future actions for monkfish management include the establishment of the original FMP, all subsequent amendments and frameworks, and the setting of annual specifications (annual catch limits and measures to constrain catch and harvest). Key actions are described below.

Target species related actions

The Monkfish FMP was implemented in 1999, and has been amended several times, most recently in 2023 via Framework Adjustment 13, which set monkfish specifications for fishing years 2023-2025 along with other management measures. The documents pertaining to previous management actions are available on the Monkfish FMP [webpage](#). Haring and Maguire (2008) is a synoptic discussion of the science and management aspects of the FMP up to FW 4 (2007). A detailed discussion of the history of the FMP up to 2023 is in Framework Adjustment 13.

The FY 2023-2025 fishery specifications were implemented through Framework 13 in August 2023. The action was needed to establish allowable monkfish harvest levels that would prevent overfishing. For the NFMA, there was a 25% decrease in the ABC and ACL and a 52% decrease in the ABC and ACL for the SFMA, relative to the 2022 specifications. The impacts of the FY 2023-2025 specifications were generally

similar as [Framework 12](#) since the risk of monkfish overfishing in either management area was similar as previously analyzed and the changes in catch limits were expected to cause little change in fishing behavior, targeting of monkfish or other species, fishing costs, or revenue from landing monkfish.

Monkfish Framework 14 was part of the omnibus action that established the Habitat Area of Particular Concern (HAPC) in Southern New England through framework adjustments to the groundfish, scallop, monkfish, skate, and Atlantic herring plans; this was implemented in February 2024. The HAPC does not directly restrict fishing or non-fishing ocean activities, rather strongly encourages actions to avoid, minimize, or mitigate impacts on habitats within HAPCs. This action was expected to have slight positive impacts on monkfish due to the increased evaluation of conservation recommendations on federally-permitted activities in this area.

Monkfish Amendment 8 was part of the Omnibus Deep-Sea Coral Amendment, implemented in June 2021 (NEFMC 2016). This action included management areas to protect coral habitat from the impacts of fishing gears, provisions to encourage further research on deep-sea corals and fisheries, and measures to facilitate future updates to coral management approaches. This action was expected to have positive impacts on monkfish due to the increased habitat protections implemented.

Non-target species

There are management plans in place for non-target species potentially impacted by this action. Those FMPs managed by the NEFMC include the Northeast Skate Complex FMP, the Northeast Multispecies FMP, and the Scallop FMP. The Spiny Dogfish FMP is jointly managed by the MAFMC and NEFMC.

Physical habitat/EFH

The EFH Omnibus Amendment 2 (Monkfish Amendment 4), effective April 2018, reviewed and updated EFH designations, identified Habitat Areas of Particular Concern, and updated the status of current knowledge of gear impacts. It also implemented new spatial management measures throughout New England for minimizing the adverse impact of fishing on EFH that affect all species managed by the NEFMC. The Council developed a related omnibus framework (Clam Dredge Framework, June 2020, Monkfish Framework 11) that designated three exemption areas within the Great South Channel Habitat Management Area where clam and mussel dredges are allowed. The deep-sea coral amendment Monkfish Amendment 8, effective June 2021, was developed to protect deep-sea coral habitats throughout New England from the negative impacts of fishing gears. The amendment designated the Georges Bank Deep-Sea Coral Protection Zone between the US/Canada EEZ boundary, the boundary between the NEFMC and MAFMC regions, and the seaward boundary of the US EEZ, with the landward boundary at the 600 m contour. The zone is a closure to all bottom-tending gears, with an exemption for the red crab pot fishery. Two mobile bottom-tending gear closures were also implemented in federal waters in eastern Maine.

Protected Resources

As provided in section 6.3.3, to address the high levels of incidental take of harbor porpoise and bottlenose dolphins in sink gillnet fisheries, pursuant to section MMPA Section 118(f)(1), the Harbor Porpoise Take Reduction Plan (HPTRP) and the Bottlenose Dolphin Take Reduction Plan (BDTRP) were developed and implemented for these species. Also, due to the incidental mortality and serious injury of small cetaceans, incidental to bottom and midwater trawl fisheries operating in both the Northeast and Mid-Atlantic regions, the Atlantic Trawl Gear Take Reduction Strategy was implemented. Refer to NMFS HPTRP, NMFS BDTRP, or NMFS Atlantic Trawl Gear Take Reduction Strategy for additional information on each take reduction plan or strategy. In addition, NMFS has also implemented regulations, pursuant to the Atlantic Large Whale Take Reduction Plan (ALWTRP), to reduce serious injury and mortality of large whale species in commercial fixed gear (i.e., trap/pot and gillnet) fisheries; see section 6.5.3 for additional information, as well as NMFS ALWTRP website^{33F}. These voluntary or regulatory measures have had slight to moderate positive impacts on these protected species by reducing the number of interactions with fishing gear.

On May 27, 2021, the NMFS completed formal consultation pursuant to section 7 of the ESA of 1973, as amended, and issued a biological opinion (2021 Opinion) on the authorization of eight FMPs, two interstate fishery management plans (ISFMP), and the implementation of the New England Fishery Management Council's Omnibus Essential Fish Habitat (EFH) Amendment 2. On January 10, 2024, NMFS issued a 7(a)(2)/7(d) memorandum that reinitiated consultation on the 2021 Biological Opinion. Consultation is currently ongoing; additional information on the reinitiation is provided in section 7.4.

Human Communities

All actions taken under the Monkfish FMP have had effects on human communities. Updating catch limits based on the latest scientific information has positive impacts in the long-term from setting fishing limits to ensure the long-term sustainability of the resource. Many actions have included specific measures designed to improve flexibility and increase efficiency from measures such as revising effort controls.

6.7.2.1.2 Spiny dogfish FMP Actions

The historical management practices of the Council have generally resulted in positive impacts on the health of the managed resources. Numerous actions have been taken to manage relevant commercial and recreational fisheries through FMP amendment and FMP framework adjustment actions. The annual (or multi-year) specifications process is intended to provide the opportunity for the Council and NMFS to regularly assess the status of the fisheries and to make necessary adjustments to ensure that there is a reasonable expectation of meeting the objectives of each FMP and the targets associated with any rebuilding programs under the FMP.

The earliest management actions implemented under the Council's FMPs involved the sequential phasing out of foreign fishing for these species in US waters and the development of domestic fisheries. All Council-managed species are considered to be fully utilized by the US domestic fishery to the extent that sufficient availability will result in a full harvest of the various quotas. More recent actions have focused on stock rebuilding, reducing non-target catch and discards, reducing habitat impacts, and reducing protected species impacts. Either permitting or forms of limited access have been established in Council-managed fisheries to monitor and/or control capacity. All Council-managed fisheries have a variety of reporting and monitoring requirements to document catch and facilitate regulatory compliance with a focus on timely and reliable electronic reporting methods. Based on the 2007 MSA reauthorization and the Council's ACL/AM Omnibus Amendment, the SSC now sets an upper limit (ABCs) on catches to avoid overfishing. There is also a Standardized Bycatch Reporting Methodology (SBRM) to evaluate discards and allocate observer coverage. A full list of Council FMPs and their amendments is available at <http://www.mafmc.org/fishery-management-plans>.

Specific actions from this FMP (<https://www.mafmc.org/dogfish>) which had substantial impacts on the spiny dogfish fishery included: rebuilding via the initial FMP, the implementation of ABCs/ACLs in 2011 (Amendment 2), and the 2020 revisions to the Council's risk policy to reduce the probability of overfishing as stock size falls below the target biomass while allowing for increased risk and greater economic benefit under higher stock biomass conditions (Framework 5). Past annual specifications have also limited catches to avoid overfishing. The Council is also planning on revising EFH for all species and considering the impacts of fishing on EFH by 2025.

The NEFMC's omnibus habitat amendment revised EFH and habitat area of particular concern designations for NEFMC-managed species; revised or created habitat management areas, including gear restrictions to protect vulnerable habitat from fishing gear impacts; and established dedicated habitat research areas. This action is expected to have overall positive impacts on habitat and EFH, with expected long-term positive implications for target and nontarget species, while having mixed socioeconomic impacts on various user groups. There are many other FMPs and associated fishery management actions for other species that impacted these VECs over the temporal scale described in Section 7.6.1.3. These include FMPs managed by the Mid-Atlantic Fishery Management Council, New England Fishery Management Council, Atlantic States

Marine Fisheries Commission, and to a lesser extent the South Atlantic Fishery Management Council. Omnibus amendments are also frequently developed to amend multiple FMPs at once. Actions associated with other FMPs and omnibus amendments have generally included (but are not limited to) measures to regulate fishing effort for other species, measures to protect habitat and forage species, and fishery monitoring and reporting requirements.

Fishery management actions within the next five years should generally maintain or restore the sustainability of the stocks and fisheries under management. Measures for fisheries using vertical lines should also reduce impacts on large whales over the next several years, but likewise the degree of impacts is currently uncertain.

As with all the managed resource FMP actions described above, other FMP actions have had positive long-term cumulative impacts on managed and non-target species because they constrain fishing effort and manage stocks at sustainable levels (or rebuild when necessary). As previously stated, constraining fishing effort can have negative short-term socioeconomic impacts and long-term positive impacts. These actions have typically had slight negative impacts on habitat, due to continued fishing operations preventing impacted habitats from recovering; however, some actions had long-term positive impacts through designating or protecting important habitats. FMP actions have also had a range of impacts on protected species, generally slight negative to slight positive, depending on the species and interaction levels as detailed elsewhere in this document.

6.7.2.1.3 Other Fishery Management Actions

In addition to the Monkfish FMP, there are many other FMPs and associated fishery management actions for other species that impacted these VECs over the temporal scale described in Section 6.7.1.1. These include FMPs managed by the MAFMC, NEFMC, ASMFC, and to a lesser extent the SAFMC. Omnibus amendments are also frequently developed to amend multiple FMPs at once. Actions associated with other FMPs and omnibus amendments have included measures to regulate fishing effort for other species, measures to protect habitat and forage species, and fishery monitoring and reporting requirements.

Those FMPs managed by the NEFMC that the monkfish fishery interacts with the most include the Northeast Skate Complex FMP, the Northeast Multispecies FMP, and the Scallop FMP. The Spiny Dogfish FMP is jointly managed by the MAFMC and NEFMC.

6.7.2.1.4 Fishery Management Action Summary

The Councils and NOAA Fisheries have taken many actions to manage the commercial monkfish and spiny dogfish fisheries and associated fisheries in their jurisdictions. The MSA is the statutory basis for federal fisheries management. The cumulative impacts on the VECs of past, present, and reasonably foreseeable future federal fishery management actions under the MSA should generally be associated with positive long-term outcomes because they constrain fishing effort and manage stocks at sustainable levels. Constraining fishing effort through regulatory actions can have negative short-term social and economic impacts. These impacts are sometimes necessary to bring about long-term sustainability of a resource, and as such should promote positive effects on human communities in the long-term.

6.7.2.2 Non-Fishing Impacts

6.7.2.2.1 Other Human Activities

Non-fishing activities that occur in the marine nearshore and offshore environments and connected watersheds can cause the loss or degradation of habitat and/or affect the fish and protected species that utilize those areas. The impacts of most nearshore, human-induced, non-fishing activities tend to be localized in the areas where they occur, although effects on species could be felt throughout their populations since many marine organisms are highly mobile. For offshore projects, some impacts may be localized while others may

have regional influence, especially for larger projects. The following discussion of impacts is based on past assessments of activities and assumes these activities will continue as projects are proposed.

Examples of non-fishing activities include point source and non-point source pollution, shipping, dredging/deepening, wind energy development, oil and gas development, construction, and other activities. Specific examples include at-sea disposal areas, oil and mineral resource exploration, aquaculture, construction of offshore wind farms, and bulk transportation of petrochemicals. Episodic storm events and the restoration activities that follow can also cause impacts. The impacts from these activities primarily stem from habitat loss due to human interaction and alteration or natural disturbances. These activities are widespread and can have localized impacts on habitat related to accretion of sediments, pollutants, habitat conversion, and shifting currents and thermoclines. For protected species, primary concerns associated with non-fishing activities include vessel strikes, dredge interactions (especially for sea turtles and sturgeon), and underwater noise. These activities have both direct and indirect impacts on protected species. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and as such may indirectly constrain the productivity of managed species, non-target species, and protected species. Decreased habitat suitability tends to reduce the tolerance of these VECs to the impacts of fishing effort. Non-fishing activities can cause target, non-target, and protected species to shift their distributions away from preferred areas and may lead to decreased reproductive ability and success (from current changes, spawning disruptions, and behavior changes), disrupted or modified food web interactions, and increased disease. While localized impacts may be more severe, the overall impact on the affected species and their habitats on a population level is unknown, but likely to have impacts that mostly range from no impact to slight negative, depending on the species and activity.

Non-fishing activities permitted by other Federal agencies (e.g., beach nourishment, offshore wind facilities) require examinations of potential impacts on the VECs. The MSA imposes an obligation on other Federal agencies to consult with the Secretary of Commerce on actions that may adversely affect EFH (50 CFR 600.930). NOAA Fisheries and the eight regional fishery management councils engage in this review process by making comments and recommendations on federal or state actions that may affect habitat for their managed species. Agencies need to respond to, but do not necessarily need to adopt these recommendations. Habitat conservation measures serve to potentially minimize the extent and magnitude of indirect negative impacts federally-permitted activities could have on resources under the jurisdiction of NOAA Fisheries. In addition to guidelines mandated by the MSA, NMFS evaluates non-fishing effects during the review processes required by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for certain activities that are regulated by Federal, state, and local authorities. Non-fishing activities must also meet the mandates under the ESA, specifically Section 7(a)(2)²¹, which ensures that agency actions do not jeopardize the continued existence of endangered species and their critical habitat.

In recent years, offshore wind energy and oil and gas exploration have become more relevant activities in the Greater Atlantic region. They are expected to impact all VECs, as described below.

Impacts of offshore wind energy development on Biological Resources (Target species, Non-target species, Protected Species) and the Physical Environment

Construction activities may have both direct and indirect impacts on marine resources, ranging from temporary changes in distribution to injury and mortality. Impacts could occur from changes to habitat in the areas of wind turbines and cable corridors and increased vessel traffic to and from these areas. Species that reside in affected wind farms year-round may experience different impacts than species that seasonally reside in or migrate through these areas. Species that typically reside in areas where wind turbines are installed may return to the area and adapt to habitat changes after construction is complete. Inter-array and electricity

21 “Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an “agency action”) is unlikely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat.”

export cables will generate electromagnetic fields, which can affect patterns of movement, spawning, and recruitment success for various species. Effects will depend on cable type, transmission capacity, burial depth, and proximity to other cables. Substantial structural changes in habitats associated with cables are not expected unless cables are left unburied (see below). However, the cable burial process may alter sediment composition along the corridor, thereby affecting infauna and emergent biota. Taormina et al. (2018) provide a recent review of various cable impacts, and Hutchinson et al. (2020) and Taormina et al. (2020) examine the effects of electromagnetic fields in particular.

The full build out of offshore wind farms will result in broad habitat alteration. The wind turbines will alter hydrodynamics of the area, which may affect primary productivity and physically change the distribution of prey and larvae. It is not clear how these changes will affect the reproductive success of marine resources. Scour and sedimentation could have negative effects on egg masses that attach to the bottom. Benthic habitat will be altered due to the placement of scour protection at wind turbine foundations, and over cables that are not buried to target depth in the sediment, converting soft substrates into hard substrates. This could alter species composition and predator/prey relationships by increasing favorable habitat for some species and decreasing habitat for others. The placement of wind turbines will also establish new vertical structure in the water column, which could serve as reefs for bottom species, fish aggregating devices for pelagic species, and substrate for the colonization of other species, e.g. mussels. Various authors have studied these types of effects (e.g., Bergström *et al.* 2013; Dannheim *et al.* 2019; Degraer *et al.* 2019; Langhamer 2012; Methratta & Dardick 2019; Stenberg *et al.* 2015).

Elevated levels of sound produced during site assessment activities, construction, and operation of offshore wind facilities will impact the soundscape.²² Temporary, acute, noise impacts from construction activity could impact reproductive behavior and migration patterns; the long-term impact of operational noise from turbines may also affect behavior of fish and prey species, through both vibrations in the immediate area surrounding them in the water column, and through the foundation into the substrate. Depending on the sound frequency and source level, noise impacts to species may be direct or indirect (Finneran 2015; 2016; Madsen *et al.* 2006; Nowacek *et al.* 2007; NRC 2000; 2003; 2005; Piniak 2012; Popper *et al.* 2014; Richardson *et al.* 1995; Thomsen *et al.* 2006). Exposure to underwater noise can directly affect species via behavioral modification (avoidance, startle, spawning) or injury (Bailey *et al.* 2014; Bailey *et al.* 2010; Bergström *et al.* 2014; Ellison *et al.* 2011; Ellison *et al.* 2018; Forney *et al.* 2017; Madsen *et al.* 2006; Nowacek *et al.* 2007; NRC 2003; 2005; sound exposure resulting in internal damage to hearing structures or internal organs; Richardson *et al.* 1995; Romano *et al.* 2004; Slabbekoorn *et al.* 2010; Thomsen *et al.* 2006; Wright *et al.* 2007). Indirect effects are likely to result from changes to the acoustic environment of the species, which may affect the completion of essential life functions (e.g., migrating, breeding, communicating, resting, foraging; Forney *et al.* 2017; Richardson *et al.* 1995; Slabbekoorn *et al.* 2010; Thomsen *et al.* 2006).²³

Wind farm survey and construction activities and turbine/cable placement will substantially affect NOAA Fisheries scientific research surveys, including stock assessment surveys for fisheries and protected species²⁴ and ecological monitoring surveys. Disruption of such scientific surveys could increase scientific uncertainty in survey results and may significantly affect the ability to monitor the health, status, and behavior of marine resources and protected species and their habitat use within this region. Based on existing regional Fishery Management Councils' ABC control rule processes and risk policies (e.g., 50 CFR §§ 648.20 and 21), increased assessment uncertainty could result in lower commercial quotas and recreational harvest limits that may reduce the likelihood of overharvesting and mitigate associated biological impacts on fish stocks. However, this would also result in lower associated fishing revenue and reduced recreational fishing

22 See NMFS Ocean Noise Strategy Roadmap: https://cetsound.noaa.gov/Assets/cetsound/documents/Roadmap/ONS_Roadmap_Final_Complete.pdf

23 See NMFS Ocean Noise Strategy Roadmap (footnote #2)

24 Changes in required flight altitudes due to proposed turbine height would affect aerial survey design and protocols (BOEM 2020a).

opportunities, which could result in indirect negative impacts on fishing communities. It is possible that new survey technologies will be developed that mitigate these impacts, but it is uncertain whether they will be developed, and (or) how quickly they can be adopted. NOAA and BOEM published a survey mitigation strategy in December 2022.²⁵

Impacts of Offshore Wind Energy Development on Social and Economic Resources

Several potential offshore wind energy sites have been leased or identified for future wind energy development in federal waters from Massachusetts to North Carolina (Map 2). According to BOEM, approximately 22 gigawatts (close to 2,000 wind turbines based on current technology) of Atlantic offshore wind development via 17 projects are reasonably foreseeable along the east coast (BOEM 2020). Offshore wind energy development is well underway within the lease areas off Rhode Island and Massachusetts. The monkfish and spiny dogfish fisheries have been active in the Massachusetts/Rhode Island and Mid-Atlantic lease areas and are expected to be for the near future. As of April 2024, two projects, South Fork Wind (12 turbines) and Vineyard Wind 1 (62 turbines), have construction well underway. Revolution Wind was permitted by BOEM during 2023, but construction has not yet begun, though boulder fields are being relocated as of April 2024. Permits were also issued for Sunrise Wind (Rhode Island) and New England Wind (formerly Vineyard Wind South). Other projects in the New England area are earlier in the site assessment and planning phases. NEFMC recommended a Habitat Area of Particular Concern overlapping the Southern New England lease areas to promote conservation of cod spawning grounds and complex benthic habitats. A final rule on this measure was published in February 2024.

Further south, Empire Wind (New York) was permitted in 2023 and had its Construction and Operations Plan approved by BOEM in February 2024, but construction has not yet begun; Ocean Wind 1 was initially permitted, however, BOEM approved a two-year suspension of the operations term of Ocean Wind LLC's commercial lease on February 29, 2024. Other projects in the mid-Atlantic are also under development. Two new lease areas were announced in the Central Atlantic in December 2023, one off Delaware/Maryland, and one off Virginia. These lease areas will be auctioned in 2024. In the New York Bight, lease sales are expected in 2027.

Some east coast offshore wind projects, including New England Wind (formerly Vineyard Wind South, formerly Commonwealth Wind and Park City Wind), Revolution Wind II, Empire Wind I and II, Beacon Wind, Sunrise Wind, and Ocean Wind II are seeking new power purchase agreements (PPAs) as of April 2024, which lends uncertainty to the construction timelines for these projects, even for those already permitted. In addition, on April 19, 2024, the third offshore wind solicitation in NY concluded with no final awards being made due to the inability to secure the expected 18 MW offshore wind turbines, further adding to the timing uncertainty for offshore wind development in these areas.

BOEM began a planning process for the Gulf of Maine via a regional intergovernmental renewable energy task force (<https://www.boem.gov/Gulf-of-Maine>). As of April 2024, BOEM issued Final Wind Energy Areas for the Gulf of Maine. BOEM is targeting lease issuance and an auction towards the end of 2024, with a proposed sale notice expected soon. Given the water depth in the region, floating turbines will likely be the primary type of wind turbine foundations to be deployed. It is unclear where development might occur in the Gulf of Maine, but the Final WEA overlaps monkfish fishing areas.

The social and economic impacts of offshore wind energy on fisheries could be generally negative due to the overlap of wind energy areas with productive groundfish fishing grounds. Impacts may vary by year based on species availability. It remains unclear exactly how fishing or transiting to and from fishing grounds might be affected by the presence of a wind farm. While no offshore wind developers have expressed an intent to exclude fishing vessels from wind turbine arrays once construction is complete, it could be difficult for operators to tow bottom-tending mobile gear or transit amongst the wind turbines, depending on the spacing

²⁵ <https://www.fisheries.noaa.gov/resource/document/federal-survey-mitigation-strategy-northeast-us-region>

and orientation of the array and weather conditions²⁶. Floating wind farms are likely to cause greater displacement of fishing activity as compared to fixed turbines given the presence of floating inter-array cables and anchoring systems. If vessel operators choose to avoid fishing or transiting within wind farms, effort displacement and additional steaming time could result in negative socioeconomic impacts to affected communities, including increased user conflicts, decreased catch and associated revenue, safety concerns, and increased fuel costs. If vessels elect to fish within wind farms, effects could be both positive due to potential increased recreational catch and negative due to reduced commercial fishery catch and associated revenue, user conflicts, gear damage/loss, and increased risk of allision or collision.

Turbine structures could increase the presence of and recreational fishing for structure affiliated species, including some groundfish species such as cod. This could potentially lead to socioeconomic benefits in terms of increased for-hire fishing revenues and angler satisfaction in certain wind development areas. There could also be social and economic benefits in the form of jobs associated with construction and maintenance, and replacement of some electricity generated using fossil fuels with renewable sources (AWEA 2020).

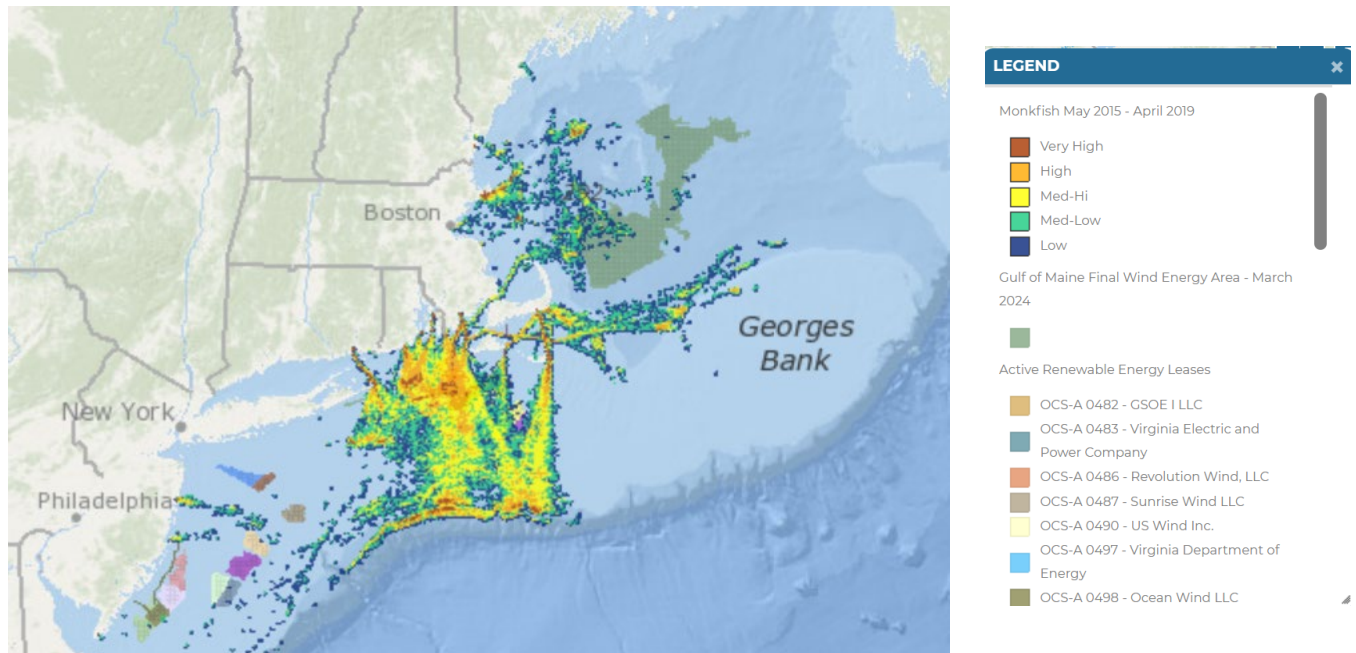
As the number of wind farms increases, so too would the level and scope of impacts to affected habitats, marine resources, and human communities. Development of these areas may cause regional changes to fishing practices which could cause indirect effects on the groundfish resource and fishery. Overall, this analysis represents only a rough approximation of potential negative and positive effects from offshore wind energy development.

Offshore Energy Summary

The overall impact of offshore wind energy and oil and gas exploration on the affected species and their habitats at a population level is unknown, but likely to range from no impact to moderate negative, depending on the number and locations of projects that occur. The individual project phases (site assessment, construction, operation, and decommissioning) as well as different aspects of the technology (foundations, cables/pipelines, turbines) will have varying impacts on resources. Mitigation efforts, such as habitat conservation measures, time of year construction restrictions, layout modifications, and fishery compensation funds could lessen the magnitude of negative impacts as well. The overall impact on socioeconomic resources is likely slight positive to moderate negative; potentially positive due to a potential increase in jobs and recreational fishing opportunities, but negative due to displacement and disruption of commercial fishing effort.

²⁶ The United States Coast Guard has considered transit and safety issues related to the Massachusetts and Rhode Island lease areas in a recent port access route study and has recommended uniform 1 mile spacing in east-west and north-south directions between turbines to facilitate access for fishing, transit, and search and rescue operations. Future studies in other regions could result in different spacing recommendations (UCSG 2020).

Map 2. Monkfish FMP vessel activity relative to wind energy active lease areas and Gulf of Maine Final Wind Energy Areas.



Source: Map generated from [Northeast Ocean Data Portal](#) on April 23, 2024.

Notes: Colored polygons are active renewable lease areas. Heat map is monkfish fishery Vessel Monitoring System activity, FY 2015-2019.

A similar figure for spiny dogfish was not generated given very low VMS use.

6.7.2.2.2 Global Climate Change

Global climate change affects all components of marine ecosystems, including human communities. Physical changes that are occurring and will continue to occur to these systems include sea-level rise, changes in sediment deposition; changes in ocean circulation; increased frequency, intensity, and duration of extreme climate events; changing ocean chemistry; and warming ocean temperatures. The rates of physical and chemical changes in marine ecosystems have been most rapid in recent decades (Johnson *et al.* 2019). Emerging evidence demonstrates that these physical changes are resulting in direct and indirect ecological responses within marine ecosystems, which may alter the fundamental production characteristics of marine systems (Stenseth *et al.* 2002). The general trend of changes can be explained by warming causing increased ocean stratification, which reduces primary production, lowering energy supply for higher trophic levels and changing metabolic rates. Different responses to warming can lead to altered food-web structures and ecosystem-level changes. Shifts in spatial distribution are generally to higher latitudes (i.e., poleward) and to deeper waters as species seek cooler waters within their normal temperature preferences. Climate change will also potentially exacerbate the stresses imposed by fishing and other non-fishing human activities and stressors. Survival of marine resources under a changing climate depends on their ability to adapt to change, but also how and to what degree those other human activities influence their natural adaptive capacity.

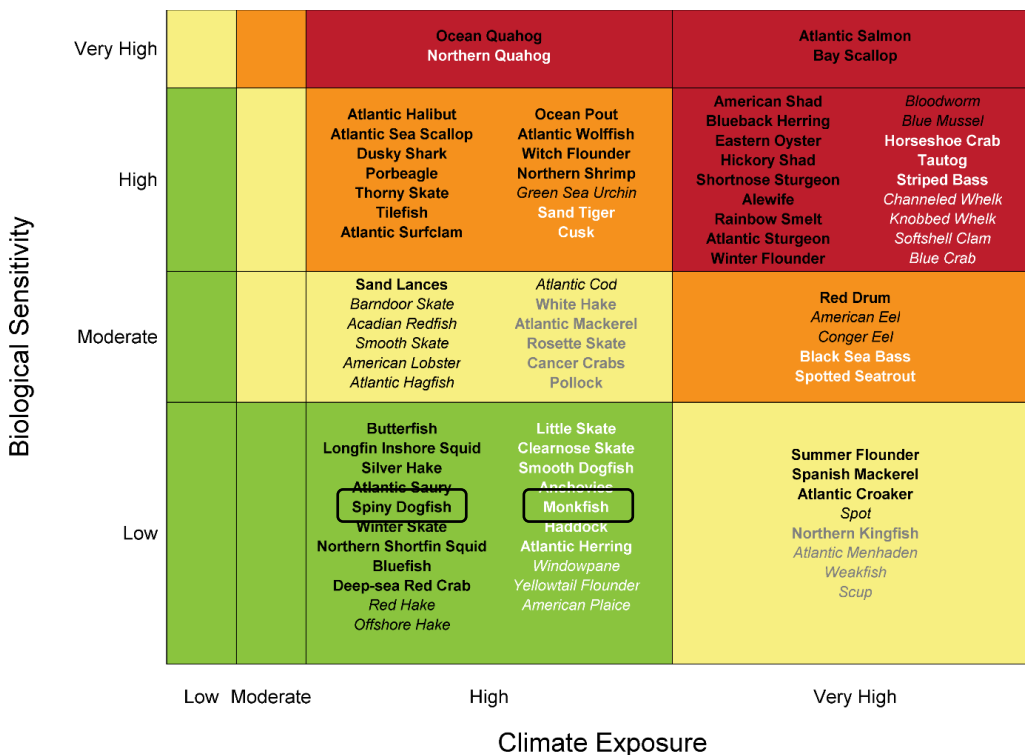
Results from the Northeast Fisheries Climate Vulnerability Assessment indicate that climate change could have impacts on Council-managed species that range from negative to positive, depending on the adaptability of each species to the changing environment (Hare *et al.* 2016).

Based on this assessment, monkfish scored as having low climate vulnerability and low biological sensitivity to climate change. Overall vulnerability results for additional Greater Atlantic species, including most of the

non-target species identified in this action, are in Figure 40 (Hare *et al.* 2016). While the effects of climate change may benefit some habitats and the populations of species through increased availability of food and nutrients, reduced energetic costs, or decreased competition and predation, a shift in environmental conditions outside the normal range can result in negative impacts for those habitats and species unable to adapt. This, in turn, may lead to higher mortality, reduced growth, smaller size, and reduced reproduction or populations. Thus, already stressed populations are expected to be less resilient and more vulnerable to climate impacts. Climate change is expected to have impacts that range from positive to negative depending on the species. However, future mitigation and adaptation strategies to climate change may mitigate some of these impacts. The science of predicting, evaluating, monitoring, and categorizing these changes continues to evolve. The social and economic impacts of climate change will depend on stakeholder and community dependence on fisheries, and their capacity to adapt to change. Commercial and recreational fisheries may adapt in different ways, and methods of adaptation will differ among regions. In addition to added scientific uncertainty, climate change will introduce implementation uncertainty and other challenges to effective conservation and management.

Regarding climate change, the incremental effects of this proposed action would be negligible to slight positive as fishery effort is expected to be similar if not reduced relative to status quo.

Figure 40. Overall climate vulnerability score for Greater Atlantic species, with monkfish and spiny dogfish highlighted with black boxes.



Note: Overall climate vulnerability is denoted by color: low (green), moderate (yellow), high (orange), and very high (red). Certainty in score is denoted by text font and text color: very high certainty (>95%, black, bold font), high certainty (90–95%, black, italic font), moderate certainty (66–90%, white or gray, bold font), low certainty (<66%, white or gray, italic font).

Source: Hare et al. (2016).

6.7.3 Magnitude and Significance of Cumulative Effects

In determining the magnitude and significance of the cumulative impacts of the proposed action, the incremental impacts of the direct and indirect impacts should be considered, on a VEC-by-VEC basis, in addition to the effects of all actions (those identified and discussed relative to the past, present, and reasonably foreseeable future actions of both fishing and non-fishing actions). Table 2 summarizes the likely impacts of management alternatives contained in this action. The CEA baseline that, as described above in Section 6.7.2 represents the sum of past, present, and reasonably foreseeable future actions and conditions of each VEC. When an alternative has a positive impact on the VEC, for example, reduced fishing mortality on a managed species, it has a positive cumulative effect on the stock size of the species when combined with “other” actions that were also designed to increase stock size. In contrast, when an alternative has negative effects on a VEC, such as increased mortality, the cumulative effect on the VEC would be negative and tend to reduce the positive effects of the other actions. The resultant positive and negative cumulative effects are described below for each VEC. As in Section 6.7.2.2, non-fishing impacts on the VECs generally range from no impact to slight negative.

6.7.3.1 Magnitude and Significance of Cumulative Effects on Target Species

Past fishery management actions taken through the Monkfish and Spiny Dogfish FMPs have ensured that stocks are managed sustainably and that measures are consistent with the objectives of the FMP under the guidance of the MSA. The impacts of specifications are largely dependent on how effective those measures are in meeting the objectives of preventing overfishing and achieving optimum yield, and on the extent to which mitigating measures (e.g., accountability measures) are effective; however, these actions have generally had a positive cumulative effect on the monkfish and spiny dogfish. It is anticipated that the future management actions will have additional indirect positive effects on the target species through actions which reduce and monitor bycatch, protect habitat, and protect the ecosystem services on which the productivity of the target species depends.

As noted in Section 6.2, the proposed action is not expected to result in significant changes of fishing effort nor changes to the character of that effort relative to current conditions. Therefore, impacts of the fisheries on target species are not expected to change relative to current conditions under the proposed action (i.e., generally negligible to slight positive for both target species). The proposed actions described in this document would positively reinforce the past and anticipated positive cumulative effects on target species by achieving the objectives specified in the FMPs.

When the direct and indirect effects of the proposed action are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), *the cumulative effects on monkfish and spiny dogfish are expected to yield non-significant impacts, ranging from negligible to slight positive impacts.*

6.7.3.2 Magnitude and Significance of Cumulative Effects on Non-target Species

The combined impacts of past federal fishery management actions on non-target species have been mixed, as decreased effort and reduced catch of non-target species continue, though some stocks are in poor status (Section 5.2). Current regulations continue to manage for sustainable stocks, thus controlling effort on direct and discard/bycatch species. As noted in Section 6.3, the proposed action would likely continue this trend. Future actions are anticipated to continue rebuilding non-target species stocks and limit the take of incidental/bycatch in the monkfish fishery. Continued management of directed stocks will also control catch of non-target species.

As noted in Section 6.3, the proposed action is not expected to result in significantly different levels of fishing effort or changes to the character of that effort relative to current conditions. Therefore, impacts of the

fishery on non-target species are not expected to change relative to the current condition under the proposed action (i.e., negligible for non-target species). The proposed actions in this document would positively reinforce past and anticipated cumulative effects on non-target species by achieving the objectives in the FMP.

When the direct and indirect effects of the proposed action are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), *the cumulative effects on non-target species are expected to yield non-significant negligible impacts.*

6.7.3.3 Magnitude and Significance of Cumulative Effects on Protected Resources

Given their life history dynamics, large changes in protected species abundance over long time periods, and the multiple and wide-ranging fisheries management actions that have occurred, the cumulative impacts on protected species were evaluated over a long-time frame (i.e., from the early 1970s when the MMPA and ESA were implemented through the present).

Taking into consideration the above information and information provided in Section 5.6, past fishery management actions taken through the respective FMPs and annual specifications process have had slight indirect positive cumulative effects on protected species. The actions have constrained fishing effort both at a large scale and locally, and have implemented, pursuant to the ESA, MMPA, or MSA, gear modifications, requirements, and management areas. These measures and/or actions have served to reduce interactions between protected species and fishing gear. It is anticipated that future management actions, described in Section 6.7.2.1 will result in mixed effects on protected species, as continued catch and effort controls are likely to reduce gear encounters.

As noted in Section 6.4, the proposed action is not expected to result in significantly different levels of fishing effort or changes to the character of that effort relative to current conditions, however, the fishing restriction measures are designed to reduce interactions with Atlantic sturgeon. These measures are not intended to facilitate additional fishing opportunities given the focus of this action is to reduce interactions with an endangered species. Therefore, the impacts of the fisheries on Atlantic sturgeon and potentially indirectly on other protected species would likely be positive. The proposed actions in this document would positively reinforce past and anticipated cumulative effects on protected resources by achieving the objectives in the FMP.

When the direct and indirect effects of the proposed action are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), *the cumulative effects are expected to yield negligible or non-significant slightly positive impacts.*

6.7.3.4 Magnitude and Significance of Cumulative Effects on Physical Environment

Past fishery management actions taken through the Monkfish and Spiny Dogfish FMPs have had positive cumulative effects on habitat. The actions have constrained fishing effort both at a large scale and locally and have implemented gear requirements which may reduce impacts on habitat. As required under these FMP actions, EFH and Habitat Areas of Particular Concern were designated for the managed resources. It is anticipated that the future management actions will result in additional direct or indirect positive effects on habitat through actions which protect EFH and protect ecosystem services on which these species' productivity depends.

Many additional non-fishing activities (Section 6.7.2.2) are concentrated near-shore and likely work either additively or synergistically to decrease habitat quality. The effects of these actions, combined with impacts resulting from years of commercial fishing activity, have negatively affected habitat. These impacts could be broad in scope. The VECs are interrelated; therefore, the linkages among habitat quality, managed resources and non-target species productivity, and associated fishery yields should be considered. Some actions, such

as coastal population growth and climate change may indirectly impact habitat and ecosystem productivity; however, these actions are beyond the scope of NMFS and Council management. Reductions in overall fishing effort and protection of sensitive habitats have mitigated some negative effects.

As noted in Section 6.5, the proposed action is not expected to result in significantly different levels of fishing effort or changes to the character of that effort relative to current conditions. The impacted areas have been fished for many years with many different gear types and therefore will be unlikely to be further impacted by these measures, especially because gillnet gear does not adversely affect EFH. Generally, continued fishing effort in both the monkfish and spiny dogfish fisheries will continue to impact habitats across all gear types. Therefore, the impacts of the fisheries on the physical environment are not expected to change relative to the current condition under the proposed action (i.e., negligible to slight negative).

When the direct and indirect effects of the proposed action are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), *the cumulative effects on the physical environment and EFH are expected to yield non-significant impacts, ranging from negligible to slight negative impacts.*

6.7.3.5 Magnitude and Significance of Cumulative Effects on Human Communities

Past fishery management actions taken through the Monkfish and Spiny Dogfish FMPs have had both positive and negative cumulative effects on human communities. They have benefitted domestic fisheries through sustainable fishery management but can also reduce participation in fisheries. The impacts from specification of management measures are largely dependent on how effective those measures are in meeting their intended objectives and the extent to which mitigating measures (e.g., accountability measures) are effective. Quota overages may alter the timing of commercial fishery revenues such that revenues can be realized a year earlier. Fishermen may be impacted by reduced revenues in years which the overages are deducted.

It is anticipated that the future management actions will result in positive effects for human communities due to sustainable management practices, although additional indirect negative effects on some human communities could occur if management actions result in reduced revenues. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to human communities have had overall positive cumulative effects. Despite the potential for negative short-term effects on human communities due to reduced revenue, positive long-term effects are expected due to the long-term sustainability of the managed stocks.

By providing revenues and contributing to the overall functioning of and employment in coastal communities, the monkfish and spiny dogfish fisheries have both direct and indirect positive social impacts. As described in Section 6.6, the proposed action is unlikely to result in substantial changes to levels of fishing effort or the character of that effort relative to current conditions. Through implementation of this action, the Councils seek to achieve the primary objective of the MSA, which is to achieve OY from the managed fisheries.

When the direct and indirect effects of the proposed action are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), *the cumulative effects on human communities are expected to yield non-significant slight positive impacts.*

6.7.4 Proposed Action on all the VECs

The Councils' proposed action is described in Section 4.0. The direct and indirect impacts of the proposed action on the VECs are described in Sections 6.2 to 6.6 and are summarized in the Executive Summary (Section 1.0). The magnitude and significance of the cumulative effects (e.g., additive and synergistic effects of the proposed actions, as well as past, present, and future actions) have been considered.

When considered in conjunction with all other pressures placed on the fisheries by past, present, and reasonably foreseeable future actions, the proposed action (i.e., year-round low-profile gillnet gear requirement off NJ in the monkfish fishery; overnight soak prohibition off NJ and DE/MD/VA in the spiny dogfish fishery, with some exceptions with vessels using smaller mesh) is not expected to result in any significant impacts, positive or negative.

The proposed action is consistent with other management measures that have been implemented in the past for the monkfish and spiny dogfish fisheries and are part of a broader management scheme for these fisheries. This management scheme has helped to rebuild stocks and ensure long-term sustainability, while minimizing environmental impacts.

The regulatory atmosphere within which federal fishery management operates requires that management actions be taken in a manner that will optimize the conditions of managed species, habitat, and human communities. Consistent with NEPA, the MSA requires that management actions be taken only after consideration of impacts to the biological, physical, economic, and social dimensions of the human environment. Given this regulatory environment, and because fishery management actions must strive to create and maintain sustainable resources, impacts on all VECs from past, present and reasonably foreseeable future actions have generally been positive and are expected to continue in that manner for the foreseeable future. This is not to say that some aspects of the VECs are not experiencing negative impacts, but rather that when considered as a whole, and due to the management measures implemented in these fisheries, the overall long-term trend is slight positive.

There are no significant cumulative effects associated with the preferred alternatives based on the information and analyses presented in this document and in past Monkfish and Spiny Dogfish FMP documents (Table 49). Cumulatively, through 2028, it is anticipated that the proposed action will result in non-significant impacts on all VECs, ranging from slight negative to moderate positive.

Table 49. Summary of Cumulative Effects of the Preferred Alternatives.

	Target Species	Non-Target Species	Protected Resources	Habitat/EFH	Human Communities
Direct/Indirect Impacts of Preferred Alternative	Negligible to slight positive	Negligible	Moderately negative to slight positive	Negligible to slight negative	Slight Positive
Combined Cumulative Effects Assessment Baseline Conditions	Positive	Slight Positive	Slight negative to slight positive	Slight Negative	Slight Positive
Cumulative Effects	Negligible to slight positive	Negligible to slight positive	Slight negative to slight positive	Slight Negative	Slight Positive

7.0 APPLICABLE LAWS/EXECUTIVE ORDERS

7.1 MAGNUSON-STEVEN'S FISHERY CONSERVATION AND MANAGEMENT ACT

7.1.1 National Standards

Section 301 of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires that regulations implementing any fishery management plan or amendment be consistent with ten national standards. Below is a summary of how this action is consistent with the National Standards and other required provisions of the Magnuson-Stevens Act.

National Standard 1. The proposed action is consistent with National Standard 1, because it will likely prevent overfishing, while achieving optimum yield for managed species and the U.S. fishing industry on a continuing basis. Although the stock status of monkfish is unknown and spiny dogfish is neither overfished nor experiencing overfishing in 2022 (Section 5.1), the measures implemented through this action should further achieve the goals/objectives and reduce the possibility of overfishing the monkfish and spiny dogfish resources.

National Standard 2. The proposed action is consistent with National Standard 2, because it was informed by the most recently available fisheries-independent data from several surveys, commercial fishery landings data, stock assessments, and other scientific data sources. The proposed management measures to reduce sturgeon bycatch in the commercial monkfish and spiny dogfish fisheries are supported by the best available scientific information. The supporting science and analyses, upon which the proposed action is based, are summarized and described in Sections 5.0 and 6.0.

National Standard 3. The proposed action is consistent with National Standard 3, because monkfish and spiny dogfish are managed throughout their range in U.S. waters. While most monkfish are landed in Massachusetts and Rhode Island, monkfish landings have been reported in every state from Maine through Virginia. Based on the different operations of the monkfish fishery in the NFMA and SFMA, the FMP established a two-area management program for monkfish that covers the exploitable range of the species. As stated in FW 7, the NEFMC and MAFMC considered a single-stock approach, but rejected it, based in part, on scientific information from SARC 34 (NEFSC 2002) that concluded information was insufficient to determine whether to manage monkfish as one or two monkfish stocks. For spiny dogfish, the most recent landings were in Massachusetts, Virginia, and New Jersey.

National Standard 4. The proposed action is consistent with National Standard 4, because it does not discriminate between residents of different states. The two-area management program for monkfish is based on differences in the fisheries between the two areas, and not based on allocating fishing privileges differently among sectors of the industry. While the proposed action does not discriminate among residents of different states and permit holders for both monkfish and spiny dogfish, it does have different impacts on different participants.

National Standard 5. The proposed action is consistent with National Standard 5, because it promotes efficiency in the use of fishery resources through appropriate measures intended to provide access to the monkfish and spiny dogfish fisheries for both current and historical participants while minimizing the race to fish in any of the monkfish and spiny dogfish management areas, and the management measures do not have economic allocation as their sole purpose.

National Standard 6. The proposed action is consistent with National Standard 6, because changes in fisheries occur continuously, both as the result of human activity (for example, new technologies or shifting market demand) and natural variation (for example, oceanographic perturbations). In order to provide the

greatest flexibility possible for future management decisions, the fishery management plans include a framework adjustment mechanism with an extensive list of possible framework adjustment measures that can be used to quickly adjust the plan as conditions in the fishery change. Specifications are also reviewed annually for both fisheries and can be amended as appropriate.

National Standard 7. The proposed action is consistent with National Standard 7, because the Council considered the costs and benefits associated with the proposed management measures to reduce sturgeon bycatch in the commercial monkfish and spiny dogfish fisheries to ensure compliance with the ESA. Any costs incurred due to the management action proposed in this document are necessary to achieve the goals and objectives of the Monkfish and Spiny Dogfish FMPs and are expected to be outweighed by the benefits of taking the management action. Consistent with National Standard 7, the management measures proposed in this document are not duplicative and were developed in close coordination with NMFS, the MAFMC, and other interested entities.

National Standard 8. The proposed action is consistent with National Standard 8, because the importance of fishery resources to fishing communities is considered, and it provides for their sustained participation while minimizing adverse economic impacts. A description of the fishing communities participating in and depending on the monkfish and spiny dogfish fisheries is in Section 5.5. Relative to the No Action alternative, the measures proposed are expected to have minimal impacts on communities engaged in and dependent on the monkfish and spiny dogfish fisheries while preventing overfishing.

National Standard 9. The proposed action is consistent with National Standard 9, because it is expected to slightly decrease fishing effort, and therefore, is not expected to change bycatch levels of non-target species. Section 5.2 of this document has comprehensive information related to bycatch in the monkfish and spiny dogfish fisheries. The primary non-target species in these fisheries are skate species. The overall impact on non-target species will be negligible, and a change in discarding of certain species (some skate species) is not expected.

National Standard 10. The proposed action is consistent with National Standard 10, because none of the measures are expected to create unsafe conditions and situations at sea.

7.1.2 Other MSA Requirements

This action is also consistent with the fourteen additional required provisions for FMPs. Section 303 (a) of MSA contains required provisions for FMPs.

1. *Contain the conservation and management measures, applicable to foreign fishing ...*
Foreign fishing is not allowed under the Monkfish and Spiny Dogfish FMPs, or this action and so specific measures are not included that specify and control allowable foreign catch. The proposed action is designed to reduce sturgeon bycatch in the commercial monkfish and spiny dogfish fisheries to ensure compliance with the ESA. There are no international agreements that are germane to the management of monkfish or spiny dogfish.
2. *Contain a description of the fishery ...*
All the information required by this provision can be found in the Final EIS for the FMPs and Section 5.0 of this action.
3. *Assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from the fishery ...*
The present and probable future condition of the monkfish resource was updated through the most recent monkfish management track assessment in 2022. There was a Spiny Dogfish Management Track Assessment in 2023 that determined the stock status and included projections that predicted that relatively low future catches are needed to stay at the target biomass and fishing mortality

figures. Information related to the monkfish and spiny dogfish stock assessments and updated biological reference points are summarized in Section 5.1 of this document.

4. *Assess and specify-- (A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3); etc.*

Based on past performance, if spiny dogfish and monkfish are sufficiently abundant and available, the domestic fishery has the desire and ability to fully harvest the available quotas, and domestic processors can process the fish.

5. *Specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, and charter fishing in the fishery ...*

Data regarding the type and quantity of fishing gear used, catch by species, areas fished, season, sea sampling hauls, and domestic harvesting/processing capacity are updated in the Affected Environment (Section 5.0) of this document.

6. *Consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions ...*

The proposed action does not alter any adjustments made in the Monkfish and Spiny Dogfish FMPs that address opportunities for vessels that would otherwise be prevented from harvesting because of weather or other ocean conditions affecting safety aboard fishing vessels. Therefore, consultation with the U.S. Coast Guard was not required relative to this issue. The safety of fishing vessels and life at sea is a high priority issue for the Councils and was considered throughout the development of the management measures proposed in this action.

7. *Describe and identify essential fish habitat for the fishery ...*

Section 5.4 contains the description of monkfish and spiny dogfish essential fish habitat, and Section 6.4 contains the analysis of impacts of the preferred alternatives and other alternatives on EFH.

8. *In the case of a fishery management plan that, after January 1, 1991, is submitted to the Secretary for review under section 304(a) assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan;*

Monkfish and spiny dogfish stock assessments are typically conducted by the NEFSC every three years including a discussion of research needs in the fisheries, along with a SAFE Report prepared by the NEFMC and MAFMC. As an example, such needs are documented in the Monkfish 2022 operational assessment (2022). Section 5.0 of this document serves as the most recent SAFE Report developed for the monkfish and spiny dogfish fisheries.

9. *Include a fishery impact statement for the plan or amendment ...*

Any additional impacts from measures proposed in this action are evaluated in Section 6.0 of this document.

10. *Specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished ...*

The status determination criteria for monkfish and spiny dogfish were established in the Monkfish and Spiny Dogfish FMPs. Monkfish stock status is unknown based on the latest assessment in Monkfish Framework 13 and spiny dogfish is neither overfished nor experiencing overfishing based on the 2023 management track assessment (See Section 5.1).

11. *Establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery ...*

In 2015, NMFS approved a Standardized Bycatch Reporting Methodology (SBRM) amendment submitted by the Councils. NMFS led the development of an omnibus amendment to establish

provisions for industry-funded monitoring across all New England and Mid-Atlantic Council-managed FMPs. The amendment's final measures were published in April 2018 and are effective.

12. *Assess the type and amount of fish caught and released alive during recreational fishing under catch and release fishery management programs and the mortality of such fish ...*

The Monkfish FMP does not include a catch and release recreational fishery management program, because there is no recreational fishery for monkfish. The spiny dogfish fishery is primarily commercial. There are no size limits that would lead to regulatory recreational discarding. There are no specific catch and release fishery management programs.

13. *Include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery ...*

This document updates this information as appropriate in Section 6.

14. *To the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery.*

As noted under the discussion of NS 4, while conservation measures may have a differential impact on different sectors of the industry, that differential impact is not the purpose of the regulations and is done in a manner that is intended to achieve the conservation and management goals of the Monkfish and Spiny Dogfish FMPs.

15. *Establish a mechanism for specifying annual catch limits (ACL) in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability.*

The Monkfish and Spiny Dogfish FMPs include a multi-year specifications process for the monkfish and spiny dogfish fisheries that comply with the ACL/AM provisions of the MSA. Future Council actions for the Monkfish and Spiny Dogfish FMPs will continue to address the mechanism for specifying ACLs and the need to ensure accountability in the fishery. The Proposed Action would not change the mechanism for establishing ACLs.

7.2 NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) provides a mechanism for identifying and evaluating the full spectrum of environmental issues associated with federal actions and for considering a reasonable range of alternatives to avoid or minimize adverse environmental impacts. The Council on Environmental Quality has issued regulations specifying the requirements for NEPA documents (40 CFR 1500 – 1508), as has NOAA in its policy and procedures for NEPA (NAO 216-6A).

This EA is being prepared using the 2020 CEQ NEPA Regulations as modified by the Phase I 2022 revisions. The effective date of the 2022 revisions was May 20, 2022 and reviews begun after this date are required to apply the 2020 regulations as modified by the Phase I revisions unless there is a clear and fundamental conflict with an applicable statute. This EA began on May 15, 2024 and accordingly proceeds under the 2020 regulations as modified by the Phase I revisions; this start date also precedes the Phase 2 NEPA regulations (effective July 1, 2024).

7.2.1 Environmental Assessment

The required elements of an Environmental Assessment (EA) are specified in 40 CFR 1508.9(b). They are included in this document as follows:

The need for this action is in Section 3.2
The alternatives that were considered are in Section 4.0;
The environmental impacts of the proposed action are in Section 6.0;
The agencies and persons consulted on this action are in Sections 7.2.3.

While not required for the preparation of an EA, this document includes the following additional sections that are based on requirements for an Environmental Impact Statement (EIS).

An executive summary is in Section 1.0;
A table of contents is in Section 2.0;
Background and purpose are in Section 3.0;
A brief description of the affected environment is in Section 5.0;
Cumulative impacts of the proposed action are in Section 6.7;
A list of preparers is in Section 7.2.4.

7.2.2 Point of Contact

Questions concerning this document may be addressed to:

Dr. Cate O’Keefe, Executive Director
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950 (978) 465-0492

Dr. Chris Moore, Executive Director
Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901 (302) 526-5255

7.2.3 Agencies Consulted

The following agencies, in alphabetical order, were consulted in preparing this document:

Atlantic States Marine Fisheries Commission
Mid-Atlantic Fishery Management Council
New England Fishery Management Council
National Marine Fisheries Service, NOAA, Department of Commerce
United States Coast Guard, Department of Homeland Security

7.2.4 List of Preparers

The following personnel participated in preparing this document:

New England Fishery Management Council. Jenny Couture (Monkfish Plan Coordinator), Robin Frede, Cate O’Keefe
Mid-Atlantic Fishery Management Council. Karson Cisneros, Jason Didden (Dogfish Plan Coordinator), Chris Moore
National Marine Fisheries Service. Sharon Benjamin, Jason Boucher, Cynthia Ferrio, Daniel Hocking, Lynn Lankshear, Ashleigh McCord, Laura Solinger, Bridget St. Amand, Spencer Talmage
Atlantic States Marine Fisheries Commission. James Boyle

7.2.5 Opportunity for Public Comment

This action was developed from 2023-2024, and there were approximately 20 public meetings related to this action (Table 50). Opportunities for public comment occurred at Advisory Panel, Committee, and Council meetings. There were more limited opportunities to comment at PDT meetings. Meeting discussion documents and summaries are available at www.nefmc.org and www.mafmc.org.

Table 50. Public meetings related to Monkfish Framework 15 and Spiny Dogfish Framework 6.

Date	Meeting Type	Location
4/18/2023	NEFMC	Mystic, CT & webinar
4/21/2023	Sturgeon Bycatch FMAT/PDT	Webinar
5/16/2023	Joint Monkfish and Dogfish Advisory Panel	Webinar
5/17/2023	Joint Monkfish and Dogfish Committee	Webinar
6/7/2023	MAFMC	Virginia Beach, VA & webinar
6/28/2023	NEFMC	Freeport, ME & webinar
8/28/2023	Monkfish PDT Meeting	Webinar
9/20/2023	Joint Monkfish and Dogfish Committee with enforcement representatives	Webinar
9/28/2023	NEFMC	Plymouth, MA & webinar
10/3/2023	MAFMC	NYC, NY & webinar
12/11/2023	Sturgeon Bycatch FMAT/PDT	Webinar
12/14/2023	MAFMC	Annapolis, MD & webinar
12/20/2024	Sturgeon Bycatch FMAT/PDT	Webinar
2/1/2024	NEFMC	Portsmouth, NH & webinar
2/7/2024	MAFMC	Arlington, VA & webinar
2/22/2024	Sturgeon Bycatch FMAT/PDT	Webinar
3/5/2024	Joint Monkfish and Dogfish Advisory Panels	Webinar
3/13/2024	Joint Monkfish and Dogfish Committee	Webinar
4/10/2024	MAFMC	Atlantic City, NJ & webinar
4/17/2024	NEFMC	Mystic, CT & webinar

7.3 MARINE MAMMAL PROTECTION ACT (MMPA)

The various species of marine mammals occurring in the management unit of both the monkfish and spiny dogfish FMPs that are afforded protection under the Marine Mammal Protection Act of 1972 (MMPA) are described in Section 5.3. Section 6.4 contains an assessment of the impacts of the proposed action on marine mammal species identified in Section 5.3. As provided in Section 6.4, various MMPA protected species have the potential to interact with the gear types used in the monkfish and spiny dogfish FMPs. None of the proposed measures are expected to significantly alter fishing methods or activities or substantially change effort relative to current operating conditions in the fishery. The New England and Mid-Atlantic Fishery Management Councils have reviewed the impacts of the proposed management measures to reduce sturgeon bycatch in the commercial monkfish and spiny dogfish fisheries on marine mammals and have concluded that the

management actions proposed are consistent with the provisions of the MMPA and would not alter existing measures (e.g., take reduction plans) to protect the species likely to occur in management unit of these FMPs. A final determination of consistency with the MMPA will be made by the agency when this action is approved.

7.4 ENDANGERED SPECIES ACT (ESA)

Pursuant to section 7 of the Endangered Species Act (ESA), NOAA's National Marine Fisheries Service (NMFS) issued a Biological Opinion (Opinion) on May 27, 2021, that considered the effects of the NMFS' authorization of ten fishery management plans (FMP), NMFS' North Atlantic Right Whale Conservation Framework, and the New England Fishery Management Council's Omnibus Essential Fish Habitat Amendment 2, on ESA-listed species and designated critical habitat. The ten FMPs considered in the Opinion include the: (1) American Lobster; (2) Atlantic Bluefish; (3) Atlantic Deep-Sea Red Crab; (4) Mackerel/Squid/Butterfish; (5) Monkfish; (6) Northeast Multispecies; (7) Northeast Skate Complex; (8) Spiny Dogfish; (9) Summer Flounder/Scup/Black Sea Bass; and (10) Jonah Crab FMPs. The American Lobster and Jonah Crab FMPs are permitted and operated through implementing regulations compatible with the interstate fishery management plans (ISFMP) issued under the authority of the Atlantic Coastal Fisheries Cooperative Management Act (ACA), the other eight FMPs are issued under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

The 2021 Opinion determined that the NMFS' authorization of ten FMPs, NMFS' North Atlantic Right Whale Conservation Framework, and the New England Fishery Management Council's Omnibus Essential Fish Habitat Amendment 2: 1) may adversely affect, but is not likely to jeopardize, the continued existence of North Atlantic right, fin, sei, or sperm whales; the Northwest Atlantic Ocean distinct population segment (DPS) of loggerhead, leatherback, Kemp's ridley, or North Atlantic DPS of green sea turtles; any of the five DPSs of Atlantic sturgeon; Gulf of Maine DPS Atlantic salmon; or giant manta rays; and, 2) is not likely to adversely affect designated critical habitat for North Atlantic right whales, the Northwest Atlantic Ocean DPS of loggerhead sea turtles, U.S. DPS of small tooth sawfish, Johnson's seagrass, or elkhorn and staghorn corals. An Incidental Take Statement (ITS) was issued in the Opinion. The ITS includes reasonable and prudent measures and their implementing terms and conditions, which NMFS determined are necessary or appropriate to minimize impacts of the incidental take in the fisheries assessed in this Opinion.

Given the information provided above, it has been determined that the proposed action is within the scope of the FMPs considered in the 2021 Opinion and will not create impacts to ESA-listed species or critical habitat that go above and beyond those considered in the 2021 Opinion completed by NMFS.

7.5 ADMINISTRATIVE PROCEDURE ACT (APA)

Sections 551-553 of the Administrative Procedure Act established procedural requirements applicable to informal rulemaking by federal agencies. The purpose is to ensure public access to the federal rulemaking process, and to give public notice and opportunity for comment. The Councils did not request relief from notice and comment rule making for this action and expects that NOAA Fisheries will publish proposed and final rule making for this action.

7.6 PAPERWORK REDUCTION ACT

The purpose of the Paperwork Reduction Act is to minimize paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. It also ensures that the Government is not overly burdening the public with information requests. This action does not include any revisions to the current PRA collection requirements; therefore, no review under the Paperwork Reduction Act is necessary.

7.7 COASTAL ZONE MANAGEMENT ACT (CZMA)

Section 307 of the Coastal Zone Management Act (CZMA) is known as the federal consistency provision. Federal Consistency review requires that “federal actions, occurring inside or outside of a state's coastal zone, that have a reasonable potential to affect the coastal resources or uses of that state's coastal zone, to be consistent with that state's enforceable coastal policies, to the maximum extent practicable.” The Councils previously made determinations that the Monkfish and Spiny Dogfish FMPs were consistent with each state’s coastal zone management plan and policies, and each coastal state concurred in these consistency determinations (in the Monkfish and Spiny Dogfish FMPs). Since the proposed action does not propose any substantive changes from the FMPs, the Councils have determined that this action is consistent with the coastal zone management plan and policies of the coastal states in this region. Once the Council has adopted final measures and submitted Monkfish Framework 15 and Spiny Dogfish Framework 6 to NMFS, NMFS will request consistency reviews by CZM state agencies directly.

7.8 INFORMATION QUALITY ACT (IQA)

Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-554, also known as the Data Quality Act or Information Quality Act) directed the Office of Management and Budget (OMB) to issue government-wide guidelines that “provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by federal agencies.” OMB directed each federal agency to issue its own guidelines, establish administrative mechanisms allowing affected persons to seek and obtain correction of information that does not comply with the OMB guidelines, and report periodically to OMB on the number and nature of complaints. The NOAA Section 515 Information Quality Guidelines require a series of actions for each new information product subject to the Data Quality Act. Information must meet standards of utility, integrity, and objectivity. This section provides information required to address these requirements.

Utility of Information Product

Monkfish Framework 15 and Spiny Dogfish Framework 6 and the proposed management measures to reduce sturgeon bycatch in the commercial monkfish and spiny dogfish fisheries include: a description of the management issues to be addressed, statement of goals and objectives, a description of the proposed action and other alternatives/options considered, analyses of the impacts of the proposed specifications and other alternatives/options on the affected environment, and the reasons for selecting the preferred specifications. These proposed modifications implement the FMPs’ conservation and management goals consistent with the Magnuson-Stevens Fishery Conservation and Management Act as well as all other existing applicable laws.

Utility means that disseminated information is useful to its intended users. “Useful” means that the content of the information is helpful, beneficial, or serviceable to its intended users, or that the information supports the usefulness of other disseminated information by making it more accessible or easier to read, see, understand, obtain or use. The information presented in this document is helpful to the intended users (the affected public) by presenting a clear description of the purpose and need of the proposed action, the measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the proposed action is included so that intended users may have a full understanding of the proposed action and its implications. The intended users of the information contained in this document are participants in the monkfish fishery and other interested parties and members of the general public. This information will enable these individuals to adjust their fishing practices and make appropriate business decisions based on the new management measures and corresponding regulations.

The information being provided in the proposed management measures to reduce sturgeon bycatch in the commercial monkfish and spiny dogfish fisheries concerning the status of the monkfish and spiny dogfish

fisheries is updated based on landings and effort information through the 2020, 2021, and 2022 fishing years when possible. Information presented in this document is intended to support Monkfish Framework 15 and Spiny Dogfish Framework 6 and the proposed management measures to reduce sturgeon bycatch in the commercial monkfish and spiny dogfish fisheries, which have been developed through a multi-stage process involving all interested members of the public. Consequently, the information pertaining to management measures contained in this document has been improved based on comments from the public, fishing industry, members of the Council, and NOAA Fisheries.

Until a proposed rule is prepared and published, this document is the principal means by which the information herein is publicly available. The information provided in this document is based on the most recent available information from the relevant data sources, including detailed and relatively recent information on the monkfish resource and, therefore, represents an improvement over previously available information. This document will be subject to public comment through proposed rulemaking, as required under the Administrative Procedure Act and, therefore, may be improved based on comments received.

This document is available in several formats, including printed publication, and online through the NEFMC's web page (www.nefmc.org) and the MAFMC's web page (www.mafmc.org). The *Federal Register* notice that announces the proposed rule and the final rule and implementing regulations will be made available in printed publication, on the website for the Greater Atlantic Regional Fisheries Office (www.greateratlantic.fisheries.noaa.gov), and through the Regulations.gov website. The *Federal Register* documents will provide metric conversions for all measurements.

Integrity of Information Product

Integrity refers to security – the protection of information from unauthorized access or revision, to ensure that the information is not compromised through corruption or falsification. Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NMFS adheres to the standards set out in Appendix III, “Security of Automated Information Resources,” of OMB Circular A-130; the Computer Security Act; and the Government Information Security Act. All confidential information (e.g., dealer purchase reports) is safeguarded pursuant to the Privacy Act; Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business, and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

Objectivity of Information Product

Objective information is presented in an accurate, clear, complete, and unbiased manner, and in proper context. The substance of the information is accurate, reliable, and unbiased; in the scientific, financial, or statistical context, original and supporting data are generated and the analytical results are developed using sound, commonly accepted scientific and research methods. “Accurate” means that information is within an acceptable degree of imprecision or error appropriate to the *kind* of information at issue and otherwise meets commonly accepted scientific, financial, and statistical standards.

For purposes of the Pre-Dissemination Review, this document is a “Natural Resource Plan.” Accordingly, the document adheres to the published standards of the MSA; the Operational Guidelines, Fishery Management Plan Process; the Essential Fish Habitat Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing NEPA. This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Several data sources were used in the development of this action, including, but not limited to, historical and current landings data from the Commercial Dealer database, vessel trip report (VTR) data, and fisheries independent data collected through the NMFS bottom trawl surveys. The analyses herein were

prepared using data from accepted sources and have been reviewed by members of the Monkfish and Spiny Dogfish Plan Development Teams (also known as the Sturgeon Bycatch FMAT/PDT).

Despite current data limitations, the conservation and management measures considered for this action were selected based upon the best scientific information available. The analyses important to this decision used information from the most recent years, generally through 2021 and 2022. The data used in the analyses provide the best available information on the number of permits, both active and inactive, in the fishery, the catch (including landings and discards) by those vessels, the landings per unit of effort (LPUE), and the revenue produced by the sale of those landings to dealers, as well as data about catch, bycatch, gear, and fishing effort from a subset of trips sampled at sea by government observers.

Specialists, including professional members of PDTs, FMATs, technical teams, committees, and Council staff, who worked with these data are familiar with current analytical techniques and with the available data and information relevant to the monkfish and spiny dogfish fisheries. The proposed action is supported by the best available scientific information. The policy choice is clearly articulated in Section 0, the management alternatives considered in this action.

The supporting science and analyses, upon which the policy choice was based, are summarized and described in the SAFE Report for Fishing Years 2023-2025 (Monkfish Framework 13) and the 2023 Spiny Dogfish Specifications Environmental Assessment, Section 5.0 of this document. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency. The review process used in preparation of this document involves the responsible Council, the NEFSC, GARFO, and NOAA Fisheries Service Headquarters. The NEFSC's technical review is conducted by senior-level scientists specializing in population dynamics, stock assessment, population biology, and social science.

The Council review process involves public meetings at which affected stakeholders have opportunities to comment on the document. Review by staff at GARFO is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. The Council also uses its SSC to review the background science and assessment to approve the Overfishing Limits (OFLs) and Allocable Biological Catch (ABCs), including the effects those limits would have on other specifications in this document. The SSC is the primary scientific and technical advisory body to the Council and is made up of scientists that are independent of the Council.

Final approval of the action proposed in this document and clearance of any rules prepared to implement resulting regulations is conducted by staff at NOAA Fisheries Service Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget. In preparing this action for the Monkfish FMP and the Spiny Dogfish FMP, NMFS, the Administrative Procedure Act, the Paperwork Reduction Act, the Coastal Zone Management Act, the Endangered Species Act, the Marine Mammal Protection Act, the Information Quality Act, and Executive Orders 12630 (Property Rights), 12866 (Regulatory Planning), 13132 (Federalism), and 13158 (Marine Protected Areas). The Council has determined that the proposed action is consistent with the National Standards of the MSA and all other applicable laws.

7.9 EXECUTIVE ORDER 13158 (MARINE PROTECTED AREAS)

Executive Order (EO) 13158 on Marine Protected Areas (MPAs) requires each federal agency whose actions affect the natural or cultural resources that are protected by an MPA to identify such actions, and, to the extent permitted by law and to the maximum extent practicable, in taking such actions, avoid harm to the natural and cultural resources that are protected by an MPA. The EO directs federal agencies to refer to the MPAs identified in a list of MPAs that meet the definition of MPA for the purposes of the EO. The EO requires that the Departments of Commerce and the Interior jointly publish and maintain such a list of MPAs.

A list of MPA sites has been developed and is available at:

<http://marineprotectedareas.noaa.gov/nationalsystem/nationalsystemlist/>. No further guidance related to this EO is available at this time.

In the Northeast U.S., the only MPAs are the Stellwagen Bank National Marine Sanctuary (SBNMS), the Tilefish Gear Restricted Areas in the canyons of Georges Bank, and the National Estuarine Research Reserves and other coastal sites. The only MPA that overlaps the monkfish and spiny dogfish fisheries' footprint is the SBNMS.

This action is not expected to more than minimally affect the biological/habitat resources of the SBNMS MPA, which was comprehensively analyzed in the Omnibus Habitat Amendment 2 (NEFMC 2016). Fishing gears regulated by the Monkfish and Spiny Dogfish FMPs are unlikely to damage shipwrecks and other cultural artifacts because fishing vessel operators avoid contact with cultural resources on the seafloor to minimize costly gear losses and interruptions to fishing.

7.10 EXECUTIVE ORDER 13132 (FEDERALISM)

Executive Order 13132 on federalism established nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. However, no federalism issues or implications have been identified relative to the measures proposed in this action, thus preparation of an assessment under EO 13132 is unwarranted. The affected states have been closely involved in the development of the proposed action through their representation on the Councils. All affected states are represented as voting members of at least one Regional Fishery Management Council. No comments were received from any state officials relative to any federalism implications that may be associated with this action.

7.11 EXECUTIVE ORDER 12898 (ENVIRONMENTAL JUSTICE)

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations provides guidelines to ensure that potential impacts on these populations are identified and mitigated, and that these populations can participate effectively in the NEPA process (EO 12898 1994). NOAA guidance NAO 216-6A, Companion Manual, Section 10(A) requires the consideration of EO 12898 in NEPA documents. Agencies should also encourage public participation, especially by affected communities, during scoping, as part of a broader strategy to address environmental justice issues. Minority and low-income individuals or populations must not be excluded from participation in, denied the benefits of, or subjected to discrimination because of their race, color, or national origin.

Environmental justice is measured at the community level. Here, community is defined as a fishing community. Indicators of vulnerability for purposes of environmental justice can include but are not limited to income, race/ethnicity, household structure, education levels, and age. The NOAA Fisheries [Community Social Indicators](#), especially the poverty, population composition, and personal disruption indices (Table 39) can help identify the communities where environmental justice may be of concern. Primary and secondary monkfish ports that ranked medium-high to high for at least one of these indices are: Boston and New Bedford, Massachusetts; New London, Connecticut; Hampton Bays/Shinnecock, New York; and Newport News, Virginia. Most recent spiny dogfish landings are in Massachusetts (especially Chatham, Plymouth, and Scituate), Virginia, and New Jersey. These communities may be more vulnerable to changes in federal actions, due to factors described above as important indicators for environmental justice.

Although the impacts of the proposed action may affect communities with environmental justice concerns, the proposed actions should not have disproportionately high effects on low income or minority populations. The proposed actions would apply to all participants in the affected area, regardless of minority status or income level. There is insufficient demographic data on participants in the monkfish and spiny dogfish

fisheries (i.e., vessel owners, crew, dealers, processors, employees of supporting industries) to quantify the income and minority status of potentially affected fishery participants. However, it is qualitatively known that people of racial or ethnic minorities constitute a substantial portion of the employees in the seafood processing sector, particularly in communities such as New Bedford. Without more data, it is difficult to fully determine how this action may impact various population segments. The public comment process is an opportunity to identify issues that may be related to environmental justice, but none have been raised relative to this action. The public has never requested translations of documents pertinent to the monkfish and spiny dogfish fisheries.

Regarding subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence.

7.12 REGULATORY FLEXIBILITY ACT (RFAI)

The purpose of the Regulatory Flexibility Analysis (RFA) is to reduce the impacts of burdensome regulations and record-keeping requirements on small businesses. To achieve this goal, the RFA requires government agencies to describe and analyze the effects of regulations and possible alternatives on small business entities. Based on this information, the Regulatory Flexibility Analysis determines whether the preferred alternative would have a “significant economic impact on a substantial number of small entities.”

For RFA purposes only, NMFS has established a small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing (see 50 CFR § 200.2). A business primarily engaged in commercial fishing (NAICS code 11411) is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of \$11 million for all its affiliated operations worldwide. The determination as to whether the entity is large or small is based on the average annual revenue for the five years from 2018 through 2022. There are no effects on for-hire fishing operations, which have a different threshold (\$8.0 million).

This document provides the factual basis supporting a certification that the proposed regulations will not have a “significant impact on a substantial number of small entities” and that an IRFA is not needed in this case. Certifying an action must include the following elements, and each element is subsequently elaborated upon below:

- A. A statement of basis and purpose of the rule
- B. A description and estimate of the number of small entities to which the rule applies
- C. Description and estimate of economic impacts on small entities, by entity size and industry
- D. An explanation of the criteria used to evaluate whether the rule would impose significant economic impacts
- E. An explanation of the criteria used to evaluate whether the rule would impose impacts on a substantial number of small entities
- F. A description of, and an explanation of the basis for, assumptions used.

A. Basis and purpose of the rule

The basis of the rules proposed in this action are the provisions of the MSA for federal fishery management. This action is needed to effectively manage the monkfish and spiny dogfish fisheries. The purpose and need for this action are further detailed in Section 3, while a full description of all alternatives is provided in Section 4. To assist with further evaluation of the measures proposed in

this document, the following is a brief summary of the preferred alternative selected by the Council for this action: year-round low-profile gillnet gear requirement in the NJ bycatch hotspot polygon in the monkfish fishery; overnight soak prohibition from 8pm until 5am in the New Jersey bycatch hotspot polygon during the months of May and November for the spiny dogfish fishery; overnight soak prohibition from 8pm until 5am in the Delaware/Maryland/Virginia bycatch hotspot polygons from November 1 through March 31 for the spiny dogfish fishery for vessels using mesh $\geq 5.25''$ mesh (there would be exemption for vessels using $< 5.25''$ mesh that would be permitted to do overnight soaks).

B. Description and estimate of the number of small entities to which the rule applies

The measures proposed in this action apply to vessels that hold commercial federal permits for spiny dogfish and/or monkfish. Some small entities own multiple vessels with relevant permits. Staff queried ownership data provided by the Social Science Branch of NMFS' Northeast Fisheries Science Center to estimate the number of relevant small entities.

The analysis found that in 2022, there were 1,899 vessels with federal commercial spiny dogfish or monkfish permits. These permits were owned by 1,406 ownership entities. Of those, 197 were primarily for-hire operations, leaving 1,209 as either commercial entities or entities with no 2022 revenue to make such a determination, so are considered as potentially-affected commercial entities. Of those, 11 were deemed large entities, leaving 1,198 potentially affected commercial small entities. No for-hire measures are considered in this action.

C. Description and estimate of economic impacts on small entities

Monkfish: In 2021, ownership data collected from permit holders indicate there are 1,207 distinct business entities that held at least one permit that could be directly regulated by this proposed action in 2024. Of these 1,207 entities, 804 are commercial fishing entities, and 137 are for-hire entities. Of the 804 commercial fishing entities, 793 are categorized as small entities and 11 are categorized as large entities, per the NOAA Fisheries guidelines. All 137 for-hire entities are categorized as small businesses. In 2021, 266 of the 1,207 entities had zero monkfish revenue.

90-108 federally-permitted vessels landed over 10,000 pounds of monkfish (measured in landed pounds) in the 2020-2022 fishing years, with total monkfish landings ex-vessel revenues averaging \$10.7 million (range \$8.6-\$12.2 million). For an individual vessel or dealer/processor however, monkfish may be a crucial part of their annual operations. As described in Section 5.5, skates, groundfish, and other fish make up a substantial portion of revenues on trips using Monkfish DAS (39% in the 2021 fishing year), so the ability to target monkfish also likely facilitates these other revenues as well. If monkfish trips are disrupted, there will likely be additional revenue losses tied to the other fish that are often retained on monkfish trips. Appendix D describes average 2020-2022 monthly monkfish landings and revenues generally and specific to the areas potentially affected by the sturgeon management measures, which will help contextualize the impacts of the alternatives.

Alternatives 2 through 4 would require the use of a selective gillnet configuration, called a low profile net, within an area off the coast of New Jersey. Delayed implementation of these types of measures would provide affected entities the opportunity to prepare for the requirement, principally by purchasing nets that fit the specifications of the new design or by purchasing the materials necessary to build new nets. The cost of a 300 foot low-profile net panel is estimated to be \$435; total costs per vessel will vary depending on the number of nets being replaced. Framework Adjustment 13 to the Monkfish Fishery Management Plan (August 11, 2023, 88 FR 54495) estimated the range in the number of nets per vessel that might be replaced as a result of mesh size changes implemented by that action. Using that range, it was estimated that per vessel cost to replace nets would range from \$5,655 to \$42,630. From 2018 through 2022, there were 22 vessels fishing out of ports in New Jersey that landed at least \$1,000 dollars of monkfish. Applying the per vessel costs to a fleet of 22 vessels results in a total fishery cost of \$124,410 to \$937,860. However, this

figure is likely an overestimate; the count of 22 vessels included all ports in New Jersey, some of which will not be in the geographic footprint of the New Jersey bycatch hotspot polygon. Additionally, some vessels currently fishing within the footprint of the New Jersey bycatch hotspot polygon will choose to relocate their effort once restrictions are in place. Finally, for some, but not all, entities, the timing of the effectiveness of this rule will align with the end of the lifecycle of nets currently in use, so the costs to acquire the new nets would have been incurred regardless of this action for those entities. As a result, these short-term costs are expected to be minor for the purposes of RFA.

The gear research that informed the development of these alternatives indicated no significant difference in monkfish catch rates off New Jersey with the proposed low-profile gear. As a result, it is not expected that this action would constrain the operations of the directed monkfish fishery compared to recent performance. Both small and large entities are likely to be impacted equivalently under the proposed framework action.

Spiny dogfish: Given the preferred alternative should only minimally constrain the fishery compared to recent performance, only minimal impacts are expected. 9-87 federally-permitted vessels landed over 10,000 pounds of spiny dogfish (measured in live pounds) in the 2020-2022 fishing years, with total spiny dogfish landings ex-vessel revenues averaging \$2.5 million (range \$2.3-\$2.7 million). For an individual vessel or dealer/processor however, spiny dogfish may be a crucial part of their annual operations. Appendix D describes average 2020-2022 monthly spiny dogfish landings and revenues generally and specific to the areas potentially affected by the sturgeon management measures, which will help contextualize the impacts of the alternatives.

D. & E. An explanation of the criteria used to evaluate whether the rule would impose significant economic impacts / An explanation of the criteria used to evaluate whether the rule would impose impacts on a substantial number of small entities

The criteria used to evaluate whether the rule would impose significant economic impacts was whether the landings (and therefore ex-vessel revenues) from the preferred alternatives would be constraining beyond recent landings history, and the relative importance of potential lost revenues for the entities and/or vessels owned by those entities. As described above in “C,” the impacts do not appear significant from an RFA perspective.

F. A description of, and an explanation of the basis for, assumptions

Other than those described directly in the above analyses, the primary assumption utilized in the above analyses is that comparing upcoming fishery operation to how the fishery operated over 2019-2021 is appropriate. Using the most recent three years of fishery operation is standard practice for Regulatory Flexibility Analysis and there is no indication that such an approach is contraindicated in this case since doing so captures what the industry has recently experienced versus potential impacts going forward from implementation of the proposed specifications.

7.13 EXECUTIVE ORDER 12866 (REGULATORY PLANNING AND REVIEW)

The purpose of Executive Order 12866 (E.O. 12866, 58 FR 51735, October 4, 1993) is to enhance planning and coordination with respect to new and existing regulations. This E.O. requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be “significant.” E.O. 12866 requires a review of proposed regulations to determine if the expected effects would be significant, where a significant action is any regulatory action that may:

- Have an annual effect on the economy of \$200 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set for the Executive Order.

In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. The proposed action will reduce sturgeon bycatch in the commercial monkfish and spiny dogfish fisheries.

Changes in consumer surplus are not projected from this proposed rule. Changes in vessel profits and crew earnings from changes in the monkfish and spiny dogfish quotas and revenues earned from other species while on monkfish and spiny dogfish trips are quantified and used as a proxy for producer surplus measures. Since crew are typically paid a share of the revenue from a fishing trip, but also pay the trip costs, their earnings are broken out separately from the vessel earnings.

7.13.1 Statement of the Problem/Goals and Objectives

Problem, goals, and objectives are explained in Section 3.0.

7.13.2 Management Alternative and Rationale

The alternatives under consideration in this Framework are explained in Section 4.0.

7.13.3 Description of the Fishery and other Affected Entities

A description of the monkfish and spiny dogfish fisheries is available in Section 5.5.

7.13.4 Summary of Impacts

A detailed description of the impacts of the alternatives can be found in Section 6.0.

7.13.5 Economic Impacts Relative to the Baseline

The proposed action is only focused on gear modifications: requirement to use low-profile gillnet gear year-round in the monkfish fishery in the NJ bycatch hotspot polygon and a prohibition of overnight soaks in the NJ and DE/MD/VA bycatch hotspot polygons in the spiny dogfish fishery (with the exception of vessels using mesh <5.25" in the DE/MD/VA bycatch hotspot polygon). Monkfish and spiny dogfish landings are expected to remain similar to prior levels. There is no way to estimate changes in economic value from these gear modification requirements. It is expected that fishermen will gain a slightly less economic gain from these new gear modification requirements given the added cost of low-profile gear in the monkfish fishery and the potential loss of spiny dogfish landings from overnight soak prohibition, though this would be minimized as fishermen adapt to the measure (and do day-soak fishing), and or/shift to other areas, and/or use smaller mesh.

7.13.6 Summary of EO 12866 findings

Given there is currently no model which predicts changes in how fishing vessels fish given the combination of the management measures chosen for the Framework action, it is not possible to fully assess the benefits and costs of this action in an integrated way. To gauge whether the threshold of a \$100 million annual effect on the economy is breached, we can only add up the individual changes in each measure and see if the sum approaches \$100 million.

As stated above, the requirement to use low-profile gillnet gear year-round in the NJ bycatch hotspot polygon in the monkfish fishery and the overnight soak prohibition in the NJ and DE/MD/VA bycatch hotspot polygons in the spiny dogfish fishery (with the exception of vessels using mesh <5.25”) is not expected to change fishing effort in a substantial way. Monkfish and spiny dogfish landings are expected to remain similar to prior levels. There is no way to estimate changes in economic value from these gear modification requirements. It is expected that fishermen will gain a slightly less economic gain from these new gear modification requirements given the added cost of low-profile gear in the monkfish fishery and the potential loss of spiny dogfish landings from overnight soak prohibition, though this would be minimized as fishermen adapt to the measure (and do day-soak fishing), and or/shift to other areas, or use smaller mesh.

7.13.7 Determination of Significance

The proposed action does not constitute a significant regulatory action under EO 12866 for the following reasons: the proposed action will not have an annual effect on the economy of more than \$100 million.

Adverse impacts on fisherman and fishing businesses, ports, recreational anglers, and operators of party/charter businesses are expected to be quite small.

In addition, there should be no interactions with activities of other agencies and no impacts on entitlements, grants, user fees, or loan programs. The proposed action does not raise novel legal or policy issues. As such, the Proposed Action is not considered significant as defined by EO 12866.

8.0 GLOSSARY

Acceptable Biological Catch (ABC) – A level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL.

Annual Catch Limit (ACL) – The level of annual catch of a stock or stock complex that serves as the basis for invoking accountability measures (AMs).

Annual Catch Target (ACT) – An amount of annual catch of a stock or stock complex that is the management target of the fishery.

Adult stage – One of several marked phases or periods in the development and growth of many animals. In vertebrates, the life history stage where the animal is capable of reproducing, as opposed to the juvenile stage.

Adverse effect – Any impact that reduces quality and/or quantity of EFH. May include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include sites-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions.

Aggregation – A group of animals or plants occurring together in a particular location or region.

Accountability Measure (AM) – A management control that prevents ACLs from being exceeded, where possible, and correct or mitigate overages if they occur.

Amendment – a formal change to a fishery management plan (FMP). The Council prepares amendments and submits them to the Secretary of Commerce for review and approval. The Council may also change FMPs through a "framework adjustment procedure".

Availability – refers to the distribution of fish of different ages or sizes relative to that taken in the fishery.

Benthic community – Benthic means the bottom habitat of the ocean and can mean anything as shallow as a salt marsh or the intertidal zone, to areas of the bottom that are several miles deep in the ocean. Benthic community refers to those organisms that live in and on the bottom.

Biological Reference Points – specific values for the variables that describe the state of a fishery system which are used to evaluate its status. Reference points are most often specified in terms of fishing mortality rate and/or spawning stock biomass.

Biomass – The total mass of living matter in a unit area or the weight of a fish stock or portion thereof. Biomass can be listed for beginning of year (Jan 1), Mid-Year, or mean (average during the entire year). Also, biomass can be listed by age group (numbers at age * average weight at age) or summarized by groupings (e.g., age 1+, ages 4+ 5, etc.). See also spawning stock biomass, exploitable biomass, and mean biomass.

Biota – All the plant and animal life of a region.

Bivalve – A class of mollusks having a soft body with platelike gills enclosed within two shells hinged together, e.g., clams, mussels.

Bottom tending mobile gear – All fishing gear that operates on or near the ocean bottom that is actively worked to capture fish or other marine species. Some examples of bottom tending mobile gear are otter trawls and dredges.

Bottom tending static gear – All fishing gear that operates on or near the ocean bottom that is not actively worked; instead, the effectiveness of this gear depends on species moving to the gear which is set in a

particular manner by a vessel, and later retrieved. Some examples of bottom tending static gear are gillnets, traps, and pots.

B_{MSY} – the stock biomass that would produce maximum sustainable yield (MSY) when fished at a level equal to F_{MSY}. For most stocks, B_{MSY} is about ½ of the carrying capacity.

B_{target} – A desirable biomass to maintain fishery stocks. This is usually synonymous with B_{MSY} or its proxy and was set in the original Monkfish FMP as the median of the 3-yr. running average of the 1965-1981 autumn trawl survey biomass index.

B_{threshold} – 1) A limit reference point for biomass that defines an unacceptably low biomass i.e., puts a stock at high risk (recruitment failure, depensation, collapse, reduced long term yields, etc.). 2) A biomass threshold that the SFA requires for defining when a stock is overfished. A stock is overfished if its biomass is below B_{threshold}. A determination of overfished triggers the SFA requirement for a rebuilding plan to achieve B_{target} as soon as possible, usually not to exceed 10 years except certain requirements are met. For monkfish, B_{threshold} was specified in Framework 2 as 1/2B_{Target} (see below).

Bycatch – (v.) the capture of nontarget species in directed fisheries which occurs because fishing gear and methods are not selective enough to catch only target species; (n.) fish which are harvested in a fishery but are not sold or kept for personal use, including economic discards and regulatory discards but not fish released alive under a recreational catch and release fishery management program.

Capacity – the level of output a fishing fleet can produce given specified conditions and constraints. Maximum fishing capacity results when all fishing capital is applied over the maximum amount of available (or permitted) fishing time, if all variable inputs are utilized efficiently.

Catch – The total of fish killed in a fishery in a period. Catch is given in either weight or number of fish and may include landings, unreported landings, discards, and incidental deaths.

Coarse sediment – Sediment generally of the sand and gravel classes; not sediment composed primarily of mud; but the meaning depends on the context, e.g., within the mud class, silt is coarser than clay.

Continental shelf waters – The waters overlying the continental shelf, which extends seaward from the shoreline and deepens gradually to the point where the sea floor begins a slightly steeper descent to the deep ocean floor; the depth of the shelf edge varies but is about 200 meters in many regions.

CPUE – Catch per unit effort. This measure includes landings and discards (live and dead), often expressed per hour of fishing time, per day fished, or per day-at-sea.

DAS (day-at-sea) – A day-at-sea is an allocation of time that a vessel may be at-sea on a fishing trip. For vessels with VMS equipment, it is the cumulative time that a vessel is seaward of the VMS demarcation line. For vessels without VMS equipment, it is the cumulative time between when a fisherman calls in to leave port to the time that the fisherman calls in to report that the vessel has returned to port.

Demersal species – Most often refers to fish that live on or near the ocean bottom. They are often called benthic fish, groundfish, or bottom fish.

Discards – animals returned to sea after being caught; see Bycatch (n.)

Environmental Impact Statement (EIS) – an analysis of the expected impacts of a fishery management plan (or some other proposed federal action) on the environment and on people, initially prepared as a "Draft" (DEIS) for public comment. The Final EIS is referred to as the Final Environmental Impact Statement (FEIS).

Essential Fish Habitat (EFH) – Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment 2 (NEFMC 2016).

Exclusive Economic Zone (EEZ) – for the purposes of the Magnuson-Stevens Fishery Conservation and Management Act, the area from the seaward boundary of each of the coastal states to 200 nautical miles from the baseline.

Exempted fisheries – Any fishery determined by the Regional Director to have less than 5 percent regulated species as a bycatch (by weight) of total catch according to 50 CFR 648.80(a)(7).

Exploitation Rate – the percentage of catchable fish killed by fishing every year. If a fish stock has 1,000,000 fish large enough to be caught by fishing gear and 550,000 are killed by fishing during the year, the annual exploitation rate is 55%.

Fathom – A measure of length, containing six feet; the space to which a man can extend his arms; used chiefly in measuring cables, cordage, and the depth of navigable water by soundings.

Fishing effort – the amount of time and fishing power used to harvest fish. Fishing power is a function of gear size, boat size and horsepower.

Fishing Mortality (F) – (see also exploitation rate) a measurement of the rate of removal of fish from a population by fishing. F is that rate at which fish are harvested at any given point in time. ("Exploitation rate" is an annual rate of removal, "F" is an instantaneous rate.)

F_{0.1} – F at which the increase in yield-per-recruit in weight for an increase in a unit-of effort is only 10% of that produced in an unexploited stock; usually considered a conservative target fishing mortality rate.

F_{MSY} – a fishing mortality rate that would produce the maximum sustainable yield from a stock when the stock biomass is at a level capable of producing MSY on a continuing basis.

F_{MAX} – the fishing mortality rate that produces the maximum level of yield per recruit. This is the point beyond which growth overfishing begins.

F_{target} – the fishing mortality that management measures are designed to achieve.

F_{threshold} – 1) The maximum fishing mortality rate allowed on a stock and used to define overfishing for status determination. 2) The maximum fishing mortality rate allowed for a given biomass as defined by a control rule.

FMP (Fishery Management Plan) – a document that describes a fishery and establishes measures to manage it. This document forms the basis for federal regulations for fisheries managed under the Regional Fishery Management Councils. The New England Fishery Management Council prepares FMPs and submits them to the Secretary of Commerce for approval and implementation.

Framework adjustments: adjustments within a range of measures previously specified in a fishery management plan (FMP). A change usually can be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the New England Council, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

Individual Fishing Quota (IFQ) – A Federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by an individual person or entity

Landings – The portion of the catch that is harvested for personal use or sold.

Larvae (or Larval) stage – One of several marked phases or periods in the development and growth of many animals. The first stage of development after hatching from the egg for many fish and invertebrates. This life stage looks fundamentally different than the juvenile and adult stages and is incapable of reproduction; it must undergo metamorphosis into the juvenile or adult shape or form.

Limited access – a management system that limits the number of participants in a fishery. Usually, qualification for this system is based on historic participation, and the participants remain constant over time (except for attrition).

Limited-access permit – A permit issued to vessels that met certain qualification criteria by a specified date (the "control date").

LPUE – Landings per unit effort. This measure is the same as CPUE but excludes discards.

Maximum sustainable yield (MSY) – the largest average catch that can be taken from a stock under existing environmental conditions.

Mesh selectivity (ogive) – A mathematical model used to describe the selectivity of a mesh size (proportion of fish at a specific length retained by mesh) for the entire population. L25 is the length where 25% of the fish encountered are retained by the mesh. L50 is the length where 50% of the fish encountered are retained by the mesh.

Meter – A measure of length, equal to 39.37 English inches, the standard of linear measure in the metric system of weights and measures. It was intended to be, and is very nearly, the ten millionth part of the distance from the equator to the north pole, as ascertained by actual measurement of an arc of a meridian.

Metric ton (mt) – A unit of weight equal to 1,000 kilograms (1kg = 2.2 lb). A metric ton is equivalent to 2,204.6 lb. A thousand metric tons is equivalent to 2.204M lb.

Minimum biomass level – the minimum stock size (or biomass) below which there is a significantly lower chance that the stock will produce enough new fish to sustain itself over the long term.

Mortality – Noun, either referring to fishing mortality (F) or total mortality (Z).

Multispecies – the group of species managed under the Northeast Multispecies Fishery Management Plan. This group includes whiting, red hake and ocean pout plus the regulated species (cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish).

Natural Mortality (M) – a measurement of the rate of fish deaths from all causes other than fishing such as predation, cannibalism, disease, starvation, and pollution; the rate of natural mortality may vary from species to species.

Northeast Shelf Ecosystem – The Northeast U.S. Shelf Ecosystem has been described as including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream.

Observer – Any person required or authorized to be carried on a vessel for conservation and management purposes by regulations or permits under this Act.

Overfishing Limit (OFL) – The annual amount of catch that corresponds to the estimate of the maximum fishing mortality threshold applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish.

Open access – Describes a fishery or permit for which there is no qualification criteria to participate. Open-access permits may be issued with restrictions on fishing (for example, the type of gear that may be used or the amount of fish that may be caught).

Optimum yield (OY) – the amount of fish which-

- (a) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems;

- (b) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and
- (c) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery.

Overfished – A condition defined when stock biomass is below minimum biomass threshold and the probability of successful spawning production is low.

Overfishing – A level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis.

PDT (Plan Development Team) – a group of technical experts responsible for developing and analyzing management measures under the direction of the Council; the Council has a Monkfish PDT that meets to discuss the development of this FMP.

Proposed rule – a federal regulation is often published in the Federal Register as a proposed rule with a time for public comment. After the comment period closes, the proposed regulation may be changed or withdrawn before it is published as a final rule, along with its date of implementation and response to comments.

Rebuilding plan – a plan designed to increase stock biomass to the BMSY level within no more than ten years (or 10 years plus one mean generation period) when a stock has been declared overfished.

Recruitment overfishing – fishing at an exploitation rate that reduces the population biomass to a point where recruitment is substantially reduced.

Recruitment – the amount of fish added to the fishery each year due to growth and/or migration into the fishing area. For example, the number of fish that grow to become vulnerable to fishing gear in one year would be the recruitment to the fishery. “Recruitment” also refers to new year classes entering the population (prior to recruiting to the fishery).

Regulated groundfish species – cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake, and redfish. These species are usually targeted with large-mesh net gear.

Relative exploitation – an index of exploitation derived by dividing landings by trawl survey biomass. This variable does not provide an estimate of the proportion of removals from the stock due to fishing but allows for general statements about trends in exploitation.

Sediment – Material deposited by water, wind, or glaciers.

Spawning stock biomass (SSB) – the total weight of fish in a stock that sexually mature, i.e., are old enough to reproduce.

Status determination criteria – objective and measurable criteria used to determine if overfishing is occurring or if a stock is in an overfished condition according to the National Standard Guidelines.

Stock assessment – An analysis for determining the number (abundance/biomass) and status (life-history characteristics, including age distribution, natural mortality rate, age at maturity, fecundity as a function of age) of individuals in a stock.

Stock – A grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. A region may have more than one stock of a species (for example, Gulf of Maine cod and Georges Bank cod). A species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

Surplus production models – A family of analytical models used to describe stock dynamics based on catch in weight and CPUE time series (fishery dependent or survey) to construct stock biomass history. These models do not require catch at age information. Model outputs may include trends in stock biomass, biomass weighted fishing mortality rates, MSY, FMSY, BMSY, K, (maximum population biomass where stock growth and natural deaths are balanced) and r (intrinsic rate of increase).

Surplus production – Production of new stock biomass defined by recruitment plus somatic growth minus biomass loss due to natural deaths. The rate of surplus production is directly proportional to stock biomass and its relative distance from the maximum stock size at carrying capacity (K). BMSY is often defined as the biomass that maximizes surplus production rate.

Survival rate (S) – Rate of survival expressed as the fraction of a cohort surviving the period compared to number alive at the beginning of the period ($\#$ survivors at the end of the year / numbers alive at the beginning of the year). Pessimists convert survival rates into annual total mortality rate using the relationship $A=1-S$.

Survival ratio (R/SSB) – an index of the survivability from egg to age-of-recruitment. Declining ratios suggest that the survival rate from egg to age-of-recruitment is declining.

TAC – Total allowable catch is equivalent to the ICL.

TAL – Total allowable landings.

Ten-minute- “squares” of latitude and longitude (TMS) – A measure of geographic space. The actual size of a ten-minute-square varies depending on where it is on the surface of the earth, but in general each square is about 70-80 square nautical miles at 40° of latitude. This is the spatial area that EFH designations, biomass data, and some of the effort data have been classified or grouped for analysis.

Total mortality – The rate of mortality from all sources (fishing, natural, pollution) Total mortality can be expressed as an instantaneous rate (called Z and equal to $F + M$) or Annual rate (called A and calculated as the ratio of total deaths in a year divided by number alive at the beginning of the year)

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10.0 APPENDICES

10.1 APPENDIX A – ADDITIONAL DECISION SUPPORT TOOL INFORMATION

A subset of the Decision Support Tool (DST) results were included in Section 6.1.1 including the total gear (number of nets) present in the proposed time/area closure, the amount of gear present after the proposed time/area closures was implemented, the percentage coastwide reduction in gear, the total gear removed, the total gear subject to the time/area closures, and the percentage of gear removed from time/area closures.

These DST results include a maximum distance for gear displacement (how far a vessel would travel) of 20 mi and 50 mi. The visual representation of the amount and location of gear displacement are included in the figures below.

Figure 41. Alternative 2 – 20 mi maximum distance for gear displacement.

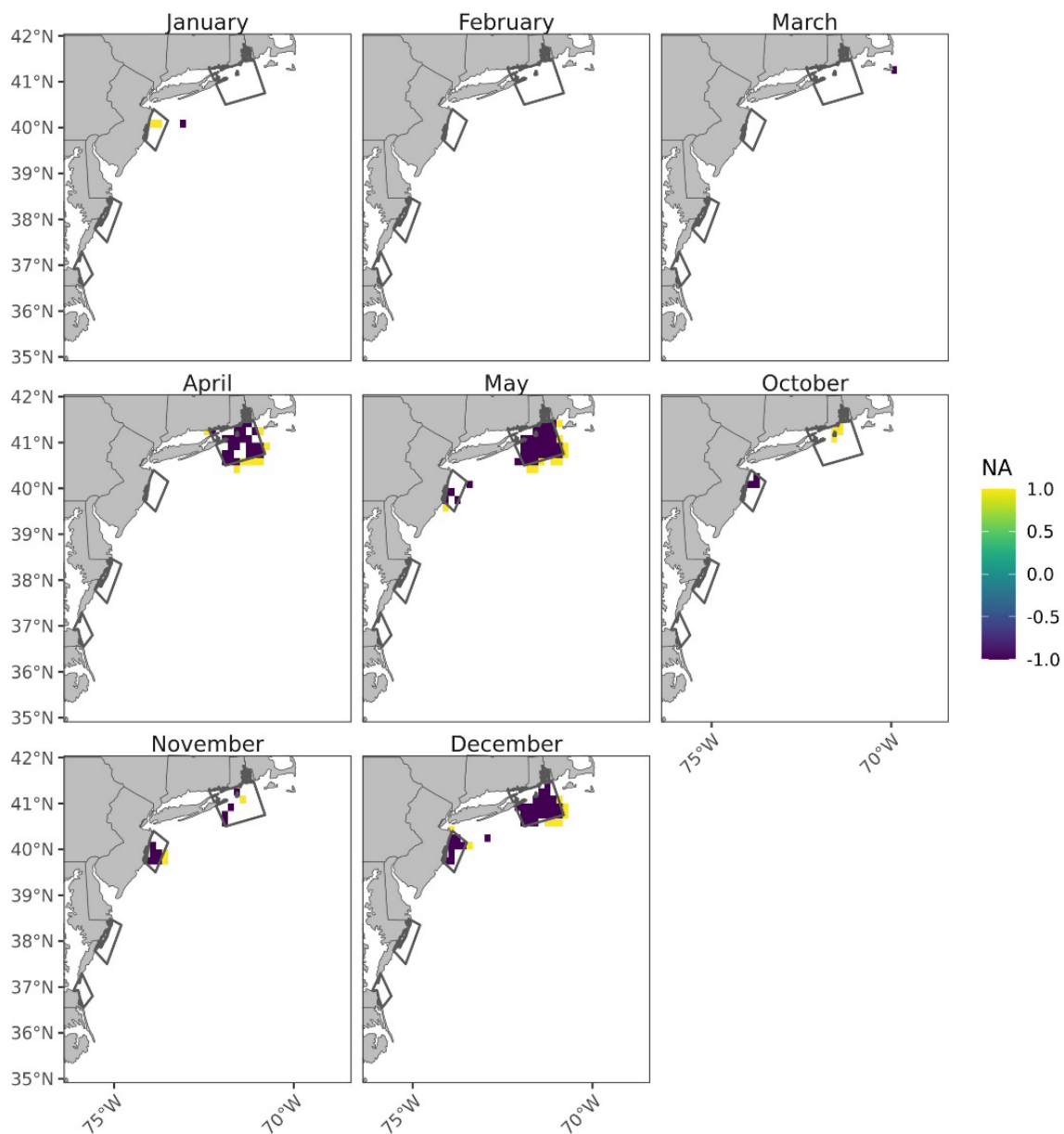


Figure 42. Alternative 2 - 50 mi maximum distance for gear displacement.

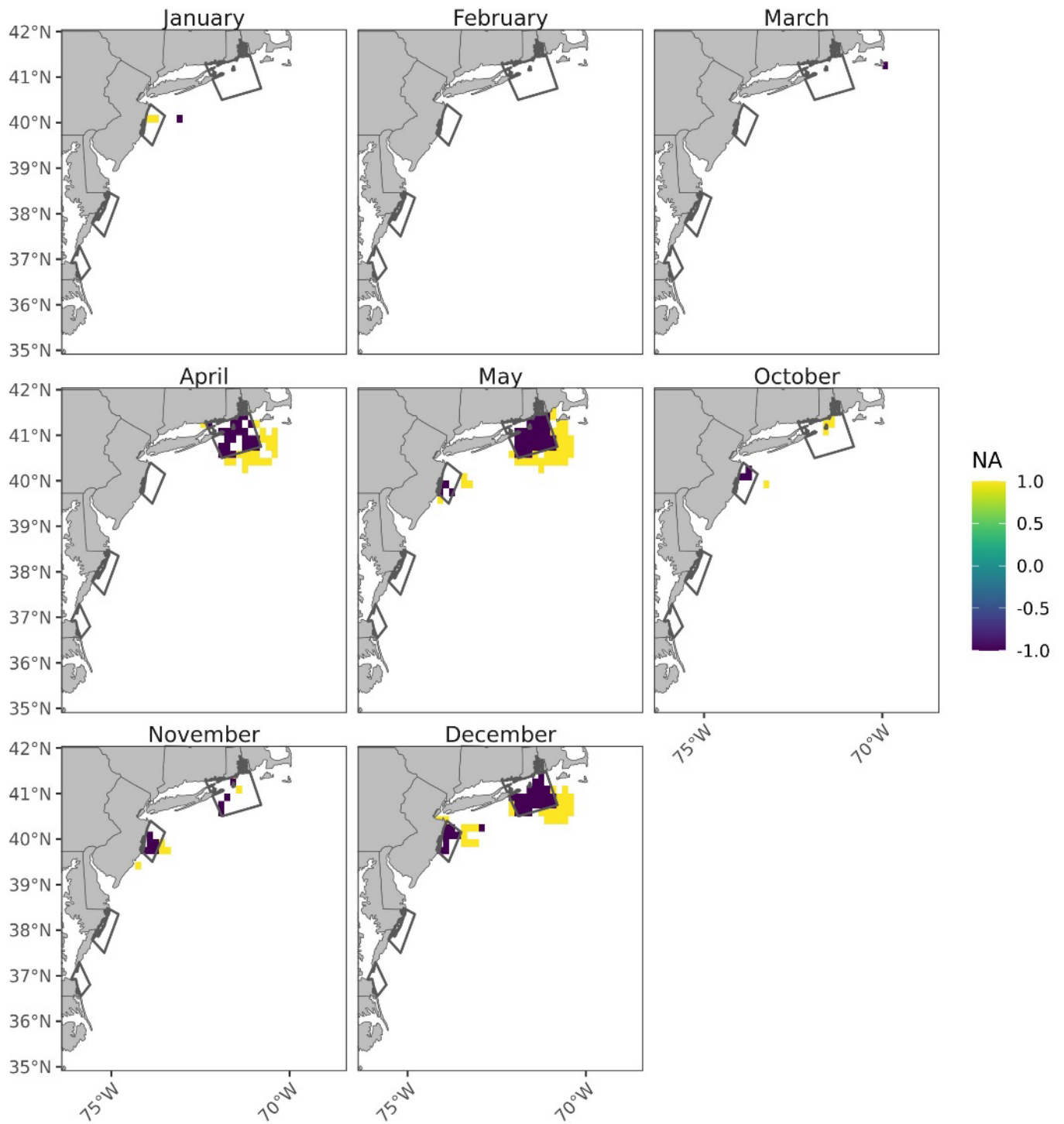


Figure 43. Alternative 3 - 20 mi maximum distance for gear displacement.

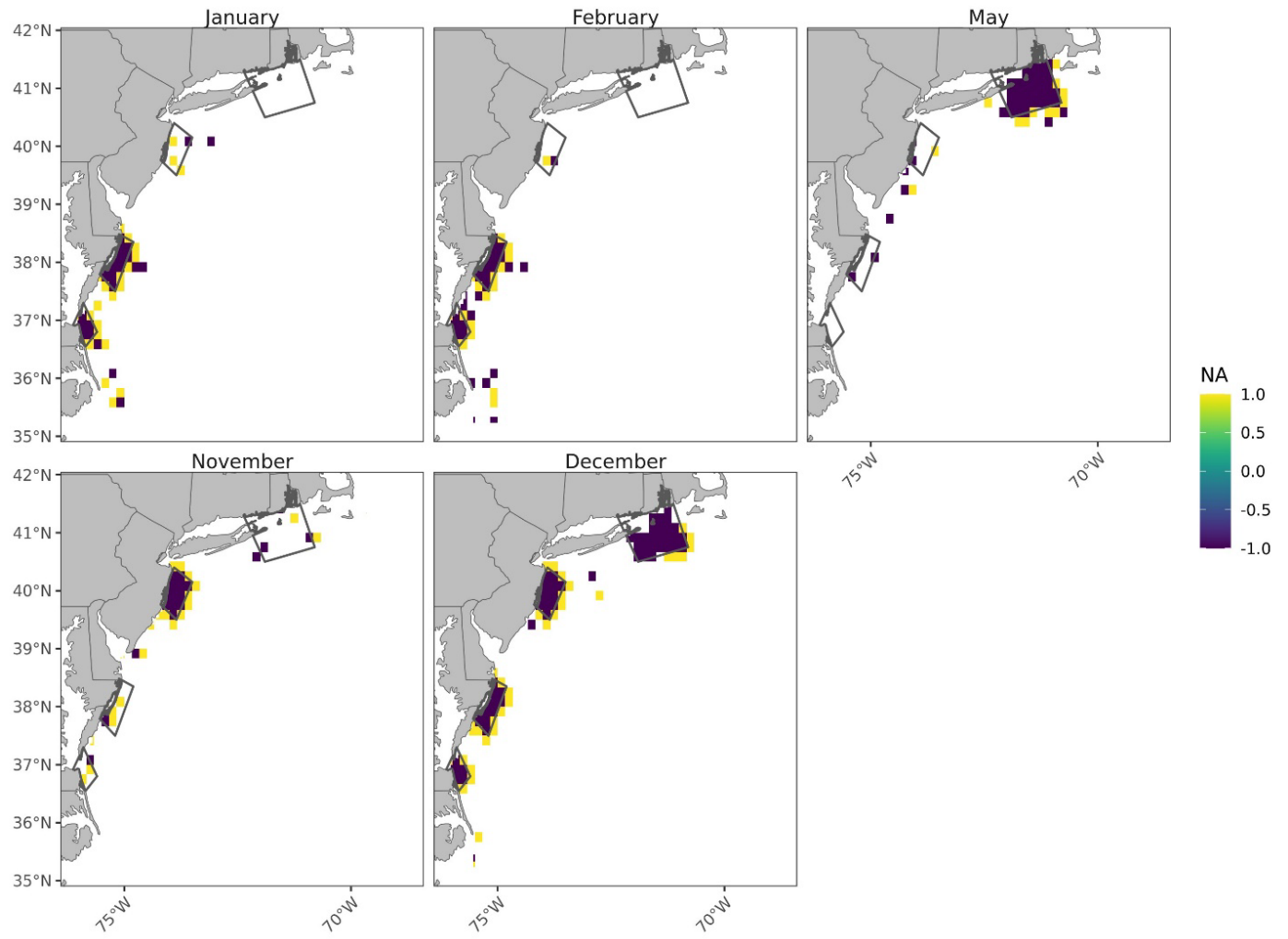


Figure 44. Alternative 3 - 50 mi maximum distance for gear displacement.

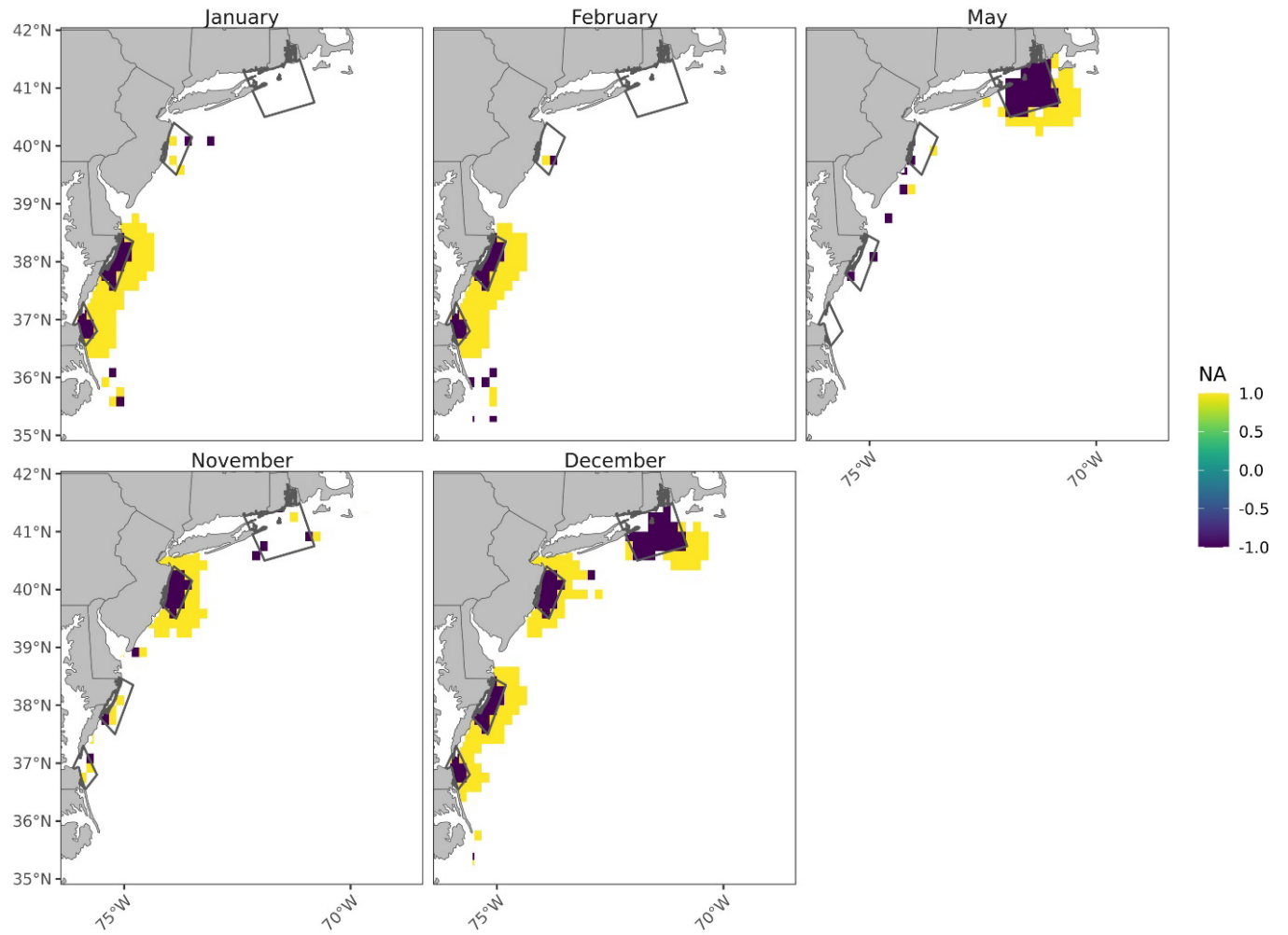


Figure 45. Alternative 4 - 20 mi maximum distance for gear displacement.

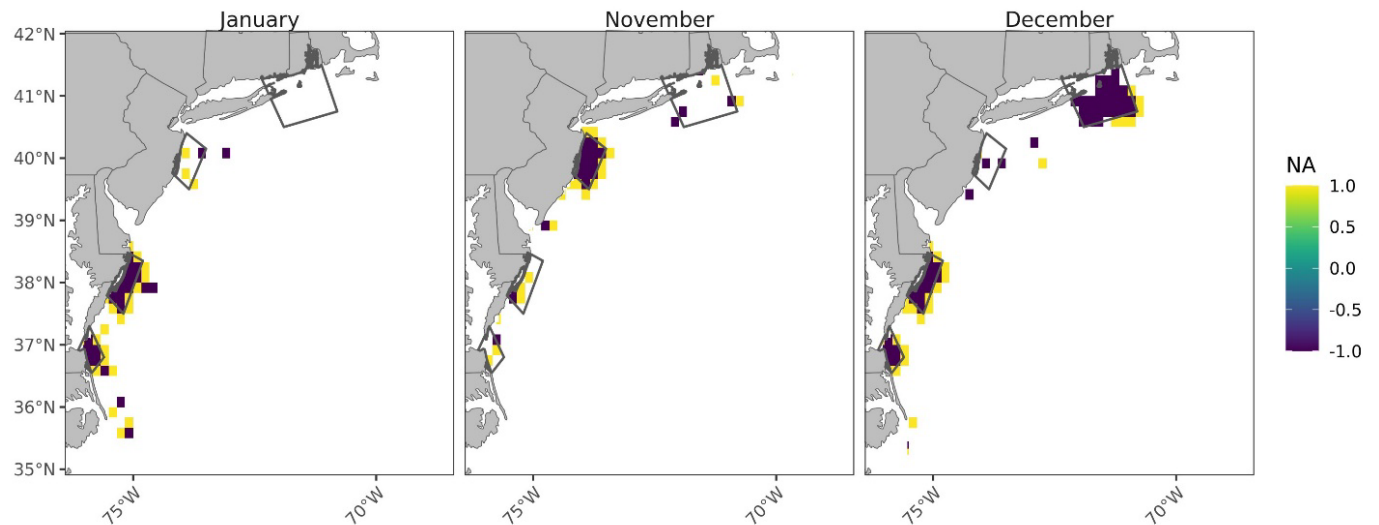
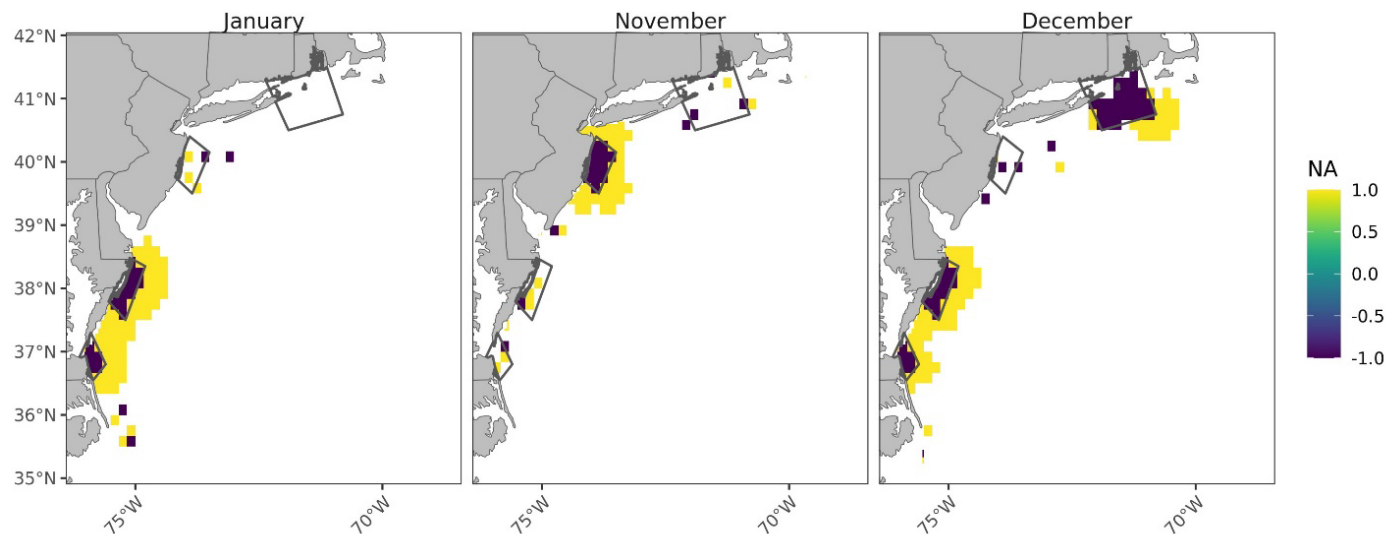


Figure 46. Alternative 4 - 50 mi maximum distance for gear displacement.



DST Industry Meeting Notes

From December 2023 through January 2024, the Joint Dogfish/Monkfish FMAT/PDT has been working to package alternatives under consideration in a Joint Framework Action to address Atlantic sturgeon bycatch in the dogfish and monkfish fisheries. To account for the potential effort shifts that may occur as the result of some closure area alternatives under consideration, the FMAT/PDT requested that the Atlantic Large Whale Take Reduction Team's (ALWTRT) Decision Support Tool (DST) be used. The DST team advised that industry input was necessary to accurately model fishing behavior, particularly willingness and ability to change location in response to implementation of closure areas. The FMAT/PDT held a series of two informal sessions with members of industry already familiar with the application of the TRT or who were members of either the monkfish or dogfish advisory panels.

Meeting 1 Jan 9, 2024

Two industry members were in attendance, both from New Jersey.

NMFS GARFO staff explained the current status of the Framework Action under development, the incorporation of the DST in that development and the need for industry input. Industry members were shown the different alternatives packages, including the closure areas.

Feedback was as summarized below:

- The DST simplifies movement; it considers distance between where gear is pre-closure and where it can move to, but it does not consider homeport of the affected vessels. Depending on where a vessel is homeported, a closure could be more or less impactful than the DST might predict.
 - The SNE area in particular may be problematic, since the homeport for the bulk of those vessels may be too far from alternative grounds.
- Since the DST looks at places where people are fishing now to identify where gear could move, it is unable to allocate gear to historic fishing grounds that are not currently fished, but could be.
- The DST does not account for gear conflicts or the space needed between gillnet sets.
- Dynamics that affect fisherman decision-making regarding when and where to set gear are very complex and ever changing. Wind energy development, for example, is unaccounted for, and could affect industry behavior in unpredictable ways. This also affects decision making surrounding decisions to fish at all – all of the compounding issues in the fishery will cause a portion of the industry out of business. Fish prices in these fisheries have not been strong in recent years.
- It would be useful if charts showing these closure areas included others, such as the Harbor Porpoise Take Reduction Plan closures/regulated areas.
- Fishermen from Point Pleasant may steam to the other side of the mudhole

Meeting 2, January 17, 2024

Five industry members were in attendance, with participants from across the affected area (i.e. VA to SNE).

NMFS GARFO staff ran through the same explanation as was provided at the Jan 9 meeting, but the DST team prepared new slides showing the alternatives and DST results.

Feedback was as summarized below:

- A similar discussion as was held on January 9th regarding the lack of information about vessel homeport
- With a monkfish season in SNE that lasts from April to June, a May closure would result in fishermen from RI simply not fishing during that entire period. The effort and cost to start up fishing in the spring just to be shut out in May would prevent the business from being profitable.
 - Areas southeast of the SNE closure do not seem realistic, and may conflict with as yet unknown Atlantic Large Whale measures.
 - One industry member believed that the % of gear removed from SNE in alternative 2 was an underestimate
- There was low confidence in the ability for sturgeon to be adequately tracked and distribution understood.
- Industry members generally did not like data that showed % of coastwide gear affected by the alternatives, given that it may underemphasize the effect these measures would have on affected industry.

- It was noted that the bulk of the bycatch reduction would come from full removal of gear from the water; these fisheries have few alternatives for the participants.
 - There was concern about the potential for success of these closures in comparison to their impact on the fishery.
 - Industry in attendance stated that they were discouraged that they and their cohort would be able to weather the closures as currently structured
- Not relevant to the discussion about effort shifts, but the group did briefly discuss the potential for low-profile gillnet gear as a solution, though more development is needed for it to be widely adoptable by industry

After the conclusion of the meeting, an industry member who had audio trouble reached out to NMFS GARFO staff to communicate comments that he intended to provide during the meeting. These were:

- VA beach closures would result in vessel movement south, where more sturgeon would be expected to be encountered. Any reduction that is achieved by the closure areas would occur as a result of gear removal
 - The area covering the mouth of the bay might be particularly important to close, however.
- Large potential for negative impacts to the dogfish fishery which is already struggling.

10.2 APPENDIX B – FINAL REPORT FROM DR. HOCKING

Atlantic Sturgeon Takes Under Closure Alternatives

Daniel J. Hocking NOAA/NMFS/GARFO

January 29, 2024

This analysis calculates the risk of sturgeon takes per unit effort and combines that with various alternative actions involving gillnet closure areas by different months.

Gear Removal and Redistribution

The Large Whale Take Reduction Team's NEFSC analyst, Laura Solinger, used the decision support tool (DST) to evaluate how gear would be moved or not fished under each scenario and relative to the baseline (gillnet gear effort distribution from 2017-2020).

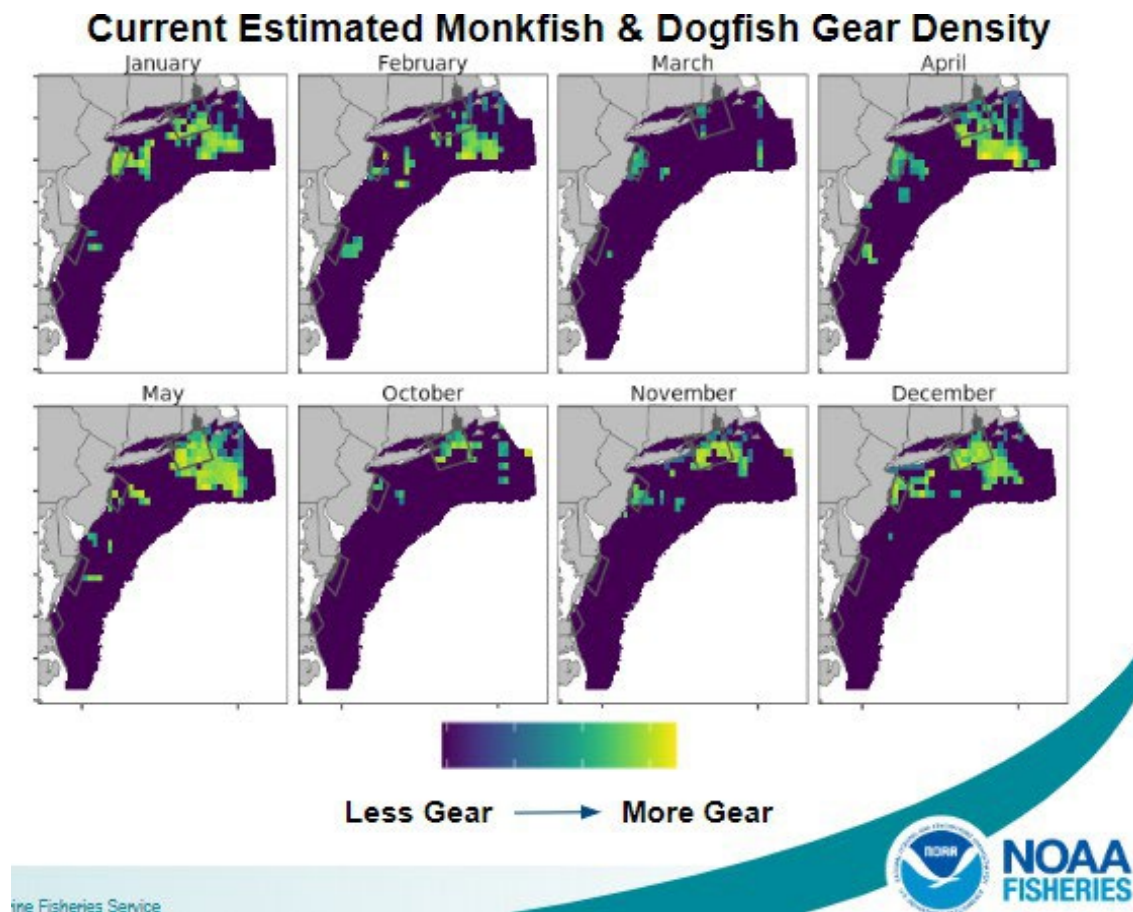


Figure 1: Example of current gillnet gear distribution relative to closure polygons.

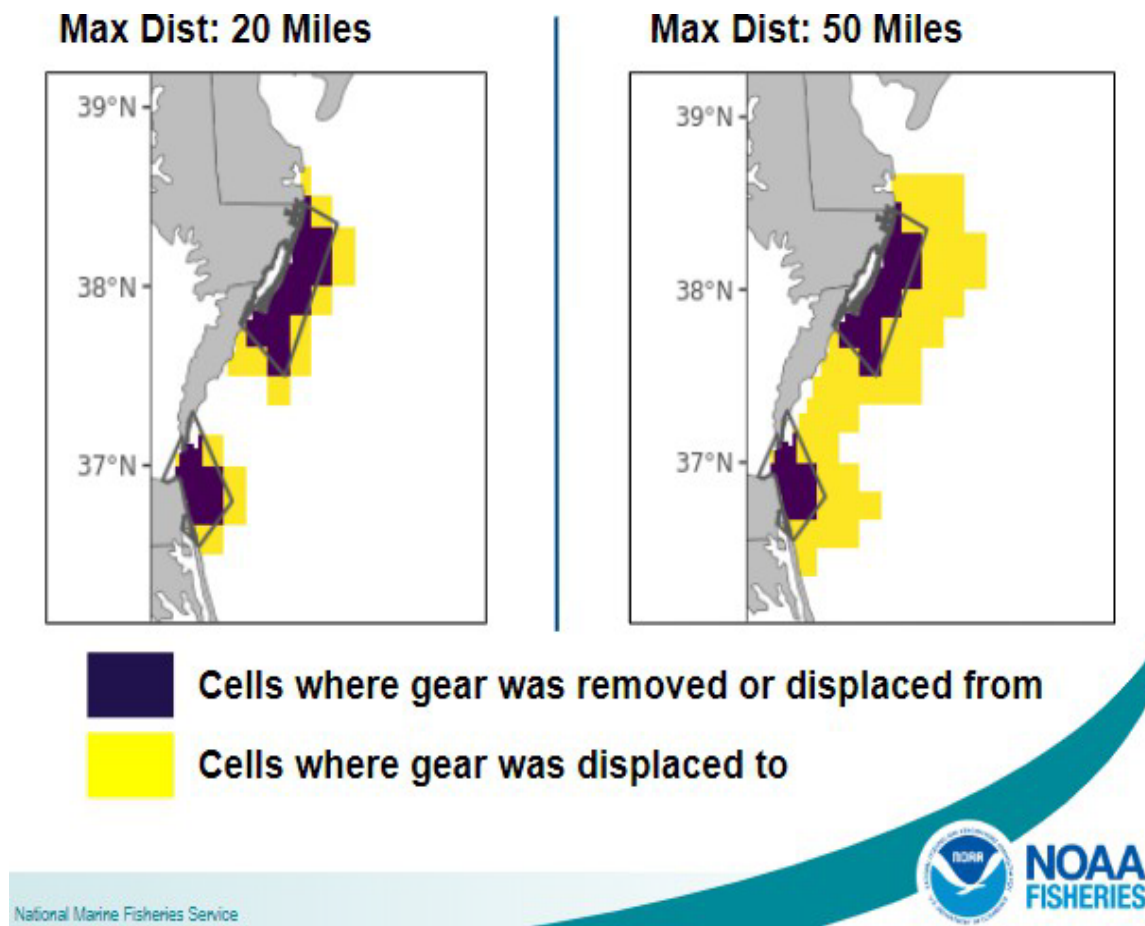


Figure 2: Example of gear redistribution based on maximum distance vessels will move in response to closures.

Create Risk Layer

The Northeast Fisheries Science Center (NEFSC) generated estimates of total annual discards of Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) from 2000 - 2022 in the otter trawl and gillnet fisheries. The analysis was conducted most recently by Boucher and Curti (2022) following the methods used by Miller and Shepherd (2011), Miller (2015), and Curti (2016). The general approach was to use observer data to estimate discards as a function of gear type, year, quarter of the year, and species landed. The resulting generalized linear model was then applied to data from all federal commercial gillnet trips.

I created a risk distribution layer for sturgeon by taking the NEFSC sturgeon gillnet take model and predicting it to all gillnet trips from 2012-2022 (2020 drops out due to lack of data in the NEFSC model). Data back to 2012 were used for the risk mapping because sturgeon takes are low probability events and more data was needed to create a smooth layer for when vessels move to areas with previously little fishing effort during 2017-2022. Without going back to 2012 for sturgeon risk the map becomes disjunct with gaps that were difficult to smooth. The trade-off with this approach is that sturgeon populations, movements, and gear selectivity can change over this time frame. However, the informal sensitivity analysis using only 2017 - 2022 data did not show large differences compared to the current analysis.

The expected sturgeon takes on each trip from the model results were then divided by the effort (days fished) on that trip. I removed the upper and lower 5% of effort trips from the risk mapping because effort can be misreported with fixed gear and this change in the denominator would have large effects on the rates (e.g. trip lands thousands of pounds of fish and discarded a sturgeon but the effort was only recorded as 5 minutes

resulting in an expectation of 288 sturgeon takes per day at that location). Additionally, a minimum of 2 fishing hours was required for data inclusion in the risk mapping. The point-estimates from trips were then smoothed using inverse distance weighted interpolation by month to create smoother risk layers with gaps filled in. A distance-decay coefficient of 1.8 was used to weight closer trips more and balance local vs regional smoothing effects.

Expected Sturgeon Takes per Day Fished

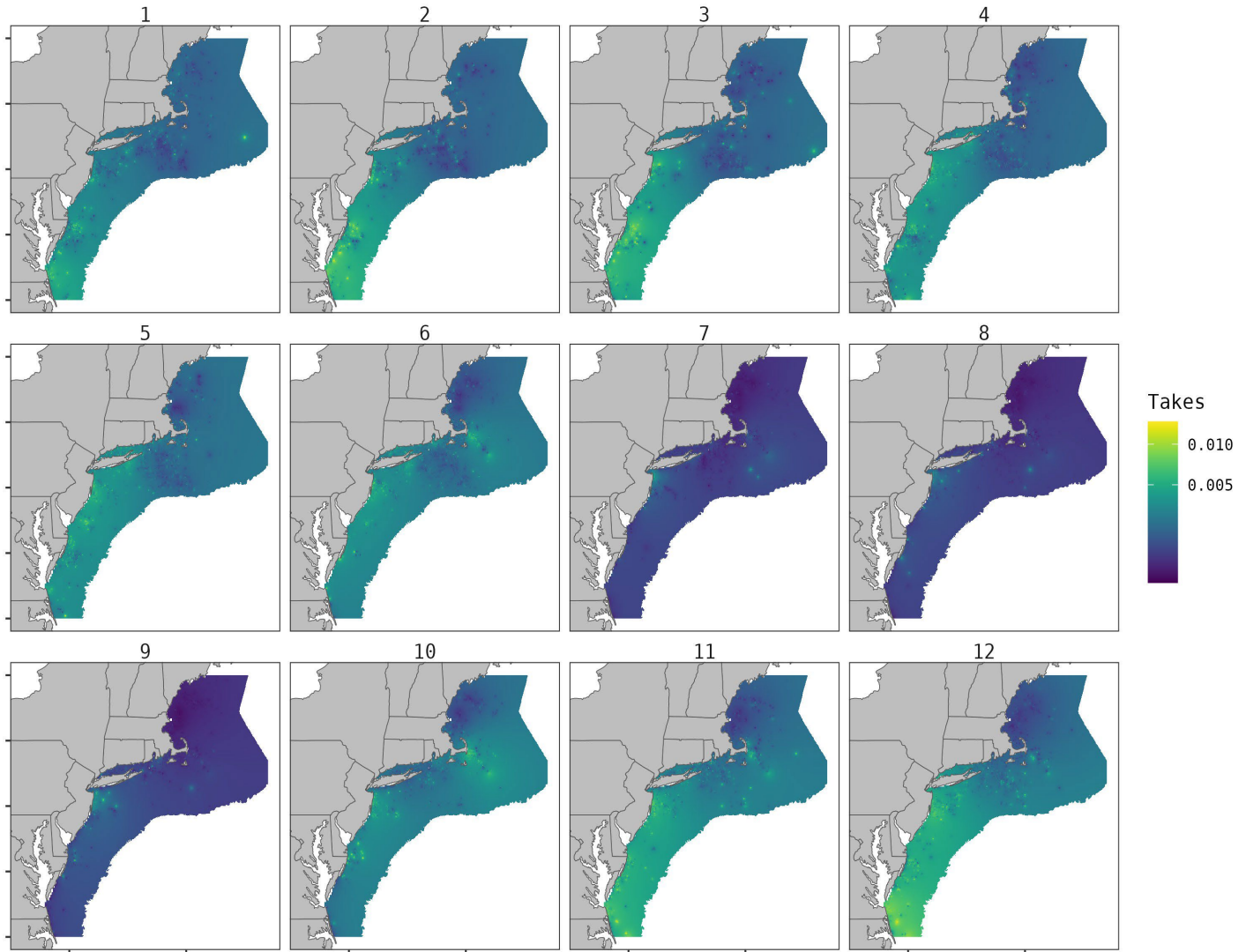


Figure 3: Expected Atlantic sturgeon takes per unit effort (days fished) by month.

Risk x Gear Density

I overlaid the resulting monthly risk maps on the various monthly scenario maps and multiplied the risk per unit effort by the total effort in each raster square to get an index of the total estimated takes in each square under each gear movement/removal scenario. I finally calculated the percent total reduction in sturgeon takes expected under each scenario.

Changes in Sturgeon Takes Alt1_MaxDist20

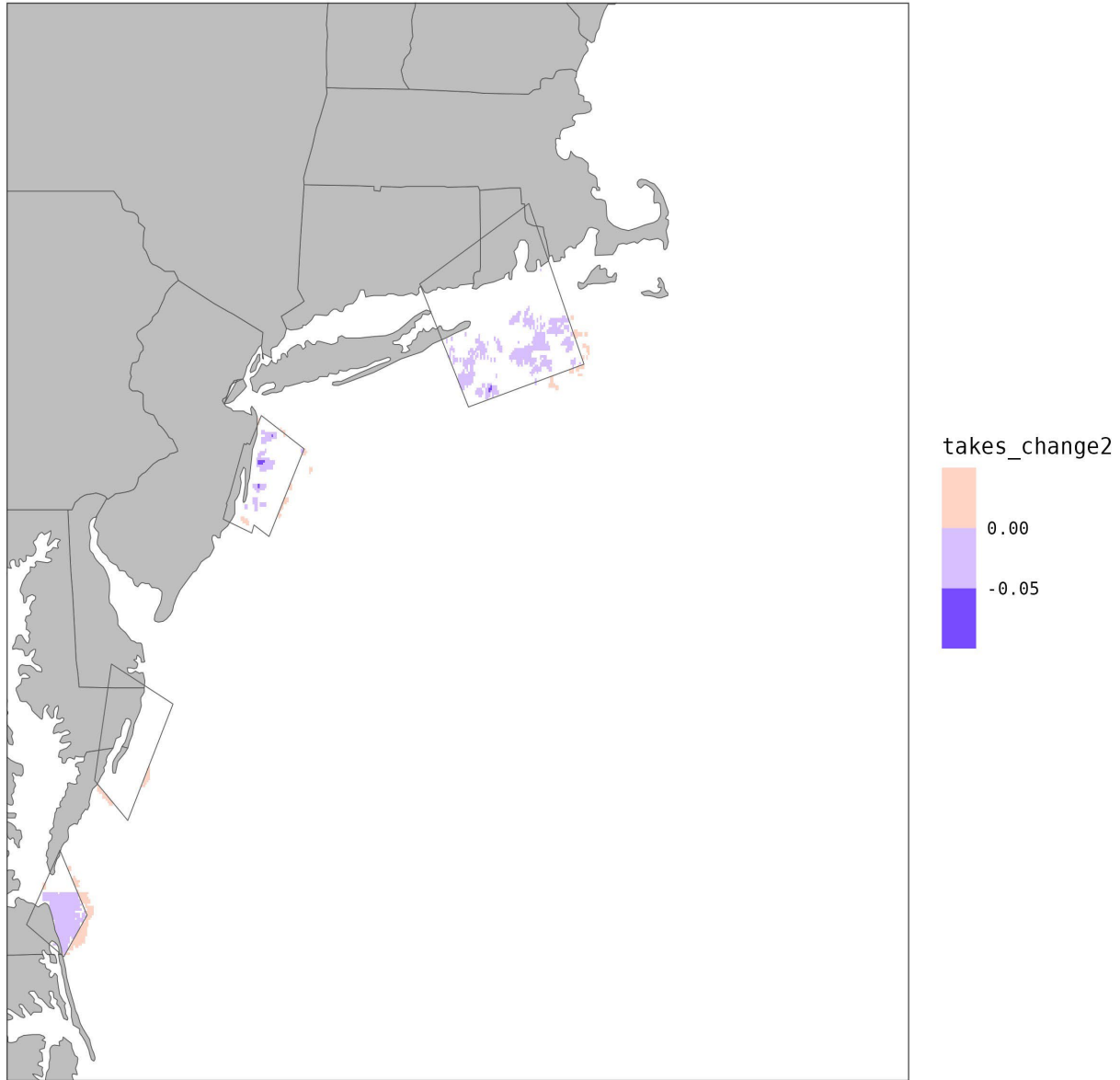


Figure 4: Example of change in sturgeon takes under alternative action 2 in December assuming a maximum distance of 20 nautical miles vessels will move from current fishing areas. In this scenario, most of the gear is removed from fishing due to lack of suitable fishing locations within the maximum distance allowed. Little gear is redistributed.

Changes in Sturgeon Takes Alt3_MaxDist50

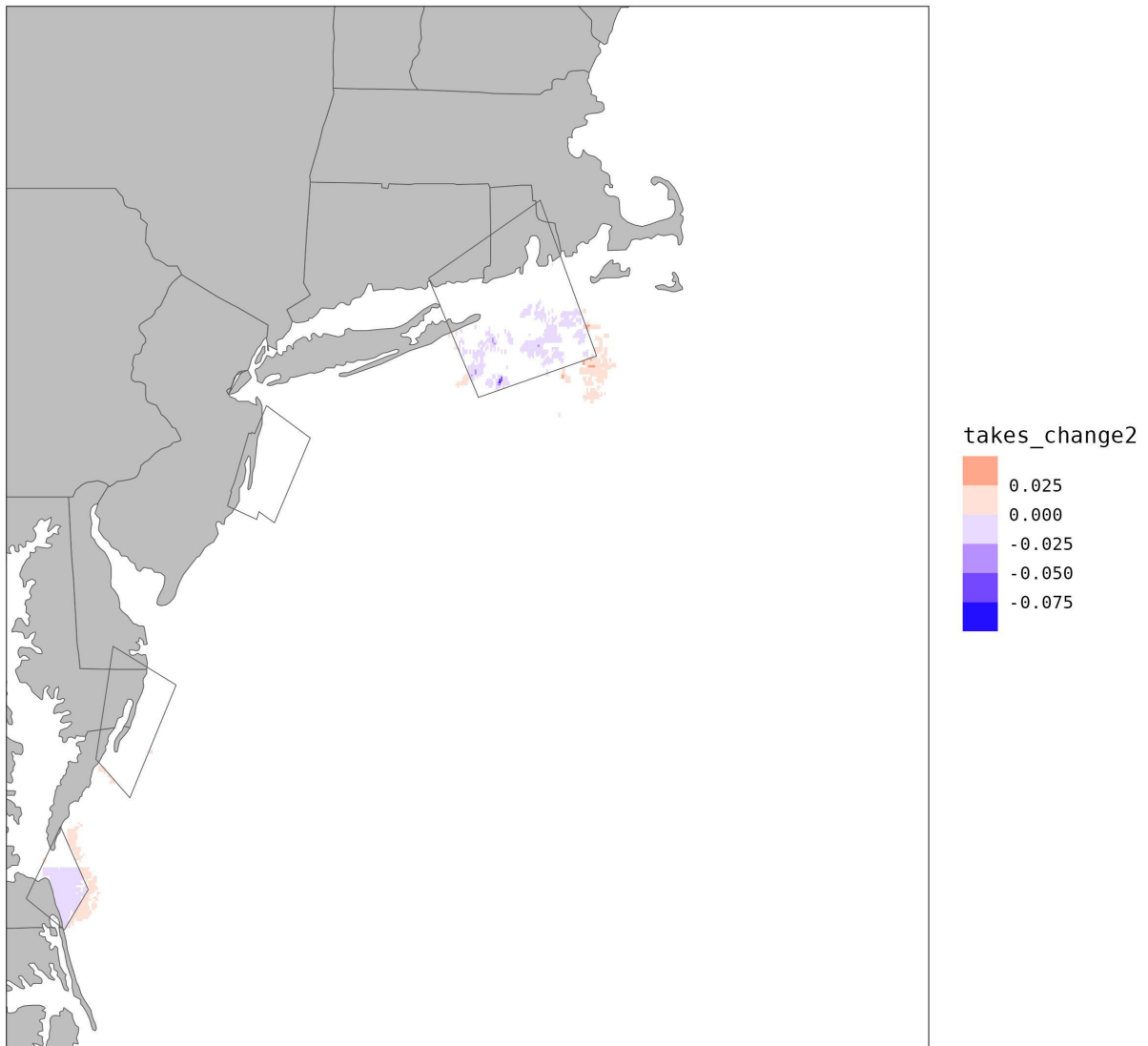


Figure 5: Example of change in sturgeon takes under alternative action 4 in December assuming a maximum distance of 50 nautical miles vessels will move from current fishing areas. In this scenario, most of the gear redistributes to other areas and little is removed. The results is only a slight decrease in expected sturgeon takes.

Table 1: Expected percent reduction of Atlantic Sturgeon takes by federally-permitted vessels using gillnet gears under various actions and behavior (max movement distance) scenarios. Action 1 is ‘no action’ and other alternatives not involving closures are also not listed.

<i>Action</i>	<i>Max Distance Move (nm)</i>	<i>Percent Reduction</i>
2	20	13.00%
2	50	4.20%
3	20	10.60%
3	50	3.20%
4	20	4.10%
4	50	1.90%

References

- Boucher, J.M. and Curti, K.L. 2022. Discard Estimates for Atlantic Sturgeon through 2021. White paper (unpublished).
- Curti, K., 2016. Updated Summary of Discard Estimates for Atlantic Sturgeon (White paper). NOAA/NMFS, Woods Hole, MA: Population Dynamics Branch.
- Miller, T. J., and Shepherd, G.R. 2011. Summary of discard estimates for Atlantic sturgeon (White paper). NOAA/NMFS, Woods Hole, MA: Population Dynamics Branch.
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10.3 APPENDIX C – JANUARY 2024 TAKE ESTIMATE UPDATE

Discard Estimates for Atlantic Sturgeon Federal Waters

Daniel J. Hocking NOAA/NMFS/GARFO

Last Updated on 19 January 2024

The Northeast Fisheries Science Center (NEFSC) generated estimates of total annual discards of Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) from 2000 - 2021 in the otter trawl and gillnet fisheries. The analysis was conducted most recently by Boucher and Curti (2022) following the methods used by Miller and Shepherd (2011), Miller (2015), and Curti (2016). The general approach was to use observer data to estimate discards as a function of gear type, year, quarter of the year, and species landed. The resulting generalized linear model was then applied to data from modified vessel trip reports (VTR) in the NEFSC VESLOG to estimate total sturgeon discards and resulting mortality for all federally permitted vessels in state and federal waters.

Here we apply the models from Boucher and Curti (2022) to otter trawl and gillnet data on subtrips in federal waters. To best match the data used in the assessment, we used data from the Catch Accounting and Management System (CAMS) but restricted to data with valid latitude and longitude from a VTR that indicated they actively fished in non-coastal waters, as done through VESLOG data in the assessment. We further filtered the data to only trips with VTR fishing locations in federal waters.

The best trawl model did not include any year-specific predictor variables, therefore we were able to estimate discards for all years, including those not in the observer data used for model fitting (e.g. 2020). For years without observer-specific mortality rates, we used the mean across other years. The best gillnet model included year, species by year, and quarter by year as independent predictors, therefore discards could only be estimated for years used in the model fitting (e.g. not 2020).

The results presented in the tables below are estimates from federally-permitted vessels fishing in federal waters and reporting valid location data. The results do not always coincide precisely with those from the assessment due to slight differences in the data used and in some cases the federal bycatch presented here can be higher than the mean total estimate from the assessment but those are in situations of high uncertainty and fall well within the confidence interval.

Table 1: Annual estimates of Atlantic Sturgeon discards by federally permitted vessels in federal waters using bottom otter trawl gear.

Year	Total Federal Bycatch	Standard Error	Proportion Dead	Dead Bycatch	Lower CI (2.5%)	Upper CI (97.5%)
1996	779	115	0.035	27	20	35
1997	837	99	0.035	30	23	36
1998	749	80	0.035	26	21	32
1999	1446	664	0.035	51	5	97
2000	986	199	0.000	0	0	0
2001	721	79	0.000	0	0	0
2002	804	80	0.000	0	0	0
2003	665	66	0.000	0	0	0
2004	651	60	0.000	0	0	0
2005	639	63	0.143	91	74	109
2006	724	72	0.179	130	104	155
2007	591	68	0.086	51	39	62
2008	721	176	0.161	116	61	172
2009	712	82	0.021	15	12	18
2010	585	53	0.009	5	4	6
2011	557	50	0.000	0	0	0
2012	533	47	0.000	0	0	0
2013	547	53	0.000	0	0	0
2014	493	40	0.000	0	0	0
2015	409	29	0.000	0	0	0
2016	397	30	0.000	0	0	0
2017	359	28	0.000	0	0	0
2018	338	31	0.080	27	22	32
2019	401	33	0.000	0	0	0
2020	369	36	0.035	13	11	16
2021	354	32	0.062	22	18	26
2022	310	26	0.035	11	9	13

Table 2: Annual estimates of Atlantic Sturgeon discards by federally permitted vessels in federal waters using drift or sink gillnet gear.

Year	Total Federal Bycatch	Standard Error	Proportion Dead	Dead Bycatch	Lower CI -2.50%	Upper CI -97.50%
1996			0.297			
1997			0.297			
1998			0.297			
1999			0.297			
2000	1551	582	0.128	199	53	344
2001	607	483	0.298	181	0	463
2002	2643	1989	0.24	634	0	1570
2003	411	116	0.212	87	39	135
2004	957	228	0.487	466	249	684
2005	511	145	0.306	156	69	244
2006	821	172	0.124	102	60	143
2007	781	231	0.2	156	66	247
2008	531	327	0.279	148	0	327
2009	843	270	0.129	109	40	177
2010	392	76	0.507	199	123	274
2011	434	152	0.44	191	60	322
2012	354	85	0.435	154	81	227
2013	1233	390	0.375	462	175	749
2014	482	111	0.333	160	88	233
2015	598	89	0.277	166	117	214
2016	1336	137	0.316	422	337	507
2017	709	91	0.216	153	115	191
2018	885	115	0.265	235	175	294
2019	734	84	0.2	147	114	180
2020			0.297			
2021	393	100	0.462	181	91	272
2022	408	70	0.297	121	80	161

Table 3: Annual percent of Atlantic Sturgeon discards by federally-permitted vessels in federal waters using otter trawl gear.

Year	Total Bycatch	Federal Bycatch	State Bycatch	Percent Federal Waters Bycatch	Proportion Dead	Federal Dead	State Dead	Percent Federal Waters Dead
1996	1569	779	791	49.6	0.035	27	28	49.1
1997	1735	837	898	48.2	0.035	30	31	49.2
1998	1695	749	946	44.2	0.035	26	33	44.1
1999	2840	1446	1394	50.9	0.035	51	49	51
2000	1996	986	1010	49.4	0	0	0	
2001	1872	721	1152	38.5	0	0	0	
2002	1734	804	930	46.4	0	0	0	
2003	1644	665	979	40.5	0	0	0	
2004	1434	651	782	45.4	0	0	0	
2005	1231	639	591	51.9	0.143	91	85	51.7
2006	1391	724	668	52	0.179	130	120	52
2007	1198	591	607	49.3	0.086	51	52	49.5
2008	1283	721	562	56.2	0.161	116	90	56.3
2009	1238	712	526	57.5	0.021	15	11	57.7
2010	1235	585	650	47.4	0.009	5	6	45.5
2011	1206	557	648	46.2	0	0	0	
2012	1120	533	586	47.6	0	0	0	
2013	1206	547	659	45.4	0	0	0	
2014	1078	493	585	45.7	0	0	0	
2015	1005	409	595	40.7	0	0	0	
2016	945	397	548	42	0	0	0	
2017	927	359	567	38.8	0	0	0	
2018	905	338	567	37.3	0.08	27	45	37.5
2019	1001	401	600	40.1	0	0	0	
2020	883	369	514	41.8	0.035	13	18	41.9
2021	805	354	452	43.9	0.062	22	28	44
2022	664	310	354	46.7	0.035	11	12	47.8

Table 4: Annual percent of Atlantic Sturgeon discards by federally-permitted vessels in federal waters using drift or sink gillnet gear.

Year	Total Bycatch	Federal Bycatch	State Bycatch	Percent Federal Waters Bycatch	Proportion Dead	Federal Dead	State Dead	Percent Federal Waters Dead
1996					0.297			
1997					0.297			
1998					0.297			
1999					0.297			
2000	3062	1551	1511	50.6	0.128	199	193	50.8
2001	1717	607	1110	35.4	0.298	181	331	35.4
2002	4058	2643	1415	65.1	0.24	634	340	65.1
2003	2317	411	1906	17.7	0.212	87	404	17.7
2004	1740	957	782	55	0.487	466	381	55
2005	808	511	297	63.3	0.306	156	91	63.2
2006	1439	821	619	57	0.124	102	77	57
2007	1449	781	668	53.9	0.2	156	134	53.8
2008	943	531	412	56.3	0.279	148	115	56.3
2009	1871	843	1028	45.1	0.129	109	133	45
2010	557	392	166	70.3	0.507	199	84	70.3
2011	552	434	118	78.6	0.44	191	52	78.6
2012	483	354	129	73.3	0.435	154	56	73.3
2013	1689	1233	457	73	0.375	462	171	73
2014	707	482	225	68.2	0.333	160	75	68.1
2015	1073	598	475	55.7	0.277	166	131	55.9
2016	1930	1336	594	69.2	0.316	422	188	69.2
2017	1573	709	865	45.1	0.216	153	187	45
2018	1266	885	381	69.9	0.265	235	101	69.9
2019	1274	734	539	57.6	0.2	147	108	57.6
2020					0.297			
2021	692	393	299	56.8	0.462	181	138	56.7
2022	822	408	415	49.6	0.297	121	123	49.6

The percent of sturgeon bycatch and takes by federally-permitted vessels in federal waters relative to these vessels in total ranged from 37.3 to 57.5 for otter trawl trips and from 17.7 to 78.6 on gillnet trips. These percentages do not include any bycatch or takes by state vessels or vessels otherwise not required to submit a VTR.

References

- Boucher, J.M. and Curti, K.L. 2022. Discard Estimates for Atlantic Sturgeon through 2021. White paper (unpublished).
- Curti, K. 2016. Updated Summary of Discard Estimates for Atlantic Sturgeon (White paper). NOAA/NMFS, Woods Hole, MA: Population Dynamics Branch.
- Miller, T. .T., and Shepherd, G.R. 2011. Summary of discard estimates for Atlantic sturgeon (White paper). NOAA/NMFS, Woods Hole, MA: Population Dynamics Branch.
- Miller, T..J. 2015. Updated summary of discard estimates for Atlantic sturgeon (White paper). NOAA/NMFS, Woods Hole, MA: Population Dynamics Branch. Provided to the Atlantic States Marine Fisheries Commission.

10.4 APPENDIX D – MONKFISH AND DOGFISH LANDINGS RELATIVE TO PROPOSED STURGEON MEASURE AREAS

Dr. Daniel Hocking of NMFS' Greater Atlantic Regional Office staff calculated the following for Monkfish and Spiny Dogfish. The following table captions were developed by Council staff to further explain and describe Dr. Hocking's March 13, 2024 report that is proceeding the table captions.

Monkfish:

Table 1: Average monthly coastwide monkfish landings and revenue for 2020 - 2022.

Table 2: Average monthly coastwide gillnet monkfish landings and revenue for 2020 - 2022. (a portion of Table 1 results)

Southern New England Monkfish:

Table 3: Average monthly coastwide gillnet monkfish landings and revenue for 2020 – 2022 into New York, Connecticut, Rhode Island, and Massachusetts ports below Cape Cod. (a portion of Table 2 results)

Table 4: Average monthly coastwide gillnet monkfish landings and revenue for 2020 – 2022 into New York, Connecticut, Rhode Island, and Massachusetts ports below Cape Cod **from within the southern New England proposed area.** (a portion of Table 3 results)

Table 5: Proportion of average monthly coastwide gillnet monkfish landings and revenue for 2020 – 2022 into New York, Connecticut, Rhode Island, and Massachusetts ports below Cape Cod **from within the southern New England proposed area.** (i.e. what proportion of regional monkfish gillnet landings might be affected by the southern New England proposed area in each month)

New Jersey Monkfish:

Table 6: Average monthly coastwide gillnet monkfish landings and revenue for 2020 – 2022 into New Jersey. (a portion of Table 2 results)

Table 7: Average monthly coastwide gillnet monkfish landings and revenue for 2020 – 2022 into New Jersey **from within the New Jersey proposed area.** (a portion of Table 6 results)

Table 8: Proportion of average monthly coastwide gillnet monkfish landings and revenue for 2020 – 2022 into New Jersey **from within the New Jersey proposed area.** (i.e. what proportion of regional monkfish gillnet landings might be affected by the New Jersey proposed area in each month)

Spiny Dogfish:

Table 9: Average monthly coastwide spiny dogfish landings and revenue for 2020 - 2022.

Table 10: Average monthly coastwide gillnet spiny dogfish landings and revenue for 2020 - 2022. (a portion of Table 9 results)

New Jersey Spiny Dogfish:

Table 11: Average monthly coastwide gillnet spiny dogfish landings and revenue for 2020 – 2022 into New Jersey. (a portion of Table 10 results)

Table 12: Average monthly coastwide gillnet spiny dogfish landings and revenue for 2020 – 2022 into New Jersey from within the New Jersey proposed area. (a portion of Table 11 results)

Table 13: Proportion of average monthly coastwide gillnet spiny dogfish landings and revenue for 2020 – 2022 into New Jersey from within the New Jersey proposed area. (i.e. what proportion of regional spiny dogfish gillnet landings might be affected by the New Jersey proposed area in each month)

Maryland/Virginia Spiny Dogfish:

Table 14: Average monthly coastwide gillnet spiny dogfish landings and revenue for 2020 – 2022 into MD/VA. (a portion of Table 10 results)

Table 15: Average monthly coastwide gillnet spiny dogfish landings and revenue for 2020 – 2022 into MD/VA from within the Delmarva proposed areas. (a portion of Table 14 results)

Table 16: Proportion of average monthly coastwide gillnet spiny dogfish landings and revenue for 2020 – 2022 into MD/VA from within the Delmarva proposed areas. (i.e. what proportion of regional spiny dogfish gillnet landings might be affected by the Delmarva proposed areas in each month)

Monkfish and Dogfish Landings Relative to Proposed Sturgeon Measure Areas

Daniel J. Hocking NOAA/NMFS/GARFO
March 13, 2024

Monkfish

Table 1: Average coastwide monkfish landings and revenue for 2020 - 2022.

Month	Landed (lb)	Revenue
1	1,014,049	\$1,203,031
2	793,121	\$947,059
3	949,034	\$1,177,203
4	887,464	\$1,123,107
5	957,670	\$1,054,728
6	1,068,315	\$1,147,811
7	369,888	\$553,931
8	373,473	\$604,586
9	345,923	\$552,352
10	424,759	\$651,785
11	503,278	\$801,419
12	736,331	\$1,075,319

Table 2: Average coastwide monkfish landings and revenue for 2020- 2022 gillnet gear only.

Month	Landed (lb)	Revenue
1	255,880	\$324,111
2	122,132	\$144,786
3	303,383	\$341,481
4	298,150	\$343,023
5	691,703	\$721,880
6	817,386	\$855,278
7	175,523	\$296,010
8	164,233	\$299,782
9	142,279	\$254,251
10	100,519	\$175,907
11	88,191	\$167,155
12	181,805	\$283,581

Table 3: Average monthly monkfish landings and revenue for 2020 - 2022 gillnet gear only and landing in New York, Connecticut, Rhode Island, and Massachusetts ports below Cape Cod.

Month	Landed (lb)	Revenue
1	123,895	\$138,614
2	93,913	\$102,276
3	282,211	\$313,503
4	271,607	\$303,743
5	611,755	\$625,878
6	682,765	\$668,494
7	75,326	\$69,745
8	40,082	\$41,090
9	43,863	\$40,193
10	39,899	\$40,081
11	46,532	\$65,531
12	51,421	\$80,381

Table 4: Average monthly monkfish landings and revenue for 2020 - 2022 gillnet gear only that was within the southern New England proposed closure area.

Month	Landed (lb)	Revenue
1	38,644	\$43,220
2	9,632	\$10,683
3	24,570	\$31,856
4	29,824	\$36,526
5	407,034	\$388,354
6	495,853	\$456,386
7	35,750	\$32,050
8	3,741	\$4,645
9	311	\$238
10	3,822	\$3,215
11	13,566	\$14,404
12	17,126	\$21,316

Table 5: Percent monthly monkfish landings and revenue for 2020 – 2022 gillnet gear only that was within the southern New England proposed closure area.

Month	Pct Landings	Pct Revenue
1	0.312	0.312
2	0.103	0.104
3	0.087	0.102
4	0.110	0.120
5	0.665	0.620
6	0.726	0.683
7	0.475	0.460
8	0.093	0.113
9	0.007	0.006
10	0.096	0.080
11	0.292	0.220
12	0.333	0.265

Table 6: Average monthly monkfish landings and revenue for 2020 -2022 gillnet gear only and landing in New Jersey.

Month	Landed (lb)	Revenue
1	121,215	\$163,624
2	26,007	\$37,464
3	9,127	\$14,934
4	10,164	\$12,875
5	71,180	\$77,788
6	72,308	\$73,295
7		
8		
9		
10		
11	3,243	\$5,547
12	103,734	\$147,834

Table 7: Average monthly monkfish landings and revenue for 2020 - 2022 gillnet gear only that was within the New Jersey proposed closure area.

Month	Landed (lb)	Revenue
1	61,552	\$82,096
2	7,596	\$11,360
3	2,830	\$4,371
4	2,779	\$3,884
5	28,464	\$29,845
6	19,874	\$18,286
7		
8		
9		
10		
11	3,011	\$5,174
12	65,345	\$94,141

Table 8: Percent monthly monkfish landings and revenue for 2020 – 2022 gillnet gear only that was within the New Jersey proposed closure area.

Month	Pct Landings	Pct Revenue
1	0.508	0.502
2	0.292	0.303
3	0.310	0.293
4	0.273	0.302
5	0.400	0.384
6	0.275	0.249
7		
8		
9		
10		
11	0.928	0.933
12	0.630	0.637

Dogfish

Table 9: Average coastwide dogfish landings and revenue for 2020 -2022.

Month	Landed (lb)	Revenue
1	1,734,657	\$327,834
2	585,588	\$120,328
3	647,133	\$132,980
4	431,998	\$82,886
5	67,841	\$17,486
6	290,442	\$64,296
7	1,081,667	\$242,851
8	1,212,626	\$272,771
9	547,698	\$121,773
10	445,545	\$100,150
11	1,222,992	\$235,228
12	1,822,421	\$343,759

Table 10: Average coastwide dogfish landings and revenue for 2020- 2022 gillnet gear only.

Month	Landed (lb)	Revenue
1	1,710,056	\$322,930
2	571,155	\$114,539
3	619,550	\$125,040
4	388,235	\$75,403
5	39,235	\$12,385
6	281,863	\$62,313
7	1,065,809	\$238,280
8	1,203,293	\$270,235
9	536,731	\$118,962
10	424,307	\$95,954
11	1,139,388	\$219,467
12	1,762,033	\$329,268

Table 11: Average monthly dogfish landings and revenue for 2020 -2022 gillnet gear only and landing in New Jersey.

Month	Landed (lb)	Revenue
1		
2		
3	49,473	\$8,335
4	201,551	\$36,490
5	26,135	\$8,784
6		
7		
8		
9		
10	67,333	\$12,599
11	690,887	\$133,521
12	262,946	\$49,565

Table 12: Average monthly dogfish landings and revenue for 2020 -2022 gillnet gear only that was within the New Jersey proposed closure area.

Month	Landed (lb)	Revenue
1		
2		
3	26,650	\$4,808
4	125,942	\$22,838
5	12,847	\$3,894
6		
7		
8		
9		
10	36,695	\$6,829
11	380,811	\$73,154
12	185,485	\$34,833

Table 13: Percent monthly dogfish landings and revenue for 2020 – 2022 gillnet gear only that was within the NJ proposed closure area relative to total for NJ.

Month	Pct Landings	Pct Revenue
1		
2		
3	0.539	0.577
4	0.625	0.626
5	0.492	0.443
6		
7		
8		
9		
10	0.545	0.542
11	0.551	0.548
12	0.705	0.703

Table 14: Average monthly dogfish landings and revenue for 2020 - 2022 gillnet gear only and landing in Virginia and Maryland.

Month	Landed (lb)	Revenue
1	1,654,455	\$314,812
2	552,835	\$111,988
3	569,470	\$116,605
4	180,651	\$37,258
5		
6		
7		
8		
9		
10		
11	401,862	\$74,298
12	1,477,894	\$275,509

Table 15: Average monthly dogfish landings and revenue for 2020 - 2022 gillnet gear only that was within the Maryland-Virginia proposed closure area.

Month	Landed (lb)	Revenue
1	789,819	\$145,581
2	169,309	\$34,823
3	192,455	\$38,838
4	59,095	\$11,471
5		
6		
7		
8		
9		
10		
11	282,765	\$52,595
12	850,317	\$156,775

Table 16: Percent monthly dogfish landings and revenue for 2020 – 2022 gillnet gear only that was within the MD-VA proposed closure area.

Month	Pct Landings	Pct Revenue
1	0.477	0.462
2	0.306	0.311
3	0.338	0.333
4	0.327	0.308
5		
6		
7		
8		
9		
10		
11	0.704	0.708
12	0.575	0.569