



## Mid-Atlantic Fishery Management Council

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# MEMORANDUM

**Date:** August 29, 2022  
**To:** Council  
**From:** Julia Beaty, staff  
**Subject:** BOEM Draft Guidance for Mitigating Impacts to Commercial and Recreational Fisheries from Offshore Wind Energy Development

During the Council meeting on Wednesday August 10, 2022, staff from the Bureau of Ocean Energy Management (BOEM) will present draft guidance for mitigating impacts to commercial and recreational fisheries from offshore wind energy development.

BOEM is accepting comments on this draft guidance through August 22, 2022. Mid-Atlantic, New England, and South Atlantic Fishery Management Council staff are working on a joint comment letter. Mid-Atlantic Council staff will present a brief overview of draft comments during the August 10, 2022 Mid-Atlantic Council meeting.

The following documents are provided behind this tab.

1. Overview – Guidance for Mitigating Impacts to Commercial and Recreational Fisheries from Offshore Wind Energy Development.
2. Draft Guidelines for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR Part 585.
3. Appendix A. Data and Methodology for Developing Revenue Exposure Estimates in the Northeast Atlantic.

Although not part of this agenda item, the Council should also be aware that BOEM recently published a Notice of Intent to prepare a Programmatic Environmental Impact Statement to analyze potential impacts from offshore wind energy development activities in the six areas off New York and New Jersey which were leased earlier in 2022. Virtual public meetings will be held on August 2 and 4, 2022. A comment period is open through August 15, 2022. More information is available at <https://www.boem.gov/renewable-energy/state-activities/new-york-bight>.

# Bureau of Ocean Energy Management

## Overview – Guidance for Mitigating Impacts to Commercial and Recreational Fisheries from Offshore Wind Energy Development

*This document introduces and provides a high-level overview of BOEM's draft guidance for mitigating impacts to commercial and recreational fisheries from offshore wind development and the process to solicit input on the guidance development. The draft guidance is available for review on BOEM's website at <https://www.boem.gov/renewable-energy/request-information-reducing-or-avoiding-impacts-offshore-wind-energy-fisheries>.*

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The Bureau of Ocean Energy Management (BOEM), in consultation with the National Marine Fisheries Service (NMFS) and affected coastal States, developed draft guidance for the mitigation of impacts from offshore wind energy projects on commercial and recreational fishing communities. The guidance provides detailed processes and methodologies to the offshore wind industry and lessees to mitigate impacts to fisheries in the areas of project siting, design, navigation, access, safety, and financial compensation.

### Why is Fisheries Mitigation Guidance Needed?

**BOEM developed guidance to provide greater consistency between projects in mitigating impacts and for equitable treatment of commercial and recreational fisheries regardless of home or landing port.**

For its offshore renewable energy program, BOEM is taking a national level approach to mitigating the impacts to social and economic conditions of the fishing industry. As part of its process to approve plans to site renewable energy facilities and their components on the Outer Continental Shelf, BOEM requires information from the lessee on social and economic conditions, including “recreational and commercial fishing (including typical fishing seasons, location, and type),” that could be affected by a lessee’s proposed activities. This information assists BOEM in determining mitigation measures and complying with various regulations and laws prior to approving a lessee’s proposed plans. Complying with mitigation measures may be a condition of plan approval.

BOEM must consider potential impacts and mitigation measures on a project-by-project basis. While such an approach ensures an evaluation based upon the unique conditions affecting a project, it also creates risk for inconsistency across both projects and regions. BOEM and other regulators developed this guidance to reduce the likelihood of inconsistencies in compensatory mitigation that could not be explained by unique, local conditions.

### Overview of the Guidance Development Process

**BOEM issued a request for information in late 2021 and conducted a 45-day public comment period to obtain input on what to include in the fisheries mitigation guidance.**

During the comment period, BOEM hosted seven, 2-hour workshops to present the process for developing draft guidance to key stakeholders, answer questions, provide information on how to submit comments during the public comment process, and receive comments on key issues. BOEM also invited written comments via regulations.gov and by mail.

Over the course of the comment period, 95 individuals provided oral comments, and 95 individuals and organizations submitted written comments. BOEM also convened the Northeast Fisheries Compensatory Mitigation Data and Methodologies Technical Working Group (TWG) to exchange facts and information around fisheries compensatory mitigation as part of the draft guidance development. The TWG comprised representatives from Federal and State coastal management agencies, including BOEM, NMFS, the Greater Atlantic Regional Fisheries Office, the Northeast Fisheries Science Center, and relevant agencies from Maine, Massachusetts, Rhode Island, New York, New Jersey, and Virginia. To accomplish the goal of building consensus amongst parties and to comply with the Federal Committee Advisory Act (FACA), TWG membership was limited to State and Federal government employees, but the group invited technical speakers from academia, consulting firms, and associations to present information and answer TWG queries. Despite FACA, the TWG acknowledged the limitations of not having fishing industry members in the working group.

## Guidance Overview

The guidance outlines measures to potentially mitigate the impacts of a proposed project to commercial and recreational fisheries. Key measures include a recommendation that the lessee use existing tools to identify commercial and recreational fishing communities to engage and then engage with them prior to any activity on the lease itself. BOEM encourages the lessee to respect and record the views of the fishing communities in these meetings and to develop a publicly available document that describes the substance of those interactions as well as how the lessee will or will not adopt mitigation measures identified by the fishing communities.

The draft guidance provides recommendations related to project siting, design, navigation, access, safety measures, and financial compensation.

- **Project siting, design, navigation, and access:** Possible design considerations for the wind turbine foundations, mooring systems (if applicable), inter-array cable, and export cables should be built into the process through consultation with fisheries stakeholders. BOEM recognizes that there is not a standard facility design that will mitigate potential impacts to all fisheries in all regions, but the guidance outlines design elements to consider.
- **Safety:** BOEM recommends that the lessee consider incorporating safety measures in their plans regarding facility charting and marking, minimizing disruption to fishing activities during construction, monitoring, providing training on safe operations within a facility, and employing the commercial fishing industry as safety liaison vessels during construction, and upgrading automatic identification systems on vessels engaged in offshore wind energy activities.
- **Financial compensation:** BOEM's guidance document recommends that the lessee consider establishing a process to compensate commercial and recreational fisheries if a project is likely to result

in lost income to commercial and recreational fishing industries. The scope of impacts or losses addressed by compensatory mitigation should be based on the impacts identified in the lessee's plans and assessments where the lessee has analyzed the potential effects of its actions. BOEM recommends that compensation extend through the construction, operations, and decommissioning phases of a development.

### What BOEM's Guidance Can Do

- Recommend fisheries mitigation processes (including processes for filing claims and timing of initial mitigation plan proposals).
- Recommend methodology to determine the sufficiency of funds to compensate fishing communities for negative economic impacts arising from offshore wind energy development activities approved by BOEM.
- Propose measures that could result in fair, equitable, and predictable methodologies used by developers for mitigating impacts of offshore wind energy on fishing communities.
- Enforce compliance with contributions proposed by the lessee that were part of the approved plan or other appropriate plan approval, whether or not such contributions are required by a State.

### What BOEM's Guidance Can't Do

- Create a central fund. BOEM lacks legal authority to create or oversee a central funding mechanism for compensatory mitigation. BOEM also lacks authority to require contributions to a particular compensation fund, absent a previous commitment or obligation for the lessee to do so.
- Administer funds. BOEM lacks the legal authority to receive or hold funds or to assess industry fees for mitigation.
- Require regional mitigation. BOEM cannot require a lessee to mitigate regional impacts as part of a plan approval, unless BOEM's environmental impact analysis demonstrates the regional impacts of the specific project.

### Where to Find More Information

The draft fisheries mitigation guidance is being shared with the public for review and input for a 45-day comment period. Guidelines developed through this process may be updated periodically based upon public feedback and evaluation by BOEM staff.

The draft guidance, background information, comments received during the public comment period, and ways to comment are available here: <https://www.boem.gov/renewable-energy/request-information-reducing-or-avoiding-impacts-offshore-wind-energy-fisheries>

**UNITED STATES DEPARTMENT OF THE INTERIOR**  
**Bureau of Ocean Energy Management**  
**Office of Renewable Energy Programs**

**June 23, 2022**

**Guidelines for Mitigating Impacts to Commercial and Recreational Fisheries on  
the Outer Continental Shelf Pursuant to 30 CFR Part 585**

**Guidance Disclaimer**

Except to the extent that the contents of this document derive from requirements established by statute, regulation, lease, contract, or other binding legal authority, the contents of this document do not have the force and effect of law and are not meant to bind the public in any way. This document is intended only to provide clarity to the public regarding legal requirements, related agency policies, and technical issues.

**I. Introduction to Guidelines**

As part of its approval of plans for the siting of renewable energy facilities and their components<sup>1</sup> on the Outer Continental Shelf (OCS), the U.S. Department of the Interior, Bureau of Ocean Energy Management (BOEM) requires lessees to submit information on social and economic conditions, including “recreational and commercial fishing (including typical fishing seasons, location, and type)” that could be affected by the lessee’s proposed activities (see: 30 CFR 585.611(b)(7) for a Site Assessment Plan (SAP); 30 CFR 585.627(a)(7) for a Construction and Operations Plan (COP); and 30 CFR 585.646(b)(7) for a General Activities Plan (GAP)). In Addition, 30 CFR 585.610(a)(8) and 585.626(b)(15) requires that the SAP and COP, respectively, include project-specific information, including proposed mitigation measures for avoiding, minimizing, reducing, eliminating, and monitoring environmental impacts.

The information required in the regulations assists BOEM in complying with the Outer Continental Shelf Lands Act (OCSLA) (43 U.S.C. § 1337p), the National Environmental Policy Act (NEPA) and other relevant laws. Failure to submit the necessary information in a SAP, COP, or GAP may result in delay, disapproval of a plan, or approval of a plan with additional terms and conditions. See also 30 C.F.R. 585.633(a), 585.633(b)(2), and 585.628(f).

Between 2013 and 2014, BOEM held a series of workshops from Maine to North Carolina to identify best management practices (BMP) and mitigation measures to reduce

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<sup>1</sup> See definition of “Facility” in 30 C.F.R. 585.112

potential impacts to commercial and recreational fisheries.<sup>2</sup> These workshops resulted in five BMP areas:

1. Fisheries communication and outreach
2. Project siting, design, navigation, and access
3. Safety
4. Environmental monitoring
5. Financial compensation

BOEM issued guidance on fisheries communication and outreach in an October 20, 2015, document entitled, *Guidelines for Providing Information on Fisheries Social and Economic Conditions for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585*<sup>3</sup>. These guidelines were modified and reissued on May 27, 2020.

The guidelines in this document discuss the remaining BMPs and provide suggestions for complying with information requirements in the regulatory provisions listed above. These guidelines may be updated periodically based upon public feedback and evaluation by BOEM staff.

## **II. Authority and Regulations**

Under subsection 8(p)(4) of OCSLA, BOEM must ensure that any activity under this subsection is carried out in a manner that provides for, among other goals, safety, protection of the environment, conservation of the natural resources of the OCS, prevention of interference with reasonable uses (as determined by the Secretary) of the [U.S.] exclusive economic zone, the high seas, and the territorial seas, and consideration of any other use of the sea or seabed, including use for a fishery. BOEM also has statutory obligations under NEPA (42 U.S.C. §§ 4321 *et seq.*) to evaluate social and economic impacts of a potential project. Under BOEM's regulations, BOEM must coordinate with relevant Federal agencies, including those agencies involved in planning activities that are undertaken to avoid conflicts among users and to maximize the economic and ecological benefits of the OCS (30 CFR 585.102(a)(5)).

For BOEM to evaluate potential impacts to social and economic conditions of the fishing industry, a lessee's SAP, COP, or GAP should provide the necessary information to assist BOEM in determining whether the proposed activities could result in unreasonable interference with other uses of the OCS or could cause undue harm to the environment (see 30 CFR 585.606, 621, 641). Also, the lessee's plans should provide proposed measures for avoiding, minimizing, reducing, eliminating, and monitoring environmental impacts (see 30 CFR 585.610(a)(8) and 626(b)(15)). BOEM will review the submitted SAP, COP, or GAP and any relevant supporting information to determine if the plan contains the information necessary to conduct BOEM's technical and environmental reviews. Upon

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<sup>2</sup> "Development of Mitigation Measures to Address Potential Use Conflicts between Commercial Wind Energy Lessees/Grantees and Commercial Fishermen on the Atlantic Outer Continental Shelf" (Ecology and Environment, Inc. 2014), available at <http://www.boem.gov/OCS-Study-BOEM-2014-654/>.

<sup>3</sup> <https://www.boem.gov/Social-and-Economic-Conditions-Fishery-Communication-Guidelines/>

completion of BOEM’s technical and environmental reviews and other reviews required by Federal laws, BOEM may approve, disapprove, or approve with modifications the lessee’s SAP, COP, or GAP.

Relevant regulatory provisions for lessees within 30 CFR Part 585 Subpart F include the following:

	<b>Information Requirement</b>	<b>Type of Plan</b>	<b>Regulatory Citation</b>
1.	Your plans must demonstrate that you have planned and are prepared to conduct the proposed activities in a manner that does not unreasonably interfere with other uses of the OCS and uses best management practices.	SAP, COP, and GAP	30 CFR 585.606(a)(3) & (6) (SAP); 30 CFR 585.621(c) & (f) (COP); and 30 CFR 585.641(c) & (f) (GAP).
2.	You must submit with your plans a list of agencies and persons with whom you have communicated, or with whom you will communicate, regarding potential impacts associated with you proposed activities. This description must contain the contact information and the issues discussed.	SAP, COP, and GAP	30 CFR 585.610(a)(13) (SAP), 30 CFR 585.626(b)(17) (COP), 30 CFR 585.645(b)(14) (GAP)
3.	You must submit additional information requested by BOEM.	SAP, COP, and GAP	30 CFR 585.610(a) (16) (SAP), 30 CFR 585.626(b)(23) (COP), and 30 CFR 585.645(b)(16) (GAP)
4.	You must provide a description of the social and economic conditions of commercial and recreational fisheries that could be affected by the activities proposed in the plan.	SAP, COP, and GAP	30 CFR 585.611(b)(7) (SAP); 30 CFR 585.627(a)(7) (COP); and 30 CFR 585.646(b)(7) (GAP)
5.	BOEM may require additional information during the review of the plans and failure to provide the information may result in the disapproval of the plan.	SAP, COP, and GAP	30 CFR 585.613(d) (SAP); 30 CFR 585.628(e) (COP); 30 CFR 585.648(d) (GAP)
6.	You must provide proposed measures for avoiding, minimizing, reducing, eliminating, and monitoring environmental impacts	SAP, COP	30 CFR 585.610(a)(8) 30 CFR 585.626(b)(15)

Some of the actions described in these guidelines may be required for lessees under the terms and conditions of a specific lease or grant. A lease or grant may also have requirements for lessees that differ from or add to regulatory requirements and

recommendations discussed in these guidelines. To the extent that there is a conflict between the terms of the lease or grant and these guidelines, the terms of the lease or grant would control. If there is a conflict between the lease or grant and the applicable regulations the regulations would control.

### **Recommended Practices for Mitigating Impacts to Commercial and Recreational Fisheries**

Per the Council of Environmental Quality (CEQ) regulations (40 CFR 1508.1(s)), mitigation includes:

1. Avoiding the impact altogether by not taking a certain action or parts of an action.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
5. Compensating for the impact by replacing or providing substitute resources or environments.

The following measures may mitigate the impacts of a proposed project, as identified in environmental analyses and public feedback, to commercial and recreational fisheries. These measures may work in tandem with additional mitigation measures that are directed at the overall health of a fishery or community (e.g., marketing/seafood promotion initiatives, gear development, and support programs that ensure safe and profitable fishing alongside offshore wind energy development).

#### **A. General Approach to Developing Mitigation Measures**

As reflected in the *Guidelines for Providing Information on Fisheries Social and Economic Conditions for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585*, BOEM recommends that the lessee engage with commercial and recreational fishing communities prior to engaging in any activity in support of a plan. Several planning tools may help lessees identify communities to engage including the NOAA and BOEM Ocean Reports tool, the Northeast Region Ocean Council's (NROC) Northeast Data Portal, the Mid-Atlantic Region Council on the Ocean's (MARCO) Mid-Atlantic Data Portal, the South Atlantic Fish Management Council (SAFMC) Digital Dashboard in the Atlantic, the Gulf of Mexico Alliance in the Gulf, the California Offshore Wind Energy Gateway, and the Oregon Offshore Wind Mapping Tool (OROWindMap) on the Pacific Coast. In some cases, additional community outreach may be necessary to identify potentially affected communities.

This pre-activity engagement should be respectful of the views of the fishing communities consulted. The engagement should result in a public document describing the nature of the engagement and how the lessee has addressed the measures identified by the fishing communities to mitigate the impacts of the proposed activity. The intent of this



recommendation is to improve lessee communication, transparency, and accountability with fishing communities that may be impacted by a project's OCS activities. As a result the lessee's project design should reflect the current and future uses of the project area and mitigate potential adverse effects if necessary. The lessee should make reasonable efforts to implement the project in a manner that minimizes, mitigates, or redresses any adverse project effects on commercial and recreational fisheries. Early engagement with fishing communities can promote equity and encourage participation in the development of mitigation plans for the entire fishing community.

## **B. Project Siting, Design, Navigation, and Access**

As described in section A above, BOEM recommends that offshore wind lessees meet with commercial and recreational fishing groups at the earliest stages of the facility design process. These meetings should occur before a lessee conducts site-specific data collection surveys to best account for design considerations relating to the wind turbine foundations, mooring systems (if applicable), inter-array cable, and export cables. BOEM recognizes that there is not a standard facility design that will mitigate potential impacts to all fisheries in all regions. However, the lessee should consider design elements described below in consultation with fisheries stakeholders.

Recommended static cable design elements:

1. All static cables should be buried to a minimum depth of 6 feet below the seabed where technically feasible. Technical feasibility constraints include seabed conditions that preclude burial, such as telecommunication cable crossings.
2. Lessees should avoid installation techniques that raise the profile of the seabed, such as the ejection of large, previously buried rocks or boulders onto the surface. The ejection of this material may damage fishing gear.
3. If needed, cable protection measures should reflect the pre-existing conditions at the site. This mitigation measure chiefly ensures that seafloor cable protection does not introduce new obstructions for mobile fishing gear. Thus, the cable protection measures should be trawl-friendly with tapered or sloped edges. If cable protection is necessary in "non-trawlable" habitat, such as rocky habitat, then the lessee should consider using materials that mirror the benthic environment.

Recommended dynamic cable design elements:

1. Dynamic cables should be suspended at a depth that minimizes interactions with fishing operations.
2. Where feasible, cables should share corridors and minimize the total cable footprint.

Recommended facility design elements:

1. The facility design should maximize access to fisheries, including by consideration of:
  - a. Transit within the project area and traditional fishing activities within the project area.
  - b. Consolidation of infrastructure, where practicable, to reduce space-use conflicts.

- c. Consideration of larger turbine sizes to reduce total project footprint and meet energy production commitments.
  - d. Coordination of turbine and substation array layouts between and among neighboring lease areas to allow safe fishing operations and transit through multiple projects. In instances where layout design cannot accommodate two common lines of orientation across adjacent leases, the lessee should consider incorporating a 1 nautical mile setback, within which no surface structures may be constructed. See Navigation and Vessel Inspection Circular 10-19<sup>4</sup> for more details.
2. Turbine locations should be sited to avoid known sensitive benthic features, such as natural and artificial reefs.
  3. Facility planning should use nature inclusive designs<sup>5</sup>, where applicable, to maximize available habitat for fish.

### C. Safety Measures

To improve safety at sea in and around offshore wind facilities, BOEM recommends that lessees consider the following measures in their plan submittals.

1. Charting all facilities and obstructions resulting from construction and operations of an offshore wind energy facility and providing that information to NOAA, U.S. Coast Guard (USCG), and navigational software companies.
2. Considering installation techniques and time windows that minimize disruption to fishing activities (e.g., simultaneous lay and burial, or conducting activity during the appropriate time of year).
3. Employing liaisons from the commercial fishing industry to provide safety and communication services during construction.
4. Monitoring cable burial in real-time and report all potential hazard events to the USCG as soon as possible.
5. Using digital information technology platforms (e.g., smartphone applications) to bring together survey and construction schedules and locations in addition to standard local notices to mariners via the USCG.
6. Marking facilities and appurtenances with permanent identification of the project and company.
7. Providing training opportunities for the commercial fishing industry to simulate safe navigation through a wind facility in various weather conditions and at various speeds.
8. Monitoring safety threats (e.g., radar disruption, ice shedding, vessel allisions and collisions, security threats, and impacts on search and rescue efforts) throughout the life of a project.
9. Consulting with the fishing industry and the USCG to identify which structures would be most appropriate for Automatic Identification System (AIS) transponders

<sup>4</sup> <https://www.dco.uscg.mil/Our-Organization/NVIC/>

<sup>5</sup> See “Evaluating the Effectiveness of Nature Inclusive Design Materials” here:

[https://www.boem.gov/sites/default/files/documents/environment/environmental-studies/SDP\\_2022-2023.pdf](https://www.boem.gov/sites/default/files/documents/environment/environmental-studies/SDP_2022-2023.pdf)

consistent with BOEM's Lighting and Marking Guidelines<sup>6</sup>.

10. Considering lessee-funded radar system upgrades for commercial and for-hire recreational fishing vessels (e.g. solid state Doppler-based marine vessel radar systems<sup>7</sup>).

#### **D. Environmental Monitoring**

BOEM recommends that lessees work with State and Federal fisheries management agencies to explore the need and methods to monitor changes in fishing activity as a result of proposed offshore wind energy development. Separately, BOEM provides recommendations for conducting and reporting the results of baseline collection studies in separate guidelines: <https://www.boem.gov/Survey-Guidelines/>. In 2021 the Responsible Offshore Science Alliance ([rosascience.org](https://www.rosascience.org)) worked with State, Federal, and fisheries constituents to develop the Offshore Wind Monitoring Framework and Guidelines document ([https://www.rosascience.org/\\_files/ugd/99421e\\_b8932042e6e140ee84c5f8531c2530ab.pdf](https://www.rosascience.org/_files/ugd/99421e_b8932042e6e140ee84c5f8531c2530ab.pdf)). This document is an important resource in understanding necessary considerations in developing pre-construction, construction, and post-construction fisheries monitoring surveys.

#### **E. Financial Compensation**

##### General Approach

BOEM recommends that the lessee consider establishing a compensation process if a project is likely to result in lost income to commercial and recreational fisheries. The compensation process should be equitable and fair across fisheries and fishing communities and consider best practices and consistency across other offshore wind energy projects. The scope of impacts or losses that should be addressed by compensatory mitigation should be based on the impacts identified in the various environmental documents including the lessee's COP and BOEM's assessments analyzing the potential effects of the lessee's submitted plans. BOEM recommends that a lessee accept valid claims from fishing interests (see Eligible Entities below).

##### Compensation for Gear Loss and Damage

BOEM recommends following the minimum standards for gear loss that exist for the Fisheries Contingency Fund (FCF) claims process<sup>8</sup>. The lessee should consider reimbursements for fisheries gear loss and damage resulting from lessee's actions (e.g., a lessee-contracted survey vessel damaging fishing gear during survey operations). The lessee should also consider compensation for damaged gear resulting from interactions between the fishing industry and non-marked and/or non-charted obstructions that are the property of the lessee. A lessee may elect to reimburse damage to fishing gear from marked and charted obstructions in order to limit interactions with lessee property. The

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<sup>6</sup> <https://www.boem.gov/sites/default/files/documents/renewable-energy/2021-Lighting-and-Marking-Guidelines.pdf>

<sup>7</sup> National Academies of Science Engineering and Medicine. 2022. *Wind Turbine Generator Impacts to Marine Vessel Radar*. Washington, D.C.: The National Academies Press. <https://doi.org/10.17226/26430>.

<sup>8</sup> <https://www.fisheries.noaa.gov/national/funding-and-financial-services/fishermens-contingency-fund-program>

lessee should review claims filed within 90 days after the date of first discovery of the incident. The lessee should consider fully compensating for the repair or replacement of the damaged gear and up to 50-percent of gross income loss during the period from the discovery of the lost or damaged gear to when the gear is repaired or replaced. The lessee should also consider compensating for reasonable fees paid to an attorney, certified public accountant, or other consultant for the preparation of the claim.

#### Compensation for Lost Fishing Income

BOEM recommends the following minimum standards when determining compensation for lost fishing income. The lessee should consider establishing adequate reserve funds (see below) to compensate for lost income as a direct result of the lessee's actions.

### **Determining Adequate Reserve Funds for Compensation**

#### Revenue Exposure

In the U.S. offshore energy sector, claims for financial loss by fisheries have primarily focused on claims associated with lost gear and income associated with actual interactions between fishing gear and property of offshore energy companies. There are no existing Federal policies or laws explicitly and specifically requiring compensation of economic loss from displacement attributed to offshore energy installations. Thus, there is a no history of claims for such loss that might be referenced to determine adequate reserve funds for such compensation. BOEM recommends that lessees consider using fishing revenue exposure (i.e., the amount of ex-vessel revenue<sup>9</sup> generated from the project area of potential displacement) for the purposes of determining the value of reserve funds to set aside for compensation.

As a general matter, BOEM considers the following to be a reasonable definition of revenue exposure: the total ex-vessel value of the fish landed, usually presented in an annualized format. This measurement is not the direct estimate of net income loss (revenue exposure minus expenses) to the business, nor representative of the actual duration for which an impact may have occurred. Under this definition, BOEM generally expects that lost income is a portion of the total revenue exposure. In many cases this over-estimation, if utilized by the lessee, is likely to be sufficient to cover shoreside income loss and potentially under-reported landings (See Appendix A for more discussion of shoreside revenue estimation). However, in some localities it may be appropriate to apply a multiplier (previous projects estimated at approximately 1-2 percent) to the total revenue exposure to ensure that shoreside income loss is adequately covered (See Appendix A for more details on appropriate multipliers in the northeast United States). Similarly, some localities may have a sector of fishing activity for which accurate revenue exposure data is unavailable. In those cases, the lessee should consider developing an additional multiplier for the missing information to ensure the adequacy of compensation funds. Revenue exposure analyses included in plans should use the GDP Implicit Price Deflator for standardizing dollar amounts across years. The GDP Implicit Price Deflator is also the standard used by NMFS in fisheries management analyses.

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<sup>9</sup> A measure of the dollar value of commercial landings, usually calculated as the price per pound at first purchase of the commercial landings multiplied by the total pounds landed. (NOAA Sustainable Fisheries Glossary)

## **Duration of Compensatory Mitigation Period**

### Construction

For purposes of determining voluntary compensation for losses to commercial and recreational fisheries, lessees should consider the proportion of the project area that is rendered unavailable to fishing during active construction on the OCS and should specifically consider whether the entirety of the project area is unavailable. In that event, lessees should consider compensation for lost income for the duration of foundation and submarine cable installation where exclusion from fishing grounds is necessary for safety or for the activity that has resulted in the behavior of target fish species such that they are no longer available to the fishery (e.g., where the fish are not biting at hooks during elevated acoustic exposure).

### Operations

As discussed above, the scope of impacts or losses addressed by compensatory mitigation should be based on the impacts identified in various environmental documents analyzing the potential effects of the action proposed in the lessee's submitted plans. Generally, and as a minimum standard it should be assumed that there is an adjustment period for fisheries post construction. BOEM recommends that, at minimum, lessees consider the following payment structure be available for claimants: 100 percent of revenue exposure for the first year after construction, 80 percent of revenue exposure 2 years after construction, 70 percent of revenue exposure 3 years after construction, 60 percent after four years, and 50 percent after five years post construction. Compensatory mitigation beyond 5 years post-construction may be necessary and should be evaluated based on the activities proposed in the COP.

### Decommissioning

Since BOEM evaluates only conceptual decommissioning during COP approval, BOEM recommends that the lessee's decommissioning application required under 30 CFR 585.906 include the measures to mitigate impacts to commercial and recreational fishing. In general, the same principles as described under construction, above, should apply.

### Management of Funds

BOEM recommends that lessees consider contracting with a neutral third-party to process claims, manage, and disburse funds, and handle appeals. Funds may be established at the project level, company level (multiple projects), or regional multi-lessee level.

### Eligible Entities

Lessees should consider the propriety of permitting claims from entities other than vessel owners, operators, and crew including shoreside businesses, such as seafood processors and bait dealers, that can demonstrate in a claim that their business experienced a loss of income due to unrecovered economic activity resulting from displaced fisheries. Lessees may consider a pre-application process to identify all eligible entities as early in the compensation development process as practicable. This pre-application process could facilitate more efficient claims processing.

### Claims Process

As described above, BOEM recommends lessees establish a neutral third party to administer mitigation funds, process claims, and handle appeals or adjustments. The lessee or the neutral third party should honor verified claims from eligible entities as described above. A variety of compensation models may mitigate project impacts, including programs that provide funds more directly to an impacted community to improve overall financial health of the fishing community for disbursement by community members, as mentioned in the introduction. However, BOEM's suggested model is based on individual claims and directs funds to impacted businesses. This mechanism ensures that claims are commensurate with the impacts to the claimant rather than pooled into a more general fund that may benefit the fishing industry more broadly.

Claims should be honored for up to 2 years after the income loss was experienced. Income loss due to displacement might not be realized until the end of a fishing season, or able to be substantiated until State or Federal landings records are made publicly available, thus necessitating a longer period for the claim to be submitted.

The lessee should consider establishing a claims appeal or adjustment process. Appeals or adjustment claims should be considered if filed within 6 months of the original decision on the claim. BOEM recommends that lessees or its neutral party consider paying validated claims within 1 month of receipt of a complete claim. BOEM encourages lessees to make any claims process as simple as possible and to accommodate a variety of different business records.

### **Review of Information Resources**

In developing a fisheries mitigation plan, lessees may find the following information helpful:

- Ecology and Environment, Inc. 2014. Development of Mitigation Measures to Address Potential Use Conflicts between Commercial Wind Energy Lessees/Grantees and Commercial Fishermen on the Atlantic Outer Continental Shelf Report on Best Management Practices and Mitigation Measures. A final report for the U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewal Energy Programs, Herndon, VA. OCS Study BOEM 2014-654. Available at <http://www.boem.gov/OCS-Study-BOEM-2014-654>.
- National Marine Fisheries Service's (NMFS) Office of Science and Technology, provides a baseline understanding of fishery social and economic conditions which is available at <https://www.st.nmfs.noaa.gov>. Their Human Dimensions Program maintains community profiles, social indicators, and social and cultural studies.
- In 2015, BOEM and NMFS completed an assessment of fisheries revenue from BOEM's wind energy areas and potential impacts from fishing disruption in those

areas. This report, published in February 2017 and entitled “Socio-Economic Impact of Outer Continental Shelf Wind Energy Development on Fisheries in the U.S. Atlantic,” is posted on BOEM’s renewable energy study webpage: <http://www.boem.gov/Renewable-Energy-Completed-Studies/>.

### **BOEM Guidance Document Statement**

This guidance document sets forth BOEM’s general policy to provide the public with additional information regarding the agency’s approach to managing its renewable energy program. This guidance does not have the force and effect of law and does not bind the public or BOEM in any way. Lessees are encouraged to contact BOEM with questions or concerns related to the guidance or to site-specific permitting.

### **Paperwork Reduction Act Statement**

These guidelines provide clarification, description, or interpretation of requirements contained in 30 CFR 585, Subpart F. An agency may not conduct or sponsor a collection of information unless it displays a currently valid OMB Control Number. OMB has approved the information collection requirements in the 30 CFR 585, Subpart F regulations under OMB Control Number 1010-0176. These guidelines do not impose additional information collection requirements subject to the Paperwork Reduction Act of 1995.

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**Appendix A. Data and Methodology for Developing Compensatory Mitigation in  
the Northeast Atlantic**

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## **Appendix A. Data and Methodology for Developing Revenue Exposure Estimates in the Northeast Atlantic**

This appendix has been developed to specifically aid lessees with offshore wind energy leases in the Northeast Atlantic, from Cape Hatteras to the Gulf of Maine, to develop revenue exposure estimates for compensatory mitigation of lost income to fisheries as a result of offshore wind energy development. The datasets discussed are exclusive to Northeast states and the National Marine Fisheries Service (NMFS) Greater Atlantic Regional Fisheries Office (GARFO). Guidance for revenue exposure data and methodologies for other regions may be developed at a later time.

BOEM has developed this guidance in consultation with state and Federal partners, including the National Marine Fisheries Service. However, this guidance is wholly the product of BOEM. Fisheries science and identification of past, current, and future fishing activity in the northeast, is highly dynamic and influenced by several factors, including but not limited to fisheries management, market conditions, potential biological impacts from offshore wind development, and changing conditions brought about by climate change. Thus, data representing fishing operations are inherently variable and complex, increasing the uncertainty when evaluating economic exposure and potential compensation estimates for individual wind energy projects.

### **Commercial Fisheries**

As discussed in the National guidance, BOEM recommends that analyses of fisheries compensation plans begin with assessing the revenue exposure of actions proposed in the COP that may disrupt or displace fishing activity. Revenue exposure is the total amount of fishery revenue generated within a defined area (e.g., an offshore wind energy project area) and based on historical data that could be foregone if vessel operators no longer fish within that area due to offshore wind energy construction and operation activity. In the northeast U.S., the primary means of determining revenue exposure is from the NMFS/GARFO fishery footprint and related socioeconomic impacts of Atlantic offshore wind development (see link in Table 1 below). BOEM believes there is a high degree of confidence in revenue exposure for those derived data products for the following fisheries<sup>1</sup>:

- Atlantic Herring
- Bluefish
- Golden Tilefish
- Mackerel/Squid/Butterfish
- Monkfish

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<sup>1</sup> A full glossary of fisheries terms used in this appendix is found here:  
<https://repository.library.noaa.gov/view/noaa/12856>

- Multispecies Large Mesh (American plaice, Atlantic cod, Atlantic halibut, Atlantic wolffish, Haddock, Ocean pout, Offshore hake, Pollock, Redfish, Red hake, Silver hake (whiting), White hake, Windowpane flounder, Winter flounder, Witch flounder, Yellowtail flounder)
- Multispecies Small Mesh (silver hake, offshore hake, and red hake)
- Red Crab
- Sea Scallop
- Skate
- Spiny Dogfish
- Summer Flounder/Scup/Black Sea Bass
- Surfclam/Ocean Quahog

While NMFS reports other species in its fishery revenue exposure data product, the ones listed above are the most complete and accurate. It is the responsibility of the lessee to ensure that the spatial footprint available on the NMFS webpage accurately reflects the proposed action in the lessees' COP. If the information is not correct the lessee should work with BOEM and NMFS to request an analysis based on the proposed action. Data requests should include all years of data from 2008 up to the current available year be used to calculate the annualized revenue exposure. This request should occur prior to the COP being submitted to BOEM. Considerations for "data-limited" species and recreational fishing are described separately below.

While the revenue exposure calculations are a great resource, BOEM recommends that lessees also evaluate data derived from vessel monitoring systems to better understand finer scale vessel activity, annual variation in fishing activity, and transit routes to fishing locations.

Within the NMFS/GARFO region, individual federal Fishery Management Plans (FMP) required federal permit holders to use VMS over time. The following list includes the year in which each FMP required federally permitted vessels to begin using VMS. There are publicly available VMS data products listed in Table 1 below.

- Monkfish: optional and elective on a yearly basis
- Atlantic Herring: 2005
- Northeast Multispecies (groundfish): 2006
- Atlantic Scallops: 2006
- Surfclam/Ocean quahogs: 2008
- Atlantic Mackerel: 2014
- Longfin Squid/Butterfish: 2016
- Illex Squid: 2017

It should be noted that there are some limitations to VMS. Not all federal FMPs require VMS and some fisheries are not covered by VMS at all (note what is covered above). If a vessel is

issued a permit in another federal FMP that requires VMS, trips taken in non-VMS fisheries are mostly represented by a “DOF-COM” VMS trip declaration (e.g., a commercial fishing trip that is declared out of an FMP managed by days-at-sea effort controls). This activity cannot be assigned to a specific FMP or target species (e.g., summer flounder) unless each trip is corroborated with a VTR or other reported information. Additionally, a vessel can “target” one species and catch another—even in greater amounts—on any trip, limiting the utility of VMS trip declarations of vessel intent. Data from VMS can be difficult to link to dealer reports. Other limitations to VMS are related to assumptions used when analyzing the data. Fishing time/location can be misestimated by operational assumptions (speed and direction) that are affected by externalities (weather, sea state, mechanical issues) and fishing practices (e.g., drifting to repair gear, sort/shuck catch, and store product). Further, differentiating harvesting activity from vessel transit must be inferred using vessel speed and course adjustment, while vessel speed and different position ping rates (30-60 minutes) can limit the area. Vessel course changes can be influenced by several factors. Harvesting speeds vary by fishery, and transiting speed depends on the vessel, weather, sea state, and other factors.

<b>Table 1. Derived Fishery Revenue Exposure Products</b>	
<b>Derived Fishery Revenue Exposure Products</b>	
<b>SOURCE</b>	<b>TITLE</b>
NOAA NMFS	Fishing Footprints for the New England/Mid-Atlantic Region, <a href="https://apps-nefsc.fisheries.noaa.gov/read/socialsci/fishing-footprints.php">https://apps-nefsc.fisheries.noaa.gov/read/socialsci/fishing-footprints.php</a>
NOAA NMFS	Socioeconomic Impacts of Atlantic Offshore Wind Development, <a href="https://www.fisheries.noaa.gov/resource/data/socioeconomic-impacts-atlantic-offshore-wind-development?utm_medium=email&amp;utm_source=govdelivery">https://www.fisheries.noaa.gov/resource/data/socioeconomic-impacts-atlantic-offshore-wind-development?utm_medium=email&amp;utm_source=govdelivery</a>
BOEM	<i>Socio-Economic Impact of Outer Continental Shelf Wind Energy Development on Fisheries in the U.S. Atlantic: OCS Study BOEM 2017-012</i> , Kirkpatrick, et.al. <sup>2</sup> , <a href="https://espis.boem.gov/final%20reports/5580.pdf">https://espis.boem.gov/final%20reports/5580.pdf</a>
RIDEM (2017)	Spatiotemporal and economic analysis of vessel monitoring system data within wind energy areas in the greater North Atlantic, <a href="http://www.crmc.ri.gov/windenergy/vineyardwind/VW_EconExposureCommFisheries.pdf">http://www.crmc.ri.gov/windenergy/vineyardwind/VW_EconExposureCommFisheries.pdf</a>
RIDEM (2018)	Addendum: Spatiotemporal and economic analysis of vessel monitoring system data within wind energy areas in the greater North Atlantic, <a href="http://www.crmc.ri.gov/windenergy/vineyardwind/RIDEM_VWFishValue_20190114.pdf">http://www.crmc.ri.gov/windenergy/vineyardwind/RIDEM_VWFishValue_20190114.pdf</a>
<b>Original Fishery Data Sources</b>	
NOAA/NMFS	Vessel Monitoring System data (aggregated data available on NROC and MARCO data portals, trip level data not publicly available)
NOAA/NMFS	Federal fishing vessel trip reports and dealer reports
ASMFC	Atlantic Coastal Cooperative Statistics Program (public data warehouse accessible via sign up)

<sup>2</sup> Please note that this study is similar to the NMFS Fishing Footprints product, but its methodology is different and would require significant additional work for what NMFS is able to do currently in its Footprints product.

## **Data-Limited Commercial Fisheries**

There are several species where there are substantial limitations to existing data sets for calculating revenue exposure. These data-limited species include, but are not limited to, American lobster, Jonah crab, whelk, Atlantic menhaden, Atlantic croaker, and highly migratory species (HMS). These species may be captured in the NMFS/GARFO fishery footprint data sets, however, they may not fully represent the actual revenue exposure for that fishery. For example, species like whelk/conch, horseshoe crab, and tautog are likely to have less than 50% of their landings captured in the NMFS/GARFO fishery footprint dataset. Species like Jonah crab and lobster may have good representation in the NMFS/GARFO data in Southern New England but less so for inshore areas in the Gulf of Maine. The lessee is advised to evaluate data sources including fisheries stock assessments, Atlantic Coastal Cooperative Statistics Program (ACCSP), federal and state fishery independent and dependent surveys, industry owned data and knowledge (that ensures proper use of proprietary information e.g., Fisheries Knowledge Trust), and/or high-resolution bathymetry/habitat mapping. From this information, it is possible to apply a multiplier based on what is in the NMFS/GARFO data and what is captured in other data sources. This concept is visualized in Figure A2 of Attachment 1, which provides an estimate of representativeness of NMFS/GARFO VTR landings data when compared to total landings. Attachment 1 to this Appendix describes the limits of some of these species. Ultimately, BOEM recommends working collaboratively with state and Federal fisheries management agencies regarding all revenue exposure data, but this is especially important for data-limited species.

## **Recreational Fisheries**

Recreational fishing sectors in the northeast U.S. include NMFS/GARFO permitted charter and party vessels, highly migratory species (HMS) charter vessels, and private recreational angling. Of these three categories of recreational fishing, only the NMFS/GARFO permitted charter and party vessels are included in the socio-economic assessments developed by NMFS for each project area (See Table 1). Since there is no dealer sale for recreational fisheries, NMFS uses the results from industry surveys to assign a for-hire passenger fee per reported trip (<https://www.fisheries.noaa.gov/resource/data/socioeconomic-impacts-atlantic-offshore-wind-development>) to determine the revenue exposure for this sector. NMFS does not use the fishery footprint method for party/charter vessels. Party/charter data reflects only the point locations identified by the vessel operator and there is no independent data source to verify and model fishing location as available for commercial trips (i.e., there are no observers on party/charter trips).

For recreational fishing sectors other than NMFS/GARFO charter and party vessels, BOEM recommends conducting similar exposure estimates to Kirkpatrick et al.<sup>3</sup>) with the most recently available data and using at least 5 years of data. The exposure is calculated by using the average

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<sup>3</sup> <https://espis.boem.gov/final%20reports/5580.pdf>

annual percent of those trips from each state that occurred in federal waters. It should be noted that this method may also not be inclusive of all vessels as some (e.g., HMS) may be traveling further to fishing grounds than the suggested 30 miles used in Kirkpatrick et al. The recreational fishing industry should be consulted on these methods.

### **Shoreside Seafood Businesses**

As described in the National guidance, there may be impacts not only to harvesters, but also indirect costs to shoreside businesses. Shoreside businesses can generally be categorized as upstream (e.g., bait suppliers, ice suppliers, and other provisioning for harvest trips) and downstream (e.g., seafood dealers and processors). BOEM recommends using the Seafood Industry Impacts tool<sup>4</sup> (using state-specific economic impact tables based on the Fishery Economics of the United States report (2018)) and IMPLAN software model (2004). However, there are other sources and methods, including fishery-specific methods, that may be applicable and should be considered.<sup>5</sup> Each method has constraints and possible methodological biases. For instance, IMPLAN<sup>6</sup> / input-output type models may overestimate downstream revenue impacts given they do not allow input substitution (e.g., a processing company may substitute imports in instances of reduced landings, which would reduce the magnitude of downstream losses/revenue impacts). Previously approved COPs have used these tools to identify a multiplier (approximately 1-2%) to be used against the revenue exposure calculation for determining sufficient funds for claims of income loss. Lessees should discuss methods to calculate indirect revenue exposure with state and NMFS/GARFO staff.

### **Standards for Reporting and Forecasting Revenue Exposure**

When developing statistics on past fishery revenue exposure to forecast future revenue exposure and potential impacts from the proposed project, the lessee should consider information such as stock assessments, fisheries management actions, market conditions, and other factors that may influence revenue and landings over the period of the data analysis. For example, are fishery landings on an increasing or declining trend? What conditions are driving the trend? Are there old or new management measures that may result in a changed distribution of fishing effort? It is important to understand the data to accurately assess future revenue exposure and impacts.

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<sup>4</sup> <https://www.st.nmfs.noaa.gov/data-and-tools/FEUS/explore-the-data>

<sup>5</sup> King, et al., Economic Exposure of Rhode Island Commercial Fisheries to the Vineyard Wind Project, 2019; Rhode Island Department of Environmental Management, Rhode Island Fishing Value in the Vineyard Wind Construction and Operations Plan Area, 2019; Sproul letter, 31 May 2019 and King response, 14 November 2019, in Vineyard Wind's Construction and Operations Plan, volume 3, appendix 3. [https://www.boem.gov/sites/default/files/documents/renewable-energy/Vineyard-Wind-COP-Volume-III-Appendix-III-P\\_0.pdf](https://www.boem.gov/sites/default/files/documents/renewable-energy/Vineyard-Wind-COP-Volume-III-Appendix-III-P_0.pdf)

<sup>6</sup> <https://www.st.nmfs.noaa.gov/documents/Commercial%20Fishing%20IO%20Model.pdf>

Revenue exposure analyses included in plans should use the GDP Implicit Price Deflator for standardizing dollar amounts across years. The GDP Implicit Price Deflator is also the standard used by NMFS in fisheries management analyses.

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## Attachment 1: Data-Limited Species Snapshots<sup>7</sup>

### Whelk

**Commercial Fishery:** The whelk commercial fishery exists along the US Atlantic Coast and is mainly targeted by pots. Knobbed and channeled whelk are the primary species landed for most states, with lightning whelk also occurring in lesser amounts from Virginia to Georgia.

**Where:** US Atlantic Coast from Massachusetts to Georgia, with most of the commercial fishing occurring in the mid-Atlantic and New England regions.

**Management:** Whelk, sometimes called conch, is managed state by state, with minimum legal sizes (MLS) and reporting requirements varying by state. There is no FMP or federal permit required.

**Harvest and Data Reporting:** Harvest occurs in both state and federal waters, but no federal reporting requirements exist. VTRs are submitted only by vessels that carry federal permits for other species. Whelk is included in federal VTRs as bycatch when targeting other species, and federal VTR, dealer data, or fishing footprints should not be considered definitive sources of whelk catch and effort information.

All states have mandatory landings reports for whelk harvested in state waters. However, not all whelk landings are reported by species, dealer reporting is not mandatory among all states, gear type is not always reported, and not every state conducts biological sampling. The minimum landing size is not consistent among states, with some states lacking any kind of size regulation, which biases landings towards states with preferable regulations. Landings data are inconsistent among states (varies with type of gear used, average landings by pound, and recent landings trends).

**Value of Commercial Fishery:** Unspecified

**Data Snapshot:** Years of available data are unknown. A multi-state working group was established in 2021 to collect current information on the status of whelk along the coast, with the goal of producing a summary white paper in 2022.

**Summary:** Whelk data primarily reside within state-specific data programs and is unlikely to contain consistent location information. When the white paper is available in 2022, data summary should be reassessed.

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<sup>7</sup> This list is not comprehensive of all data-limited species with the potential for OSW interaction such as shrimp, smooth dogfish, spot, and others.



## **Jonah Crab** (*Cancer borealis*)

**Commercial Fishery:** Jonah crab were initially taken as bycatch in the lobster fishery along the Atlantic coast. Over the last two decades, landings have increased to a directed fishery in Southern New England, primarily using trap gear. In some areas, such as Maine, reports for Jonah crab may also include rock crab. The Jonah crab harvest in Maine is still a bycatch fishery. Note: The magnitude of the Jonah crab recreational fishery is unknown at this time but is believed to be quite small compared to the commercial fishery.

**Where:** Atlantic coast, with MA and RI the largest reported landings.

**Management:** Cooperatively managed by states and NOAA through the ASMFC. An FMP exists for Jonah crab, however, there are no stock assessments or established biological reference points for this stock. A stock assessment is planned for 2022.

**Harvest and Data Reporting:** At the federal level, Jonah crab landings are reported on VTRs only if a vessel has a federal permit for another species. There are no federal report requirements specific to Jonah crab. Based on a preliminary evaluation, Federal VTRs capture most of the total annual Jonah crab harvest from 2014-2019. Federal VTR coverage is higher offshore, and lower closer to shore, and most landings are from offshore areas.

States have a variety of reporting requirements. Most harvesters targeting Jonah crab that are not required to fill out federal VTRs, are required to file state harvester reports which include inshore State Statistical Reporting Area, or NMFS sub areas, NMFS Statistical Areas in federal waters, and/or LCMA. Like lobster (see Lobster section, below), this changed in 2021 to report by ten-minute squares. The state harvester reports from Maine have the same subsampled limitations as lobster.

**Value of Commercial Fishery:** In the early 2000's landings began to increase. In 2019, landings totaled approximately 16 million pounds of Jonah crab, representing \$13.1 million in ex-vessel value (<https://media.fisheries.noaa.gov/2021-05/FUS2019-FINAL-webready-2.3.pdf?null=>). Note that this is likely an underestimate of Jonah crab landings because of the species identification issues in Maine, but also that most landings are happening in southern New England. This could be underestimated as much as 1-2 million pounds in recent years, and as such would not be reflected by VTR's.

**Data Snapshot:** Data is available for  $\geq 10$  years, although data prior to 2008 may not be useful for assessing the current status. Federal VTRs likely capture most of the total Jonah crab harvest in recent years. NMFS statistical area data is consistently available across all states and federal reports, with some latitude/longitude information available through VTRs.

**Summary:** Federal VTR coverage is reasonably good for harvest information. State data can supplement if needed in areas of lower VTR coverage.

## **Atlantic Menhaden** (*Brevoortia tyranus*)

**Commercial Fishery:** Atlantic menhaden is the largest east coast fishery by volume and is executed primarily in both federal and state waters using purse seines. The fishery includes commercial bait and reduction harvest and operates from Maine through North Carolina, with state regulations varying down the coast. Note: Menhaden are also important bait in many recreational fisheries and are captured by cast nets or hook-and-line for recreational use.

**Where:** Commercial harvest occurs from Maine through North Carolina, with the highest commercial bait landings in NJ, ME, and MA. Reduction landings only occur in VA.

**Management:** ASMFC regulated the fishery and leads the stock assessments, but reduction harvest information is submitted to the NMFS Southeast Fishery Science Center (SFSC).

**Harvest and Data Reporting:** At the federal level, bait landings are reported on VTRs, and dealer reports only if a vessel has a federal permit for another species. There are currently no federal permits for the menhaden fishing. Atlantic menhaden catch is included in federal VTRs as bycatch when targeting other species and federal VTRs and dealer reports should not be considered the primary source of Atlantic menhaden catch and effort data.

States have a variety of reporting requirements. Approximately 50% of landings from 2018-2020 are captured on state-level VTRs, which include latitude/longitude fishing location information. The remaining bait harvest reported at the state level does not include fishing location information. Reduction landings, which only occur in VA, are reported through Captain's Daily Fishing Reports (CDFRs) that include detailed location and harvest information for each purse seine net set. CDFRs are submitted to the SFSC, but access to detailed information is limited due to data confidentiality. Most commercial menhaden landings in the Atlantic occur within 3 miles of shore (154,362 mt to 42,192 mt respectively).<sup>8</sup>

**Value of Commercial Fishery:** From 2011-2020, the total commercial landings average approximately 192,000 mt annually, of which about 142,300 mt are reduction and 49,600 mt are bait harvest. Monetary value of this fishery is unspecified. Note: Estimated recreational harvest in 2020 is approximately 1,157 mt, and monetary value is unspecified.

**Data Snapshot:** Data is available for  $\geq 10$  years. Federal VTRs capture about 7.5% of the total harvest. From 2018-2020, approximately 50% of bait landings are captured in state VTRs. The remaining bait landings are reported at the state level and are unlikely to include location information

**Summary:** State-specific harvest reports may be the best source for locationally linked data

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<sup>8</sup> <https://media.fisheries.noaa.gov/2021-05/FUS2019-FINAL-webready-2.3.pdf?null=> page 16

(depending on the state), but federal VTRs should also be integrated because they have location data for every trip. Some sort of correction or extrapolation may be needed to fill gaps.

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## **Atlantic Croaker** (*Micropogonias undulatus*)

**Commercial and Recreational Fisheries:** Atlantic croaker can be found from the Gulf of Maine to Argentina, but along the US Atlantic coast, they are most abundant from the Chesapeake Bay to northern Florida. Croaker is targeted by commercial and recreational fishers. The primary commercial gear in North Carolina and Virginia is gillnets, although trawls have been historically used. Atlantic coast commercial landings of Atlantic croaker exhibit a cyclical pattern, with low harvests in the 1960s/1970s and the 1980s/1990s, and high harvests in the mid-to-late 1970s, mid-1990s to early 2000s. Recreational fishing landings have also been variable over the last four decades.

**Where:** Atlantic coast, although Virginia harvests the majority of recreational croaker while North Carolina lands the majority of commercial croaker, followed closely by Virginia.

**Management:** Managed by ASMFC using a traffic light approach.

**Harvest and Data Reporting:** Spatial data is not consistently available through VTR reports as croaker is not a federally managed species. Federal VTR coverage is higher offshore, and lower closer to shore. North Carolina harvest is tracked through the state's trip ticket system which has spatial data categorized as either ocean waters 0-3 miles or greater than 3 miles and north or south of Cape Hatteras. Virginia Ocean spatial data can only be categorized between state waters and federal waters. Nearly all recreational harvest occurs within 3 miles of shore. Commercial harvest has more landings greater than 3 miles from shore than less than 3 miles from shore (<https://media.fisheries.noaa.gov/2021-05/FUS2019-FINAL-webready-2.3.pdf?null=>)

**Value of Commercial and Recreational Fisheries:** An estimated 5 million pounds of croaker were landed in 2020, with approximately 16% landed by the commercial sector and 84% harvested by recreational anglers. The monetary value of these fisheries is unspecified.

**Data Snapshot:** Data is available for  $\geq 10$  years. States have different levels of spatial categorization.

**Summary:** State harvest data may be the best source but is unlikely to contain latitude/longitude data.

## **Highly Migratory Species (HMS)- commercial and recreational fisheries**

**Fishery:** Highly migratory species, such as tunas, sharks, swordfish, and billfish, travel long distances and cross domestic and international boundaries. They are targeted commercially and recreationally, using a variety of gears (longlines, seines, gillnets, and hand gear). HMS commercial fisheries are mostly offshore, while recreational fisheries may tend to overlap potential wind energy call areas. Tournaments and for-hire fisheries occur for HMS in the Atlantic

**Where:** US Atlantic Coast and Gulf of Mexico

**Management:** Atlantic HMS are managed by NOAA and require different permits for different activities.

**Harvest and Data Reporting:** Commercial VTR data is limited for HMS in the northeast. Commercial reports for HMS are in logbooks, including location and landings, with fishing efforts generally offshore of wind call areas. Dealer reports may be able to be matched with logbooks but would require a deep dive.

Recreational fishing may occur more in areas that can be impacted by wind energy. In 2018, over 20,000 HMS permits were issued and there were more than 200 HMS tournaments. Some recreational catches are reported at the federal level, and some are reported at the state level (e.g., NC and MD).

**Value of Fishery:** Atlantic HMS recreational fishing is worth approximately \$510 million. Although not readily available at the regional level and aggregated for all HMS species, in 2019 landings of tuna species alone by U.S. fishermen at ports in the United States, American Samoa, other U.S. territories, and foreign ports were 526.1 million pounds valued at \$407 million. These tunas were also largely captured greater than 3 miles from shore.<sup>9</sup>

**Data Snapshot:** Years of available data are unknown.

**Summary:** Locational data may be difficult to determine from permits and reports. Landings and logbook data may contain some locational information, especially from commercial and tournament fishers. Pelagic survey and tagging could provide a proxy for species' distribution but aggregating that data to draw conclusions about impact may be difficult.

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<sup>9</sup> <https://media.fisheries.noaa.gov/2021-05/FUS2019-FINAL-webready-2.3.pdf?null=>

## **American Lobster** (*Homarus americanus*)

**Commercial Fishery:** The lobster commercial fishery is one of the most valuable fisheries along the US Atlantic Coast and is targeted primarily by pots. Historic stock numbers have fluctuated along the coast, but total commercial landings have steadily increased over the last three decades. Currently, Gulf of Maine/Georges Bank stock is at record high abundance, whereas Southern New England stock is depleted. Note: Lobster is harvested recreationally by pots and SCUBA, but overall recreational harvest is unknown and believed to be negligible compared to the commercial fishery.

**Where:** ME to NC, with most landings occurring in ME and northern New England.

**Management:** Cooperatively managed by the states and NOAA through the ASMFC. There are seven lobster conservation management areas (LMCA).

**Harvest and Data Reporting:** Federal VTR data varies by LCMA and NMFS Statistical Areas because VTRs were not historically required for vessels that did not hold other federal permits.

Since 2008, 100% dealer reporting at the trip level has been required in all states. State and federal dealer data includes statistics for value, landings, number of transactions, and port but generally cannot provide spatial data for where the lobsters were caught. For Maine, assumptions can be made for NMFS Statistical Area where lobsters were caught using dealer reported ports. Landings in other states cannot use the port as an approximation of area fished given the proximity of important ports to multiple areas, however, NMFS Statistical Areas, or smaller sub-areas, are reported in harvester reports to those states.

Since the early 2010s, 100% harvester logbook reporting has been required in all states except Maine. In most cases outside of Maine, this requirement to report to the state also applied to federal permit holders exempt from VTR reporting. In most states, these harvester logbooks can be used to characterize the spatial footprint of the fishery, including activity occurring in federal waters conducted by permit holders landing in that state, though it is generally limited to the large NMFS Statistical Area definitions. Spatial information was collected at the inshore State Statistical Reporting Area and/or NMFS Statistical Areas and LCMAs through 2020 and beginning in 2021, ten-minute square reporting, in addition to the traditional area reporting, became mandatory through ASMFC Addendum XXVI. This first year of higher resolution spatial data will become available for analysis later in 2022. For Maine, from 2008-2018, a randomly selected 10% of each zone and each license class were required to report via harvester logbooks. This changed to an optimized random selection in 2019. All states will require 100% harvester logbook reporting by 2023. A currently pending ASMFC Addendum XXIX may make vessel tracking mandatory for federal permits in the coming years.

For several states including Connecticut, Massachusetts, and New York, state harvester logbooks reported inshore State Statistical Reporting Areas, which in many cases are equivalent to NMFS

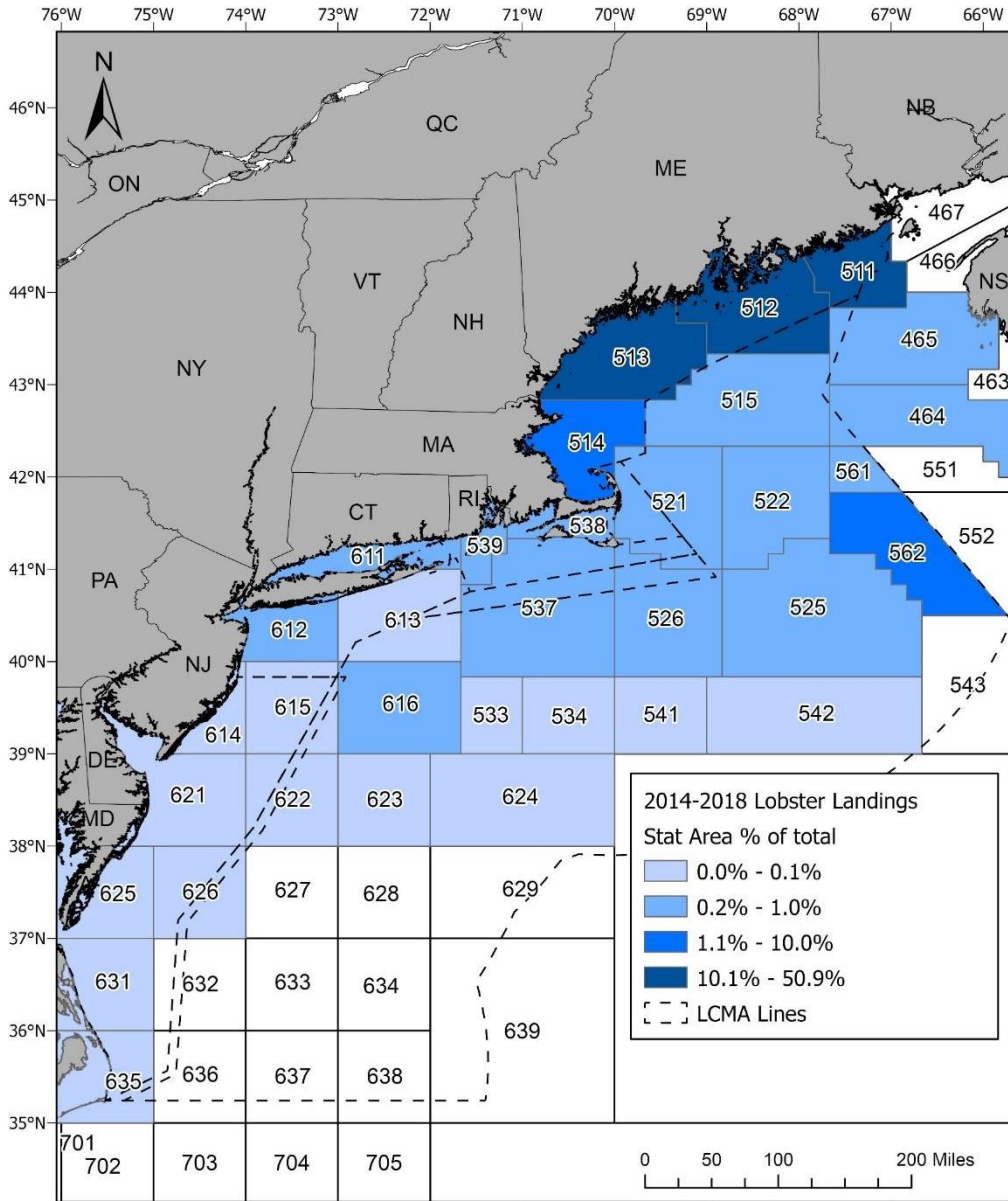
sub-areas, and/or NMFS Statistical Areas as spatial units prior to 2021. Others solely required NMFS Statistical Areas. In Maine, the available harvester logbooks provide a coarse resolution of reports by Maine Lobster Management Zone and distance from shore (0-3nm, 3-12nm, and 12nm+). To offer a gross characterization of the Maine lobster fishery, a spatial layer has been developed using a combination of the Maine dealer and harvester logbook data to extrapolate the landings, trips, and value by zone and distance from shore. As noted above, selection of the 10% sub-sample of the Maine fleet, prior to 2019, was not based on activity, so the number of licenses reported annually within each zone, especially outside of 12 nautical miles, varies from few to none so multiple years are necessary to estimate the offshore areas. This creates a patchwork of polygons that can characterize the intensity of annual landings, value, or trips per square mile, but is unable to describe the importance of some habitats over others. This assumption of equal distribution of the resource over large areas provides uncertainty around the extrapolation in Maine and nuanced or detailed spatial analyses beyond the NMFS Statistical Areas or sub-areas are not feasible in any region.

**Value of Commercial Fishery:** In 2021, the ex-vessel value for Maine alone was estimated to be \$725 million lbs. In 2019, approximately 126 million lbs. were landed coastwide, representing \$630 million in ex-vessel value. In 2016, landings peaked at 159 million pounds coastwide.

**Data Snapshot:** Data is available for  $\geq 10$  years. For most states (excluding Maine), 100% dealer and 100% logbook reporting have been required since 2010, but spatial information may be variable prior to 2021. For Maine, a spatial analysis tool using dealer and harvester logbooks can extrapolate some landing, value, and trips by zone and distance from shore, but has some uncertainty about habitat importance and equal distribution.

**Summary:** Federal VTR coverage is higher offshore, but lowest where the highest landings occur inshore (See figures A1 and A2 below). Dealer and harvest logbooks may provide some spatial coverage for most states. Maine's analysis tool can be useful but has some caveats.

**Figure A1. Percentage Combined 2014-2018 Lobster Landings by Statistical Area.** The landings by Statistical Area were estimated by states through the ASMFC Lobster Assessment process. The Lobster Conservation Management Area (LCMA) lines are included for reference.





**Figure A2. 2014-2018 combined VTR Landings/Total Landings by Statistical Area.** Some areas were grouped: 533/534/541/542 and 620's/630's. Areas in hatched blue have VTR landings that are greater than the assigned total landings for those statistical areas and should be used with caution. LCMA lines are overlaid for reference.

