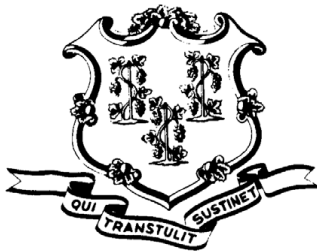


State of Connecticut



Report and Recommendations of the
Commission on Environmental Standards
for Minimizing and Mitigating Environmental and Commercial Impacts
of the Construction and Operation of Offshore Wind Facilities

July 18, 2019

DRAFT

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INTRODUCTION

Pursuant to Section 1 of Public Act 19-71 (the Act),¹ Connecticut Department of Energy and Environmental Protection (DEEP) Commissioner Katie Dykes established a Commission on Environmental Standards (the Commission) to provide input on best practices for avoiding, minimizing and mitigating any impacts to wildlife, natural resources, ecosystems and traditional or existing water-dependent uses, including, but not limited to, commercial fishing, during the construction and operation of offshore wind facilities eligible pursuant to the Act.

The Commission adhered to the following schedule:

June 14, 2019	Public organizational meeting, convened by Commissioner Dykes. The Commission split into two subcommittees: one to investigate issues related to wildlife/natural resources, and one regarding commercial fisheries.
June 14-21, 2019	Public opportunity to submit information and documentation for consideration by the Commission.
June 21 - July 10, 2019	Commission subcommittees deliberated on the information and documentation provided and developed draft recommendations.
July 10, 2019	Public meeting for discussion on subcommittee recommendations.
July 15, 2019	Commission submitted comments to the draft Request for Proposals for offshore wind resources. ²
July 18, 2019	Commission released draft report.
July 18-25, 2019	Opportunity for public comment on the Commission's draft report.
July 31, 2019	Commission released final report.

The Commission's deliberations led to recommendations on the following topics:

1. Adaptive Operational Plan
2. Mitigation Fund
3. Decommissioning Plan and Funding
4. Wildlife Risks
5. Hazards to Navigation, Safety at Sea, and Interference with Fishing Operations
6. Impacts to Federal Fisheries Assessment Surveys

The report is organized by these topics, and threshold and qualitative recommendations are presented for each topic. Threshold items are items that the Commission recommends as requirements for each bidder to meet in order to be eligible for the offshore wind resources Request

¹ <https://www.cga.ct.gov/2019/ACT/pa/pdf/2019PA-00071-R00HB-07156-PA.pdf>

² [http://www.dpuc.state.ct.us/DEEP/energy.nsf/c6c6d525f7cdd1168525797d0047c5bf/4065218fbd53d5658525842a00705f7a/\\$FILE/2019.07.01_OSW%20RFP%20\(Draft\).pdf](http://www.dpuc.state.ct.us/DEEP/energy.nsf/c6c6d525f7cdd1168525797d0047c5bf/4065218fbd53d5658525842a00705f7a/$FILE/2019.07.01_OSW%20RFP%20(Draft).pdf)

for Proposals (the RFP), and qualitative items are those that the Commission recommends be used in evaluating the strength of the bidder's proposals.

While there was a significant amount of information presented to the Commission during this process, it is acknowledged that the environmental impacts of offshore wind development is an evolving field and best practices have not been clearly identified for all topic areas.

DEEP's Role

The recommendations made in this report are those of the members of the Commission. This report does not necessarily comprise the views and opinions of DEEP and should not be construed as such. DEEP will consider the final recommendations of the Commission in finalizing the first RFP solicitation called for by Public Act 19-71.³

³ Ibid.

1. ADAPTIVE OPERATIONAL PLAN

It is not possible to anticipate all potential impacts to the environment and commercial fishing operations that might arise from offshore wind development along the northeast Atlantic shelf. Some impacts may be immediate and easily observed, while others may be more subtle and take years to manifest. A sustained monitoring and research effort will be necessary to fully understand the impacts of development.

The Commission recommends that the information obtained from these ongoing studies serve as the basis for an adaptive mitigation plan, in which the developer, DEEP, and other stakeholders periodically assess information gathered and make “course corrections” to mitigation efforts.⁴

The Commission suggests the study efforts that serve as the basis for the adaptive mitigation plan be “industry-funded research”; they should be funded by the developer from funding sources separate from any “mitigation funds” that are set up strictly to offset economic losses to the commercial fishing industry.

The information obtained from these research efforts will inform mitigation planning for future offshore wind development, and can therefore be viewed as an investment. The Environmental and Fisheries Mitigation Plan is just the starting point for the project, the following adaptive mitigation process should be cooperative, transparent, and subject to independent review (See Appendix A at the end of this document for more information on adaptive management).

The duration, scope, and objectives of research and monitoring efforts should be determined by a committee composed of representatives of the selected developer, DEEP, the commercial fishing industry, environmental experts, and other stakeholders as deemed appropriate.

Threshold or Qualitative?	Document/Detail
T	Adaptive operational plan presented
T	Plan to coordinate and have ongoing consultation with Connecticut DEEP and Stakeholders as design and operation decisions are worked out with BOEM
Q	Clear identification of stakeholders including all entities concerned about the impacts to the environment or fisheries resulting from all phases and locations of the project

2. MITIGATION FUND

The Commission advises that the developer commit some amount of money “up front” to a mitigation fund. This fund should be separate to the funding source used to support activities pursuant to the Adaptive Operational Plan (see above).

⁴ For more information on adaptive management, see the report Adaptive Management: The U.S. Department of the Interior Applications Guide (p. 12) at the following link: <https://www.doi.gov/sites/doi.gov/files/migrated/ppa/upload/DOI-Adaptive-Management-Applications-Guide.pdf>.

The mitigation fund should be used to offset economic losses or burdens to the commercial fishing industry, elements of the environment, and other stakeholders that arise from unavoidable impacts of offshore development. This fund should not be used in place of avoiding and minimizing impacts.

The Commission recommends that the assessment of impacts to commercial fishing businesses should include not only the direct economic losses resulting from loss of access to fishing grounds, but also socio-economic considerations such as the impacts to related businesses within coastal communities, and any loss of qualified workforce hired away to jobs in the offshore development industry.

The mitigation fund should be administered by an independent third party (not the State of Connecticut or the developer); both the Commission on Environmental Standards and the developer should maintain an advisory role in the administration of the fund.

Threshold or Qualitative?	Document/Detail
T	Identification of source of money for upfront mitigation costs
T	Identification of steward of fund
T	Identification of decision-making process for fund administration

2.1 Ongoing Funding of the Mitigation Fund

The Commission recommends that the developer detail their intent to provide an ongoing, reliable source of funding to the Mitigation Fund (see above), with preference given to proposals that tie ongoing funding to generation – i.e. a specified set-aside to the fund per kW generated.

Threshold or Qualitative?	Document/Detail
T	Plan to provide ongoing funding of the mitigation fund
T	Plan to fund based on kW generated

3. DECOMMISSIONING PLAN AND FUNDING

The Commission recommends that the developer provide plans for decommissioning installations at the end of their service life. The Commission suggests that this plan include information on procedure for decommissioning and intended state of the installation site after decommissioning is complete. Developers should also identify the source of funding for decommissioning and provide assurances as possible that this funding will be available at the time of decommissioning.

Threshold or Qualitative?	Document/Detail
T	Description of plans to decommission installations

T	Identification and assurance of source of funding for decommissioning sufficient to return to pre-existing conditions
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4. WILDLIFE RISKS

The Commission recognizes that proposals will be in various stages of completion. It is therefore important that the application contain three main components. These components are an *Assessment and Monitoring Plan*, a *Mitigation Plan*, and a *Data Reference and Sharing Plan*.

4.1 Assessment and Monitoring Plan

The Commission recommends that developers provide a site-specific inventory including all species that could reasonably be expected to be present at the development site. The developer should also plan for inventory and monitoring where it doesn't currently exist for these species.

The Commission advises that this inventory and monitoring plan addresses all project phases: pre-construction, construction, operation, transition, and decommissioning. Transition includes periods during which existing turbine installations are being retrofitted. Such periods could occur as needed during any point of an installations service life, for purposes of repair, incorporation of new technologies, or removal of components that have reached the end of their service life.

Inventory and monitoring locations need to address all areas manipulated by the project including interconnection points as well as the project site.

The Commission recommends the status of each species (Federally and/or State Threatened, Endangered, Low Conservation Concern, etc.) be included in the inventory. Developers should coordinate with agencies and institutions about methods that are consistent with existing datasets and are specific to the local environment.

These inventory and monitoring reports and plans should include detail and documentation required by the Environmental Impact Statement (EIS) submitted to the Federal Agencies. Additionally, the Commission recommends specific attention to the following inventory and monitoring details that may or may not be required by the federal EIS.

Wildlife	Inventory T or Q	Threshold Detail/Documentation
All	T	Provide Inventory and Monitoring plan as required by the EIS federal report
All	T	Inventory and monitoring plan must address any federally or state endangered, threatened or species of special concern, Candidate species for listing, and species listed as Near Threatened or of higher risk on the IUCN Red List.
All	T	For Endangered Species: Include the statistical power of the survey and monitoring technique to detect and quantify abundance, frequency of site use, Time of year use
All	T	For all species that will be disproportionately affected by the project: Include the statistical

		power of the survey and monitoring technique to detect and quantify abundance, frequency of site use
All	Q	Prioritization Scheme for decisions between conflicting mitigation recommendations for species, including but not limited to how developer would weigh particular species that would be disproportionately impacted
All	Q	Reference standardized protocols
All	T	Reference regional cooperation
All	Q	Aggregate data sources, and results of new data
All	Q	Specify survey technique/technology for other species
All	T	Monitoring plan or plan to create one that details reference information, known important variables to monitor, standardized monitoring and data for comparison
Inventory and Monitoring Specific to Certain Groups		
Marine mammals and Sea Turtles	T	Any survey technique at night should ensure visibility of NARW at 500m and 180degrees
Marine mammals and Sea Turtles	Q	Plan to develop new technology to provide real-time reporting of animal location to mariners/stakeholders
Birds and Bats	T	Make use of available technology including but not limited to radar and nanotags
Birds and Bats	T	Assess nocturnally migrating birds
Birds and Bats	T	Assess height of migration
Fish	T	NMFS trawl surveys (see more detail in Impacts to Federal Fisheries below)
Invertebrates	T	Specifically address squid and scallops
Benthic Habitats	T	Specifically address hard bottoms
Coastal Habitats	T	Specifically address hard bottoms
Water Quality		

4.2 Mitigation Plan

The Commission recommends, for each species grouping, that the developer provide information on a plan to anticipate and avoid risks to species arising from each stage of offshore development (pre-construction, construction, operational, transitional, and decommissioning), and all locations where project activities will occur including, but not limited to, interconnection, transmission, and turbine locations.

Assessment of risk by potential stressors should include all elements required in the Environmental Impact Statement (EIS) presented to Federal Agencies. The Commission also encourages developers to conduct additional research to expand knowledge and best management practice guidance for wind development. The Federal EIS are very comprehensive and the Commission has highlighted

details of stressors that should be included but may or may not have been required by the EIS to Federal Agencies.

1) Underwater sound (EIS): Sounds resulting from bottom surveys, ships, and construction may risk introducing possible changes in mammal behavior, including effective habitat reduction because of sound avoidance, interruption of life-cycle activities, and injury to hearing. For some marine mammals, low-frequency sounds produced by pile driving, if performed in close proximity to an animal, can potentially cause permanent damage to hearing or temporarily make it difficult for the animal to hear predators, prey, and each other (NYSERDA Appendix E⁵). The bidder should provide a description of how it will avoid, minimize, and mitigate the projects risk to marine mammals and sea turtles. Specifically, the Commission recommends:

a) Threshold components:

i) Developer should have a plan to eliminate risk of exposing North Atlantic Right Whale to underwater sound at a decibel level that does not exceed 160 dB re 1 μ Pa²-s at 1/2 mile distance from the noise source

b) Quantitative components:

i) Developer commits to not producing underwater sound at above decibel level

ii) Developer considers sound at other levels that may affect behavior, reproduction, cumulative, and physiological impacts on wildlife such as monitoring for stress hormones, secondary effects (e.g. increased ship strikes)

iii) Developer includes plans to research thresholds for sound guidance including:

iv) Risk of exposure duration

v) How sound exposure translates to specific wildlife

vi) Developer specifically addresses research to better understand effects of pile driving on auditory abilities and behavior of sea turtles

2) Collision with animals and commercial fisheries from structures and vessels traveling to/from project area. The Commission suggests that the application include a description of how the Proposer will seek to minimize the risk of ship strikes through timing, speed restrictions, use of shipping lanes, and other mitigation measures. The application also should address risk of direct mortality to birds and bats from collisions with wind turbines and other structures.

c) Threshold components:

i) Plan for adaptation of turbine placement based on initial assessment

⁵ NYSERDA Appendix E – Elements of the Environmental Mitigation Plan (2018). Retrieved July 18, 2019 from <https://www.nyserda.ny.gov/All%20Programs/Programs/Offshore%20Wind/Offshore%20Wind%20Solicitations/Generators%20and%20Developers/2018%20Solicitation>.

- ii) Consider pros-cons to 2 nautical mile spacing to wildlife and fisheries
 - iii) Consider pros-cons to East-West orientation to wildlife and fisheries
 - iv) Plan for altering turbine operation and lighting based on initial assessment
- d) Quantitative points for considering specific mitigation measures demonstrated to avoid collision, e.g. “aircraft controlled lighting”
- i) Plan to use and enforce vessel speeds using the “10 knot rule,” where all vessels 65ft or longer must travel at 10 knots or less in certain locations (Seasonal Management Areas) along the US east coast at certain times of the year to reduce the threat of ship collisions with endangered North Atlantic Right Whales.
 - ii) Quantitative: plan to expand rule for vessels smaller than 65ft
 - iii) Altered animal movements: Offshore wind is a new industry in the Atlantic and all potential impacts are not known, it is critical that current use by wildlife is well understood before construction and changes to use by wildlife continue to be monitored during and post-construction to that unexpected impacts can be avoided, minimized, and mitigated.
 - iv) Plan for flexible turbine placement that avoids altered animal movement based on initial assessment
- 3) Risk to Fish, Invertebrates and their Habitats: The principal potential risks of offshore wind energy development to fish, invertebrates and their habitats include possible changes to the seafloor physical structure and other habitats, increased sediment levels in the water column, salinity, temperature pH, flow, noise and sensory disturbances, and direct harm to fish and invertebrate species from construction equipment. These changes could result in changes in predator/prey relationships, competition between species and changes to fish and invertebrate populations in and around the Project site. The developer should provide a description of how it will work to avoid, minimize, and mitigate the projects risk to this group. The Commission specifically advises addressing:
- e) Specific techniques that will be used to minimize effects of electromagnetic fields such as cable shielding, cable placement and depth, and buffer zones from sensitive areas.
 - f) Specific plan to avoid, minimize, and mitigate invasive species establishment from construction as well as long term presence of wind farm structures and operation
 - g) Cumulative impacts and secondary effects
 - h) Threshold: The areas included in the other lease sales should be considered in the cumulative impact analysis, even if the project specific parameters are not fully understood. The companies that have secured leases to these offshore wind development sites have made a

substantial investment, and it is reasonably foreseeable to anticipate this investment will lead to offshore wind development. The Commission considers these to be “reasonably foreseeable” projects, and including them in the cumulative assessment is essential for a meaningful understanding of the impact of wind energy on our trust resources and fishing communities.

i) Quantitative: Designate no build zones to protect wildlife

j) Quantitative: Effects of wind energy removal on ecosystem

In addition to mixing effects anticipated with the installation of massive fixed structures, other impacts may result from atmospheric changes associated with large-scale offshore wind energy development. Wind energy facilities are designed to efficiently remove or harvest wind energy from the ecosystem, which may change underwater conditions based on reduced shear effect at the surface of the ocean. The Commission recommends the RFP address any potential environmental impact of removing energy from this atmospheric boundary layer and the overall ecosystem shifts that may result from the combination of atmospheric and hydrographic changes.

Risk/Stressor	Quantitative or Threshold	Detail/Documentation
Sound	T	Developer should have a plan to eliminate risk of exposing North Atlantic Right Whale to underwater sound at a decibel level that does not exceed 160 dB re 1 μPa^2 -s at 1/2 mile distance from the noise source.
Sound	Q	Developer <i>commits</i> to not producing underwater sound at above decibel level
Sound	T	Minimum size of exclusion zone intended to be monitored during geophysical surveys and construction
Sound	T	Developer commits to seasonal restrictions on activities to avoid risk of sound especially to NARW
Sound	Q	Developer considers sound at other levels that may affect behavior, reproduction, cumulative, and physiological impacts on wildlife such as monitoring for stress hormones, secondary effects (e.g. increased ship strikes)
Sound	Q	Developer includes plans to research thresholds for sound guidance including: Risk of exposure duration How sound exposure translates to specific wildlife
Sound	Q	Developer specifically addresses research to better understand effects of pile driving on auditory abilities and behavior of sea turtles

Collision	T	Plan for adaptation of turbine <i>placement</i> based on initial assessment <ul style="list-style-type: none"> • Consider pros-cons 2 nautical mile spacing to wildlife and fisheries • Consider pros-cons East West orientation to wildlife and fisheries (see also detail about perimeter and turbine array in Hazards to Navigation below)
Collision	T	Plan for altering turbine <i>operation</i> and lighting based on initial assessment
Collision	Q	Points for considering specific avoidance techniques e.g. “aircraft controlled lighting”
Collision	T	Plan to use and enforce vessel speeds using the “10 knot rule”
Collision	Q	Plan to expand 10 knot rule for vessels smaller than 65ft, or plan to include PSO for all vessels
Altered Animal movements	T	Plan for flexible turbine placement (pre-construction) or turbine operation and lighting that avoids altered animal movement based on initial assessment and continued monitoring.
Habitat Changes	Q	Specify techniques to avoid and minimize impacts from EMF
Habitat Changes	Q	Specify plan to avoid, minimize, and mitigate invasive species establishment from construction as well as long term presence of wind farm structures and operation
Cumulative	T	Plan to assess risks to the Environment from the addition of this project to those that have been leased
Cumulative	Q	Designated No Build Zones
Cumulative	Q	Effects of wind energy removal on ecosystem

4.3 Data Reference and Sharing Plan

Offshore wind in the Atlantic is a developing industry and there is great benefit from referencing existing data sources and plans as well as making new inventory, monitoring, and research results available for benefit of environmental protection. The Commission advises that the developers reference existing data sources and coordinate regionally including the following recommended details:

Quantitative or Threshold	Detail/Documentation
T	Reference these existing Management plans and associated Data portals: <ul style="list-style-type: none"> • Long Island Sound Blue Plan

	<ul style="list-style-type: none"> • Northeast Ocean Plan • Other Relevant State Ocean Plans
Q	Other portals and data plans referenced
T	Bidders shall have a Data Sharing and Transparency plan to store and share inventory and monitoring data
T	Bidders shall plan to coordinate with existing Regional Science Organizations
T	Specific reference to ROSA
Q	Specific reference to other Regional Science Entities
Q	Plan to create or fund educational or training products to prevent ship strikes between mariners and aquatic wildlife

5. HAZARDS TO NAVIGATION, SAFETY AT SEA, AND INTERFERENCE WITH FISHING OPERATIONS

Installation of wind turbines in offshore areas transited by commercial fishermen has the potential to pose serious hazards to navigation and safety, and may also interfere with deployment of certain fishing gears. The Commission encourages the bidder to present an assessment of potential hazards and measures that will be taken to minimize those hazards. In accordance with the Commission’s recommendations, the topics addressed should include but not be limited to:

- 1) Turbine orientation and configuration
 - a) Preference should be given to proposals that commit to an east-west orientation to turbine arrays
- 2) Turbine spacing
 - a) Preference should be given to proposals that commit to a minimum of 2 nautical mile spacing between turbines
- 3) Cable burial
 - a) Developer should provide details on proposed transmission cable route, burial depth, and plans to cover cables in areas where proposed burial depth is not achievable.
 - b) Preference should be given to proposals that commit to using established burial best management practices such as the Cable Burial Risk Assessment (CBRA) that has been used in Europe
- 4) Minimizing risk of collision

- a) Developer should provide details on lighting, radar beacons, AIS beacons, and other devices/technologies that will be used to minimize risk of collision
- b) Developer should provide details on plans to retrofit commercial fishing vessels operating in the development area with technologies that will minimize risk of harmful collision (e.g. anchor winches, updated radar technology)

5) Indemnification

- a) Developer should make commitments to holding commercial fishermen and other mariners harmless for damage to turbines or associated structures arising from unavoidable collisions

6) Transit lanes⁶

- a) Developer should describe the collaborative process they will undertake with commercial fishermen and other mariners to determine transit lanes through the turbine array that will minimize disruptions to standard transit pathways through the development area and risks of collision
- b) Preference should be given to proposals that commit to transit lanes with a minimum width of 4 nautical miles

7) Potential interference with search and rescue operations

8) Potential interference with mobile and fixed fishing gears typically used in the development area

- a) Preference should be given to proposals that demonstrate intent to work collaboratively with the commercial fishing industry to understand potential gear conflicts, and possibly retrofit commercial fishing vessels with gears or technologies that will minimize those conflicts

Threshold or Qualitative?	Document/Detail
T	Details on proposed perimeter and orientation of turbine array, locations of and spacing between individual turbines. Assessment of pros/cons of proposed turbine array configuration. (see also Wildlife Assessment above)
T	Plans to collaborate with commercial fishermen, other mariners, USCG, and other appropriate stakeholders to determine transit lane locations and width
T	Proposed location and burial depth of transmission cables, description of process used to assess risks posed by transmission cable route and burial depth, plans to monitor and re-bury cables when necessary
T	Technologies that will be employed to minimize risk of collision
Q	Commitments to hold mariners harmless for no-fault collisions

⁶ http://www.nyfisheriestwg.ene.com/Content/files/NY%20Bight%20Transit%20Lanes%20Workshop%20Summary_3.27.19.pdf

T	Potential risk of interference with search and rescue operations
T	Inventory of commercial fisheries that occur in the development area, gears that are used to prosecute those fisheries, and potential conflicts of those gears with turbine array

6. IMPACTS TO FEDERAL FISHERIES ASSESSMENT SURVEYS

NOAA National Marine Fisheries Service (NMFS) conducts trawl surveys in federal waters to assess the status of a multitude of economically and ecologically important fish and invertebrate species. These surveys play a major role in the inter-state fisheries management process conducted by the Atlantic States Marine Fisheries Commission and Federal Fisheries Management Councils. Offshore wind development in some areas may exclude NMFS trawl vessels from long-term sampling sites, thus impacting the scientific foundation of the fisheries management process. The bidder should provide an inventory of any scientific surveys which will be impacted by development, and their plans to collaborate with the entities conducting those surveys to mitigate impacts, as advised by the Commission.

Threshold or Qualitative?	Document/Detail
T	Inventory of scientific surveys operating in the development area and any sampling sites that will no longer be accessible by those surveys following development
Q	Plans to collaborate with NOAA NMFS and other scientific stakeholders to develop strategies to offset impacts to scientific surveys: e.g. identification of alternative sampling sites or gears, funding of studies to determine comparability of data gathered by alternative gears