

## **Information Needs to Assess Essential Fish Habitat Impacts from Offshore Wind Energy Projects Along the U.S. Atlantic**

### **Purpose and Overview**

This technical assistance document is designed to aid BOEM and lessees/project proponents in the development of the assessments of the effects of proposed offshore wind energy activities on Essential Fish Habitat (EFH) in NMFS' Greater Atlantic Region (GAR) (Maine - Virginia) and the Atlantic Coast portion of the Southeast Region (SER) (North Carolina to Florida)<sup>1</sup>.

This document provides an outline of the information and analysis needed to support a robust assessment of the potential effects of a proposed offshore wind energy development project on EFH in the GAR and Atlantic Coast portion of the SER. This information is necessary for BOEM to consult with NMFS on the potential project impacts to EFH, federally managed species, their prey, and other resources under NMFS' purview. This is not project specific and may not include all of the information needs for all projects. For each project, we expect that any description of baseline information or analysis of the potential effects of any action will be comprehensive and based on the best available scientific information.

### **Authority**

In the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Congress recognized that one of the greatest long-term threats to the viability of commercial and recreational fisheries is the continuing loss of marine, estuarine, and other aquatic habitats. Congress also determined that habitat considerations should receive increased attention for the conservation and management of fishery resources of the United States. As a result, one of the purposes of the MSA is to promote the protection of EFH in the review of projects conducted under federal permits, licenses, or other authorities that affect or have the potential to affect such habitat. The MSA requires federal agencies to consult with the Secretary of Commerce, through NMFS, with respect to "any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat identified under this Act," 16 U.S.C. § 1855(b)(2). The EFH provisions of the MSA can be found at: <https://www.govinfo.gov/content/pkg/FR-2002-01-17/pdf/02-885.pdf> (see pages 33-41).

In addition to the EFH provisions of the MSA, the Fish and Wildlife Coordination Act (FWCA), requires that all federal agencies consult with us (and any state counterpart) whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose by any federal agency. The FWCA also requires that those federal agencies consider the

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<sup>1</sup> Guidance for the Gulf of Mexico will be developed when needed and is expected to closely resemble this guidance document.

effects that these projects would have on fish and wildlife, prevent the loss of and damage to [fish and] wildlife resources, and provide for the development and improvement of those resources (16 U.S.C. 662(a)). The FWCA also established fish and wildlife conservation as a coequal purpose or objective of federally funded or permitted water resource development projects or proposals. Requirements of the FWCA are typically met through the assessment of impacts to all habitats and species (federally- and non-federally managed species) under our purview, in addition to the implementation of avoidance and minimization measures to prevent the loss of and damage to [fish and] wildlife resources, and mitigation measures to compensate for unavoidable impacts. In practice, and in consideration of the EFH consultation, the EFH assessment typically includes information relevant to, and required by, the FWCA, though this information can be contained in other documents.

### Contact Information

For information related to the EFH or FWCA consultations, contact:

#### **GAR**

- Karen Greene, Essential Fish Habitat Coordinator, Greater Atlantic Region
- Gabriella DiPreta, Greater Atlantic Regional Fisheries Office, Habitat and Ecosystem Services Division (New England): [gabriella.dipreta@noaa.gov](mailto:gabriella.dipreta@noaa.gov)
- Kira Dacanay, Greater Atlantic Regional Fisheries Office, Habitat and Ecosystem Services Division (Mid-Atlantic): [kira.dacanay@noaa.gov](mailto:kira.dacanay@noaa.gov)

#### **SER**

- Pace Wilber, Southeast Regional Office, Habitat Conservation Division (North Carolina South Carolina, Georgia, and the Atlantic coast of Florida): [pace.wilber@noaa.gov](mailto:pace.wilber@noaa.gov)

### EFH Assessments Information Needs

The following information should be addressed in the EFH assessment (excerpts from 50 CFR 600.920(e)). This includes both the mandatory contents and additional information to ensure a complete EFH assessment for offshore wind project consultations. NOAA Fisheries and BOEM have developed a template for EFH assessments that can be found on the [Technical Guidance for Offshore Wind Energy Projects in the Greater Atlantic Region](#) website.

#### **1. Preparation requirement**

For any federal action that may adversely affect EFH, Federal agencies must provide NMFS with a written assessment of the effects of that action on EFH. Adverse effect means any impact that reduces quality and/or quantity of EFH. Adverse effects 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 site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

## 2. Level of detail

The level of detail in an EFH assessment should be commensurate with the complexity and magnitude of the potential adverse effects of the action. For example, for relatively simple actions involving minor adverse effects on EFH, the assessment may be very brief. Actions that may pose a more serious threat to EFH warrant a correspondingly more detailed EFH assessment.

- a. *Please note: Offshore wind projects have the potential to result in substantial adverse effects to EFH and warrant a correspondingly more detailed EFH assessment. As a result, they will require an expanded consultation, please see CFR 600.920(i) on page 40 of the EFH Final Rule pdf (see link above) for the expanded consultation procedures. Offshore wind projects will also require all elements of both the “Mandatory contents” and “Additional information,” described in the EFH Final Rule and listed in items #3 and #4 below.*

## 3. Mandatory contents

This detailed description should include activity levels, frequency, duration, location, and intensity and should reflect the best available information on the activities and how the activities are likely to be carried out (see Appendix A for more detail).

The assessment must contain:

- a. A description of the action.
- b. An analysis of the potential adverse effects of the action on EFH and the managed species.
- c. The Federal agency’s conclusions regarding the effects of the action on EFH.
- d. Proposed mitigation, if applicable.

## 4. Additional information

If appropriate, the assessment should also include (see **Appendix A** for more detail):

- a. The results of an on-site inspection to evaluate the habitat and the site specific effects of the project.
- b. The views of recognized experts on the habitat or species that may be affected.
- c. A review of pertinent literature and related information.
- d. An analysis of alternatives to the action. Such analysis should include alternatives that could avoid or minimize adverse effects on EFH.
- e. Other relevant information.

## 5. Baseline habitat information

Detailed maps showing the extent and types of habitats within the project area (offshore lease area and onshore cable corridors) must be provided. We recommend that habitat within the project area be mapped consistent with the most-up-to-date version of our

“Recommendations for Mapping Fish Habitat<sup>2</sup>.” NMFS Habitat staff should be consulted prior to the planning and initiation of acoustic and benthic surveys to ensure appropriate mapping methods, data analysis procedures, and habitat classification methods are used to support the EFH consultation.

#### **6. Analysis of alternatives to the action**

Such analysis should include alternatives that could avoid or minimize adverse effects on EFH. This analysis should not be confused with a single maximum impact scenario analysis within an overall Project Design Envelope that is evaluated to fulfill NEPA project impact requirements. Instead, for EFH assessment purposes, it must assess the potential impacts of all possible project design parameters that may actually be selected (e.g., the effects of different turbine foundations or cable burying methods). This analysis should also consider alternate cable routes, turbine locations, landfall locations, and/or port facilities as appropriate.

#### **7. Assessment of impacts within the scope of the project area**

For the purposes of the EFH assessment, impact analyses should be limited to the area of direct and indirect impacts of each project component and/or activity and should be assessed by habitat type. For example, cable installation could result in direct impacts during cable burial activities and indirect impacts through sediment suspension and redeposition. The EFH assessment for cable installation should focus on the area, and habitats, that will be directly impacted through burial activities and the area, and habitats that will be indirectly impacted from sediment suspension and redeposition. The areas, and habitats, outside of the cable installation direct and indirect impact areas should not be considered in the evaluation and assessment of the effects of the impacts from cable installation on EFH. EFH impact analyses should be based upon the potential spatial extent of the effect of the project component or activity, and assessed, as appropriate, for each habitat type occurring within the identified impact area. While the NEPA impact analyses may focus on the effects of potential habitat impacts (e.g., negligible, minor, etc) in relation to the extent of available habitat outside the immediate project impact area, such an analysis is not consistent with the EFH regulations and is not appropriate for the EFH consultation.

#### **8. Assessment of impacts to benthic habitat types and their use by federally-managed species**

The impact assessment should focus on and evaluate how specific project activities could affect specific habitat types (e.g., depths and substrate types) designated as EFH for managed fish and invertebrate species within the project area and what measures are

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<sup>2</sup>[https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/60637e9b0c5a2e0455ab49d5/1617133212147/March292021\\_NMFS\\_Habitat\\_Mapping\\_Recommendations.pdf](https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/60637e9b0c5a2e0455ab49d5/1617133212147/March292021_NMFS_Habitat_Mapping_Recommendations.pdf)

being taken to avoid, minimize, or mitigate those impacts. The evaluation should consider the use of designated EFH by sensitive life history stages of managed fish and invertebrate species. Note: it is not necessary that this analysis be done for each individual species and life history stage, but instead for groups of species and/or life history stages that share the same habitat type; it should also include primary prey species consumed by managed fish and invertebrate species. An evaluation of the degree of habitat vulnerability to specific project activities should be included. Special attention should be paid to any activities that could affect any Habitat Areas of Particular Concern (HAPCs) designated within the project area as well as habitats and life stages that may be more vulnerable to impacts from the project.

The most-up-to-date EFH designations can be accessed using our EFH Mapper (<https://www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper>) and/or downloaded at: <https://www.habitat.noaa.gov/application/efhinventory/index.html>. The HAPC designations can be viewed, or linked to, within the EFH Mapper and shapefiles downloaded by selecting the “Habitat Areas of Particular Concern - (HAPC)” link at: <https://www.habitat.noaa.gov/application/efhinventory/index.html>.

#### **9. Assessment of pelagic habitat impacts**

The EFH assessment should include an evaluation of impacts to both benthic and pelagic habitats and the species that use them. An evaluation of pelagic habitat impacts should include an assessment of the project on the acoustic environment, existing hydrodynamics and primary productivity in the project area, and water quality, including any potential for disruption of contaminated material.

#### **10. Quality and sources of information**

Information sources used to support all analyses and conclusions should be cited with references to all scientific publications included in the bibliography. The EFH assessment should be based on the best available scientific information.

## Appendix A.

For all descriptions, include as much detail as possible including relevant mitigation, monitoring, and reporting requirements that are part of the proposed action. Each lettered item should be incorporated into the EFH Assessment (i.e. considered as a checklist of information to be included in the assessment).

### 1. EFH Baseline Information

- a. Detailed maps delineating habitat types within the project area (i.e. lease area and onshore cable corridor alternatives). The habitat maps should delineate soft sediment habitats, complex habitats, and benthic features, consistent with NMFS Recommendations for Mapping Fish Habitat. The delineations should be derived from acoustic survey and benthic sampling data as described in the fish habitat mapping recommendations. ([https://media.fisheries.noaa.gov/2021-03/March292021\\_NMFS\\_Habitat\\_Mapping\\_Recommendations.pdf?null](https://media.fisheries.noaa.gov/2021-03/March292021_NMFS_Habitat_Mapping_Recommendations.pdf?null)).
- b. Identify all HAPCs (e.g., summer flounder, inshore juvenile Atlantic cod, sandbar shark, etc.) in the project area and delineate areas consistent with the HAPC designations as appropriate.
- c. Identify and map areas of sensitive habitats and habitat features (e.g., rocky habitats, structure-forming taxa, submerged aquatic vegetation, shellfish beds, etc.).
- d. Provide a detailed description of habitat mapping methodology, including explanations of how survey data were collected and analyzed, and how maps were developed with reference to NMFS Recommendations for Mapping Fish Habitat.
- e. Include a list of all designated EFH in the project area by species and life history stages, with brief summaries of the habitat requirements, seasonal occurrence, prey species, spawning behavior, etc (see EFH text descriptions and other relevant information sources).

### 2. Project Information

Provide a detailed description of the proposed action, including a description of each project component and/or activity for all design parameters under consideration in the Project Design Envelope.

- a. All potential wind turbine generators (WTG) foundation types and sizes considered under the design envelope.
- b. The proposed number and layout of WTGs: if there is a range in the number of potential WTGs all potential layouts should be considered and presented.
- c. All potential scour protection measures, materials, and their spatial extent.
- d. Anticipated locations and extent of anchoring, including how vessels will be secured to the substrate

- e. Detailed pile driving methodology, including the time of year and duration of installation
  - f. Detailed information on all potential cable installation methods and construction schedules, including any site preparation (e.g. boulder relocation, corridor clearing/sweeping, dredging, etc).
  - g. Onshore cable connection location(s) and installation methodology.
  - h. Port facilities, including new and/or expansions or modifications of existing facilities. This should include facilities necessary for the construction and operations and maintenance of the project, as appropriate.
  - i. Any potential dredge spoil removal and disposal method(s) and location(s).
  - j. All relevant operational, maintenance, and decommissioning activities, including cable repair and maintenance methodology.
  - k. Other
- 3. EFH Impact Assessment** When analyzing the potential impacts to EFH for each of the relevant project activities listed above, the following items should be considered for both the offshore and nearshore project components and activities. These items should consider all federally managed species and life stages with EFH designated in the project area. Other content should be added as appropriate.
- a. Identify and analyze potential effects of each project component and activity on specific habitat types/species groups within project impact areas. This should include an evaluation of all potential effects of a project component or activity on designated EFH, inclusive of direct (e.g. pile driving) and indirect (e.g. underwater noise) effects.
  - b. Evaluate and assess potential impacts to designated EFH habitat types and/or features most vulnerable from each project component and activity. This evaluation should consider the proximity of each project component and activity to vulnerable habitats and features (e.g., rocky habitats, structure-forming taxa, submerged aquatic vegetation, shellfish beds, etc.) identified in the project area.
  - c. Evaluate and assess potential impacts to all identified HAPCs (e.g., inshore juvenile Atlantic cod, sand tiger shark, summer flounder) in the project area and all measures proposed to avoid, minimize and mitigate such impacts.
  - d. Identify the expected duration and spatial extent of suspended sediments and sediment deposition, and the expected impacts to pelagic and benthic resources and habitats within and adjacent to proposed turbine locations and cable corridors. This analysis should be completed for each potential installation method that may be used.
  - e. Evaluate potential habitat impact from electro-magnetic fields (EMF), including effects on movements and migrations of managed fish and invertebrate species, and their prey.

- f. Evaluate impacts to managed fish and invertebrate species and prey resulting from habitat loss and conversion (e.g., potential “reef effect”; converting natural seafloor substrates to turbines, cables, and scour protection).
- g. Evaluate the potential impacts to existing substrates and habitats (e.g., benthic community disturbances and losses as a result of trenching, boulder relocation, etc) and potential for expansion and/or introduction of invasive species as a result of the installation of novel substrates and materials (e.g., cable protection, turbines, etc).
- h. Evaluation of acoustic effects, including an assessment of the spatial extent of sound pressure and particle motion and the impacts that may occur to managed fish and invertebrate species during both construction and operations of the project. This assessment should include an evaluation of potential impacts to spawning behavior and settlement with consideration of the proposed time of year schedule to relevant life history stages of managed fish and invertebrate species and their prey. The assessment should provide a general analysis of potential impacts to EFH from particle motion based on the best available science (understanding standard thresholds have not yet been established). The assessment of effects from sound pressure should be based upon the best available science to determine the appropriate thresholds to incorporate into the evaluation. Currently, NOAA Fisheries considers the potential for behavioral disturbance with exposure to noise greater than 150 dB re 1 uPa rms and utilizes the FHWG (2008)<sup>3</sup> interim criteria for injury associated with impact pile driving. However, Popper et al. 2014<sup>4</sup> ANSI guidelines are widely used and recognized as the best available science and we recommend including both sets of criteria for acoustic modeling. Further, species-specific information based upon the best available science should be included when available. Species-specific impact evaluations should be provided for species that may be more sensitive to acoustic impacts (e.g. Atlantic cod), as well as invertebrate species that are not addressed in either FHWG (2008) or Popper et al. (2014).
- i. An evaluation of potential hydrodynamic impacts from the presence of WTGs, as well as cable and scour protection measures should be provided. The assessment should focus on potential effects to thermal regimes, larval distribution patterns, primary production, and prey distribution. Direct and indirect impacts of hydrodynamic changes on water temperatures and sediments (e.g. sediment

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<sup>3</sup>FHWG 2008,

<https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/ser/bio-fhwg-criteria-agree-all.pdf>

<sup>4</sup> Popper, A. N., Hawkins, A. D., Fay, R. R., Mann, D. A., Bartol, S., Carlson, T. J., ... & Løkkeborg, S. (2014). Sound exposure guidelines. In ASA S3/SC1. 4 TR-2014 Sound Exposure Guidelines for Fishes and Sea Turtles: A Technical Report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI (pp. 33-51). Springer, Cham.



suspension) should be evaluated for both pelagic impacts (e.g. turbidity) as well as benthic impacts (e.g. scouring, sediment redeposition).

- j. Potential impacts to water quality should also be evaluated for impacts to EFH, including potential resuspension of contaminated material from seafloor disturbance. Impacts to benthic EFH from redeposition of contaminants into adjacent areas should also be evaluated.

#### **4. Avoidance and Minimization Measures**

- a. For all identified adverse impacts to managed fish and invertebrate species EFH and their prey, detailed information on avoidance and minimization measures that will be employed should be provided.
- b. The effectiveness of all proposed measures that will be included to avoid and minimize adverse impacts to specific habitat types, species or species groups, and prey species should be evaluated and assessed.
- c. Relevant monitoring plans should be provided with the EFH assessment. Any acoustic impact monitoring plan should include measures to ensure target attenuation levels are maintained during construction. A benthic monitoring plan should clearly demonstrate that scientifically robust data, capable of detecting changes in the community structure of benthic fauna and juvenile fish species, will be collected and evaluated. If other project specific monitoring (e.g. turbidity) is necessary, the applicable monitoring plan should be provided. Any additional proposed fisheries or environmental monitoring plans should be provided.

#### **5. Mitigation**

- a. In cases where a particular project component or activity is expected to have more than a minimal impact to a given habitat type, any proposed mitigation to offset such impacts should be fully described and presented.
- b. Explain how the proposed mitigation is expected to compensate for impacts to managed fish and invertebrate species EFH.
- c. Justify conclusions using the best available scientific information.

#### **6. Conclusions**

- a. Identify project activities that are expected to have negligible, minimal, or more than minimal adverse impacts to specific habitat types, as short-term (< 2 years), long-term (2 years to < life of the project), or permanent effects (life of the project) (i.e., include a table linking individual project activities to specific EFH habitat types and species groups, with relevant discussion and analysis). As described above, this evaluation and determination must be based upon the area of project impact (i.e. the habitat within the area affected by a specific project

component and/or activity) and should not consider the extent of similar habitat adjacent to or outside the area of impact.

- b. Justify conclusions using the best available scientific information.