

Vessel Strike Avoidance Plan

Submitted To:

**National Marine Fisheries Service
Office of Protected Resources
Silver Spring, MD;
Bureau of Ocean and Energy Management
Washington D.C.; and,
Bureau of Safety and Environmental Enforcement
Washington D.C.**

Submitted By:

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February 2024

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Introduction

Vessel strikes are a well-documented threat to marine mammals with the likelihood and severity of impact highly variable among species. Studies suggest that vessel strikes pose a greater risk to baleen whales than other marine species due to their large size, slower maneuverability, and larger proportion of time spent at the surface (Nowacek et al. 2001; Parks et al. 2012; Cusano et al. 2018; NOAA Fisheries 2020). As a result, vessel strike is among the leading sources of known human-caused mortalities for large whales. Vessel strike has also been identified as a potential source of mortality to sea turtles and sturgeon in this region. In the case of sturgeon, vessel strikes have primarily been documented within river systems and estuaries. Evidence from stranded sea turtles indicates that 15% to over 50% of mortalities may result from vessel strikes, depending on the species and region (NMFS GARFO 2023). It is unclear whether vessel strikes of sea turtles and sturgeon are more often from commercial vessels or smaller personal watercraft that tend to operate in shallower nearshore waters at higher speeds.

Revolution Wind (the Project) will implement this vessel strike avoidance plan for all Project vessels (including direct contract and sub-contracted) operating in the Project Area (Specified Geographic Area as defined in the LOA including to/from all regional ports in these states [MA, RI, CT, NY, NJ, VA, and MD]) to reduce the risk to the maximum extent possible of vessel strikes and the potential of death and/or serious injury to Protected Species. This Plan is submitted pursuant to Condition 5.4.7 of the Approval of the Construction and Operations Plan (COP) for the Project, the Revolution Wind Incidental Take Rule [88 FR 72562] issued by the NMFS-Office of Projected Resources (OPR) on 20 October 2023, as well as the Endangered Species Act (ESA) Section 7 Consultation Biological Opinion issued by NMFS Greater Atlantic Fisheries Office – Protected Resources Division (NMFS GARFO-PRD) on 21 July 2023. A copy of the Letter of Authorization (LOA) must be in possession of all vessel operators per LOA condition 3(a)(1). This Vessel Strike Avoidance Plan is to cover construction and operations and maintenance (O&M), but may be revisited or updated at any time to further evaluate improved technologies to align with current regulation standards. Additionally, a supplemental Vessel Strike Avoidance Plan will be provided at a later date to cover measures specific to vessel traffic during the decommissioning phase of the Project.

Revolution Wind will comply with the measures outlined in this Plan, unless an emergency situation presents a threat to health, safety, or life of a person or when a vessel, actively engaged in emergency rescue or response duties, including vessel-in-distress or environmental crisis response, requires speeds in excess of 10 knots to fulfill those responsibilities. Mitigation measures outlined within this Plan will be implemented during all Project vessel transits. A copy of this Plan will be made available on all Project vessels. Officers on watch will be briefed to ensure they understand the measures described in this Plan. The Officer on watch (vessel Captain or bridge officer currently in control of the vessel) will comply with the vessel strike avoidance measures, except under extraordinary circumstances when complying with these requirements would put the safety of the vessel or crew at risk or when a vessel is unable to maneuver and, due to the inability to maneuver, the vessel cannot comply. All instances where such an exemption is taken will be reported to the National Marine Fisheries Service (NMFS) Office of Protected Resources (OPR), NMFS GARFO – PRD, Bureau of Ocean and Energy Management (BOEM), and Bureau of Safety and Environmental Enforcement (BSEE) within 24 hours.

In addition, the Project will continue to support external initiatives to further mitigate marine traffic impacts. For example, Revolution Wind staff will attend conferences in which they will maintain

awareness and lessons learned and participate in workshops where the main focus is on the development of tools to reduce vessel strike risk.

Applicability

All Project vessels (including direct contract and sub-contracted) require Trained Lookouts. Vessel strike avoidance measures will be implemented by Trained Lookouts (see definition below) aboard all Project vessels, regardless of size, while in US waters. This includes observation at all times while a vessel is operating, at any speed (i.e., undistracted eyes on water). With the few exceptions noted below, this includes all vessel transits within the Project Area as well as during all other construction activities. The following circumstances do **not** require the implementation of vessel strike avoidance measures:

- Trained Lookouts are not required when Project vessels are underway in international waters;
- Trained Lookouts are only required at the time a vessel is under contract or sub-contract to the Project.

The measures included within this section align with the applicability requirements in LOA condition 3(b)(3), measure #13 within Appendix A of the Revolution Wind BiOp, BiOp Terms and Condition 10(f), and PDC 5, BMP 2 and 3 of the Offshore Wind Site Assessment Programmatic ESA Consultation (Appendix B to the Revolution Wind BiOp).

Trained Lookout – Role and Responsibilities

- A Trained Lookout may be a protected species observer (PSO) or a vessel crew member who has received dedicated training including how to monitor for marine mammals and sea turtles during vessel transits;
 - If the Trained Lookout is a crew member, this will be their designated role and primary responsibility while carrying out the duties of a Trained Lookout.
- All Trained Lookouts will have no other concurrent responsibilities while carrying out the duties of a Trained Lookout (e.g., transiting, surveying);
- All Trained Lookouts will communicate directly with the Officer on watch regarding all vessel strike mitigation measures (e.g., all marine mammal sightings, maintaining the vessel separation distances);
 - All project personnel (PSOs, vessel captain, and Designated Person/Work Manager [DP/WM]) will use vessel radios, instant messaging, and/or cell phones for communication.
 - Non-trained crew members will communicate directly with the Trained Lookout on watch or the Officer on watch aboard the vessel regarding any observations of protected species (Described below in the Dedicated Watch section).
- Primary responsibilities of a Trained Lookout include:
 - Review of the daily Project Protected Species Awareness Bulletin (which includes areas where protected species may be present) prior to transit. The Officer on watch will also review the Bulletin and/or the Trained Lookout and Officer on watch will discuss any information included in the Bulletin prior to vessel transit;

- Data within the Bulletin will come from WhaleMap, the Sea Turtle Sightings Hotline (<http://seaturtlesightings.org>)¹, any sightings reported by Trained Lookouts, and data from *Mysticetus* when it is being used (i.e., when PSOs are onboard for noise mitigation);
 - Observation at all times while a vessel is operating, at any speed (i.e., undistracted eyes on water) as per LOA condition 3(b)(3);
 - Facilitation of vessel strike avoidance mitigation (as described below);
 - Immediate notification to the Officer on watch, any on-duty PSOs, Passive Acoustic Monitoring (PAM) operator(s), and all vessel captains when a marine mammal or protected species is observed;
 - The Officer on watch is the person that is actively in control of the vessel. The Captain or any of the other bridge officers may act as the Officer on watch at any given time.
 - Notification to all vessel captains of any large whale observation or acoustic detection; and,
 - Data collection for any/all observations of protected species using the Project Trained Lookout Sighting form (paper or electronic completion)
 - Documentation with photos when possible.
- Confirmation of the Trained Lookouts' training and understanding of the Incidental Take Authorization (ITA) requirements will be documented on a training course log sheet by the Compliance Lead who will then report to NMFS OPR and NMFS GARFO – PRD prior to initial commencement of Project vessels involved in construction activities covered under this Plan. The Compliance Lead will report all training course log sheets for any personnel who join the Project following the commencement of vessel activity to NMFS OPR and GARFO – PRD prior to engaging in on-the-water activities.

General Vessel Strike Avoidance Measures

To mitigate potential impacts of vessel strikes, the Project will implement the following measures.

Training

- Prior to the commencement of any in-water activities related to construction activities, all personnel working offshore will receive awareness training on marine mammal, sea turtle and Atlantic sturgeon protections and vessel strike avoidance measures. Training will be conducted by a qualified person with previous experience working as a PSO, Trained Lookout, or in an environmental compliance roll. The training described below includes the Permits and Environmental Compliance Plan and a 2-day refresher session as required by LOA condition 4 (a)(14). This training will provide personnel with a basic level of understanding of why mitigation measures are required for these species and what those mitigation measures are.
- As per LOA condition 3(a)(2), Revolution Wind will provide NMFS with a description of the training program at least 60 days prior to the initial training before in-water activities begin.
- Trained Lookouts will be trained regarding vessel strike avoidance measures and any related reporting requirements per LOA Conditions 3(b)(1) and 4(g)(3)(i-xviii).

¹ The Sea Turtle Sightings Hotline website covers only sightings in New England waters. This is a source of opportunistic sightings and no sightings do not indicate that there are no turtles. The website is to increase situational awareness during vessel operations.

- Officers, PSOs, and crew members that will serve as Trained Lookouts will receive additional training (by a qualified person with previous experience working as a PSO, Trained Lookout, or in an environmental compliance roll) on the following topics related to protected species monitoring, identification, and mitigation measures:
 - Summary of applicable laws, regulations, and policies related to avoiding vessel strike of marine mammals and other protected species that may be encountered in the Project Area;
 - This will include a review of vessel strike avoidance measures in the current and proposed NOAA North Atlantic right whale (NARW) Vessel Strike Reduction Rule as well as additional specific requirements in the ITR/LOA, COP approval Terms and Conditions, or other related regulatory documents. Once the final NOAA NARW Vessel Strike Reduction Rule is published, any measures which are more restrictive than those included in the Revolution Wind LOA will be required for compliance.
 - How to make observations of protected species in both good visibility conditions (i.e., clear visibility, low wind, low sea state) and poor visibility conditions (i.e., fog, high winds, darkness, high sea states, glare).
 - Proper use of reticle binoculars and/or other tools to measure the distance to observed animals;
 - Use of night vision devices, thermal (infrared) imaging devices, or other tools that may aid in the detection of protected species at night or in poor visibility conditions.
 - Identification of protected species with an emphasis on the ability to categorize them into groups relevant to vessel strike avoidance measures.
 - Emphasis will be placed on key features to look for during a marine mammal sighting to distinguish between NARW and other large whales (e.g. lack of a dorsal fin) as well as behaviors or other environmental cues that may indicate other individuals are likely to be nearby. Any unidentified large whale that cannot be determined to not be a NARW will be treated as a NARW, and the appropriate measures will be implemented;
 - Identification resources will be present aboard all Project vessels and provided to Trained Lookouts for reference while on watch;
 - Identification of sea turtles, Sargassum lines/mats and jellyfish aggregations.
 - Knowledge surrounding all protected species' (including NARW) critical habitat requirements, migratory routes, seasonal variations, behavior identification, etc;
 - Knowledge on how and when to communicate with the vessel captain and other Project vessels.
- Trained Lookouts (crew members and PSOs) completion of the training described above will be documented in a training log which will be provided to NMFS OPR and NMFS GARFO – PRD. Additionally, they will receive a certificate from their instructor or Ørsted for their own records.
- Additional resources, such as access to the Project's Situational Awareness System, reports of recent sightings by other project vessel, Whale Alert, WhaleMap, etc. will be provided to Trained Lookouts aboard vessels and will be reviewed daily, prior to each transit, by the Trained Lookouts on watch and Officers on watch. The Project's environmental compliance team will ensure that sighting information is being distributed to each vessel and that Trained Lookouts are able to access it. The environmental compliance team will also evaluate the sighting information and make any necessary recommendations regarding vessel transits based on the sighting data.

Monitoring Equipment

- Trained Lookouts will monitor using the unaided eye and handheld reticle binoculars (7x – 10x) during good visibility conditions (i.e., during the day when no rain or heavy fog is present).
- During periods of poor visibility (e.g., darkness, rain, fog, etc.) they will use night vision devices (NVDs) and/or thermal (infrared) devices, as appropriate.
 - All NVDs and/or thermal devices will at a minimum be able to monitor out to the 500 m clearance zone during all vessel transits.

Dedicated Watch

- Trained Lookouts will keep their eyes on the water at all times while on watch, with the exception of entering data for a sighting;
 - When the Trained Lookout is entering data, the Officer on watch will maintain a dedicated watch for protected species. The Trained Lookout will be located on the bridge with the Officer on watch and will verbally notify the Officer on watch when entering data. If the Trained Lookout is conducting watch from a location separate from the Officer on watch, they will use the communication method established for that vessel (e.g., handheld radio, onboard phone system, messaging app, etc.) to notify them when entering data.
 - Trained Lookouts may not use or check personal electronic devices while on watch.
- Visual monitoring will focus in the forward 180° direction of the vessel's path (90° port to 90°starboard) with observers located at an appropriate vantage point to ensure vessels are maintaining required separation distances (as described below) for marine mammals and sea turtles.
 - Trained Lookouts will scan all directions to ensure that no protected species is within the required separation distance at any location surrounding the vessel.
 - Trained Lookouts and Officer on watch will communicate if any turns/changes of direction (e.g., line changes during a survey) are planned so the Trained Lookout can ensure 360° monitoring leading up to any change in direction.
- Trained Lookout shifts will vary depending on vessel crew schedules and the activity/movement of the vessel. When the crew schedule requires a Trained Lookout to conduct other responsibilities aboard the vessel they will be replaced by another Trained Lookout such that there is no gap in monitoring coverage.
- All visual observations of marine mammals or other protected species made by Trained Lookouts will be communicated by the Trained Lookout or Officer on watch aboard the vessel from which the detection was made to the Trained Lookouts and Officers on watch aboard all other Project vessels. When a non-trained crew member observes a protected species, they will report the sighting to the Trained Lookout on watch or the Officer on watch aboard the vessel from which the detection was made.
 - If an Officer on watch receives an announcement of a marine mammal or other protected species observation aboard another vessel, they will immediately notify the Trained Lookout on watch aboard their own vessel.

Situational Awareness/Common Operating Picture

- The Project will establish a situational awareness network for marine mammals and other protected species detections through the use of sighting communication tools (as described below) such as Mysticetus, Whale Alert, WhaleMap, and the Right Whale Sighting Advisory System (RWSAS) etc;

- The marine mammal monitoring team (which includes PSOs, PAM operators, vessel operators, and trained crew members) will monitor such tools at the onset of transiting and no less than every 4-hours or whenever a new marine mammal monitoring team personnel goes on duty;
- When only Trained Lookouts are onboard they will check daily for information regarding the establishment of mandatory or voluntary vessel strike avoidance areas (i.e., Seasonal Management Area (SMA), Dynamic Management Area (DMA), and acoustically-triggered Slow Zones) and any information regarding NARW sighting locations;
- Trained lookout will monitor <https://seaturtlesightings.org/> between June 1 and November 30 prior to each vessel trip and report any observation of sea turtles in the vicinity of the planned transit to all Officers on watch and Trained Lookouts on duty that day;
- Protected Species sighting information will be made available to all project vessels through the established network;
 - This communication will be facilitated through a dedicated VHF radio channel for all observations of protected species, and via the Mysticetus software system when in use;
 - Revolution Wind Project managers and Mysticetus software will pull non-project sighting information from various marine mammal data sources (e.g., New England Aquarium, Blue Ocean Society) to inform all Project vessel teams of protected species activity relevant to the Project Area and Project operations.
- The Project Marine Coordination Center will serve to coordinate and maintain a Common Operating Picture including a Daily Protected Species Awareness Bulletin;
 - The Revolution Wind environmental compliance team will compile a Daily Protected Species Awareness Bulletin for distribution to all Project vessels each morning;
 - The Bulletin will summarize locations of recent NARW detections and Slow Zones, known locations of other protected species in the Project Area, and other information relevant to promoting protected species awareness across all offshore Project operations.
 - The Trained Lookout and Officer on watch will review the bulletin each morning and discuss any information included in the Bulletin prior to vessel transits.
- In addition, personnel within the Marine Coordination Center, along with Trained Lookouts, will:
 - Monitor the Project’s Situational Awareness System;
 - Monitor the NMFS NARW reporting systems;
 - Continuously monitor the U.S. Coast Guard VHF Channel 16 over which notifications of NARW Slow Zones (DMAs and acoustically-triggered Slow Zones) are broadcast;
 - NMFS information systems such as RWSAS; and,
 - Monitor any existing real-time acoustic networks.
- Any NARW or large whale detection will be immediately communicated by the Trained Lookout or Officer on Watch aboard the vessel from which the detection was made to the Trained Lookouts and Officers on Watch aboard all other Project vessels via the situational awareness network and/or the dedicated VHF channel.

Speed and Approach Constraints

Trained Lookouts, Officers on watch and crew, regardless of their vessel’s size, will maintain a vigilant watch for marine mammals and other protected species as described above and slow down, stop, or maneuver their vessels as appropriate to avoid a potential interaction with a marine mammal or other protected species. An example large whale sighting decision chart is provided in Attachment 1.

Speed Constraints

Project vessels will adhere to current mandatory measures stipulated in the NOAA NARW Vessel Strike Reduction Regulations. Once the final NOAA NARW Vessel Strike Reduction Rule is published, any measures which are more restrictive than those included in this Plan and the Revolution Wind Final Incidental Take Rule will be required for compliance.

- All vessels, regardless of size, will transit at 10 knots or less within any active NARW SMA and Slow Zone (i.e., DMA or acoustically-triggered Slow Zones).
- **Between November 1st and April 30th:** All project vessels, regardless of size, will operate at 10 knots or less when in the Project Area, except for vessels transiting in Narragansett Bay or Long Island Sound.
- **Between May 1st and October 31st:** All project vessels, regardless of size, will operate at 10 knots or less when in the Project Area, except for vessels transiting in Narragansett Bay or Long Island Sound.
 - At this time, Revolution Wind does not intend to establish a transit corridor monitored by PAM during this period and will limit vessel speeds to 10 knots or less (see Passive Acoustic Monitoring section below).
- All vessels, regardless of size, will immediately reduce speeds to 10 knots or less for at least 24 hours when a NARW is sighted at any distance by any project-related personnel or acoustically detected by any project-related PAM system.
 - Each subsequent observation or acoustic detection in the Project Area will trigger an additional 24-hour period of operating at 10 knots or less;
 - If a NARW is reported through any of the monitoring systems (described in the previous section) within 10 km of a transiting vessel(s), that vessel will operate at 10 knots or less for 24-hours following the reported detection.
- All vessels, regardless of size, will immediately reduce speed to 10 knots or less when any large whale (other than a NARW) is observed within 500 m of an underway vessel;
- Vessel captains/operators will avoid transiting through areas of visible jellyfish aggregations or floating Sargassum lines or mats. In the event that operational safety prevents avoidance of such areas, vessels will reduce speed to 4 knots while transiting through such areas;
- Speed over ground will be used as the unit of measure for all vessel speed restrictions.

Passive Acoustic Monitoring (PAM) Transit Corridor Measures

Prior documents submitted as part of the Incidental Take Authorization process (e.g., ITR Application and PSMMP) have described a potential acoustic monitoring program that would be used in combination with visual observers to allow vessels 65 ft or longer to travel at >10 knots within certain areas and times where they would otherwise be restricted to 10 knots or less. After further exploring the implementation of such an acoustic monitoring program the Project has determined that, at this time, it will not pursue this alternative and therefore all vessels, regardless of size, will adhere to the 10-knot speed restriction. Should circumstances change this current determination by the Project, this Plan would be revised and re-submitted to include a detailed description of the methods and procedures related to PAM monitoring of a vessel transit corridor that would allow, should NMFS approve the proposed Plan, vessels to transit at >10 knots outside of active SMAs, DMAs, or acoustically-triggered Slow Zones.

Approach Constraints

Vessels will avoid approaching marine mammals as described below. Additionally, Table 1 includes a summary of the relevant species-specific separation distances.

All Species

- All attempts will be made to remain parallel to the animal's course when a travelling marine mammal is sighted in proximity (outside of the relevant separation distances) to the vessel in transit;
- All vessels underway will not divert or alter course in order to approach a marine mammal or other protected species;
- Any vessel underway will avoid excessive speed or abrupt changes in direction until the animal has left the area;
 - This measure does not apply to any vessel in a situation where respecting the relevant separation distance would be unsafe (i.e., any situation where the vessel is navigationally constrained).

Exceptions

- Limitations on approach do not apply where compliance would create an imminent and serious threat to a person, vessel, or aircraft;
- Limitations on approach do not apply when approaching to investigate an entanglement or injury, or to assist in the disentanglement or rescue of a whale, provided that permission is received from NMFS or a NMFS designee prior to the approach;
 - Revolution Wind will report any entangled or injured whale to NMFS and stand by (i.e., do not attempt to closely approach or physically interact with the whale, but remain close enough to the whale to track its position) if asked to do so until the stranding or disentanglement team arrives.
- Limitations on approach do not apply to the extent that a vessel is restricted in its ability to maneuver, and because of the restriction, cannot comply with the limitation on approach. Vessels with limited maneuverability will make all efforts to safely maintain separation distances.
 - Given the unforeseen circumstance of reduced maneuverability, the vessel will reduce speed and/or shift engine to neutral (where possible);
 - Additionally, the vessel will attempt to comply by using various methods (to the extent feasible) including, but not limited to:
 - Attempting to remain parallel to any animal sighted within the course of the vessel;
 - Not diverting or altering course in order to approach a marine mammal or other protected species; and,
 - Avoiding excessive or abrupt changes in direction until the sighted animal has left the area.
- All instances wherein an exception is taken will be reported to NMFS OPR within 24 hours.

North Atlantic Right Whale

- All vessels will maintain a minimum separation distance of 500 m from NARWs;
- If underway, a vessel will steer a course away from any sighted NARW at a distance greater than 500 m from the vessel and immediately leave the area at a slow safe speed (10 knots or less);
- If a NARW is sighted within 500 m of an underway vessel, that vessel will reduce speed and shift the engine to neutral;

- Engines will not be engaged until the NARW has moved outside of the vessel's path and beyond 500 m;
- If a whale is observed but cannot be confirmed as a species other than a NARW, the Officer on watch will assume that it is a NARW and take appropriate actions as described in this section;
- Exceptions stated in the "All Species" section above are applicable for NARW.

Other ESA-Listed Whales²

- All vessels will maintain a minimum separation distance of >500 m from all ESA-listed whales or unidentified large marine mammal;
- If an ESA-listed whale or large unidentified whale (that is not a NARW) is observed within 500 m of the forward path of the vessel, the Officer on watch will steer a course away from the whale at 10 knots or less until the 500 m minimum separation distance has been established. Vessels may also shift to idle, if feasible;
- If an ESA-listed whale (that is not a NARW) is sighted within 200 m of the forward path of the vessel, the Officer on watch will reduce speed and shift the engine to neutral. Engines will not be engaged until the whale has moved outside the vessel's path and beyond 500 m;
- Exceptions stated in the "All Species" section above are applicable for ESA-listed whales.

Other Non-ESA-listed Baleen Whales

- All vessels will maintain a minimum separation distance of 100 m from non-ESA-listed baleen whales;
- If a non-ESA-listed baleen whale is sighted within 100 m of a transiting vessel, that vessel will shift the engine to neutral. Engines will not be engaged until the whale has moved outside the vessel's path and beyond 100 m;
- Exceptions stated in the "All Species" section above are applicable for non-ESA-listed baleen whales.

Dolphins, porpoises, seals, sea turtles, manta rays, and ESA-Listed Fish

- All vessels will, to the maximum extent practicable, attempt to maintain a minimum separation distance of 50 m from all delphinid cetaceans and pinnipeds with an exception made for those that approach the vessel (e.g., bow-riding dolphins);
- If a delphinid cetacean that is not bow riding or a pinniped is sighted within 50 m of an underway vessel, that vessel will shift the engine to neutral. Engines will not be engaged until the animal(s) has moved outside of the vessel's path and beyond 50 m;
- Vessels will avoid, to the extent practicable, transiting through visible jellyfish aggregations and floating *Sargassum* lines or mats. In the event that operational safety prevents avoidance of such areas, vessels will slow to 4 knots while transiting through such areas;
- If a sea turtle or manta ray is sighted within 100 m or less of the operating vessel, the Officer on watch will slow down to 4 knots and steer away (unless unsafe to do so). The vessel will then proceed away from the sea turtle or manta ray at a speed of 4 knots or less until there is a separation distance of at least 100 meters at which time the vessel may resume normal operations;
- If a sea turtle is sighted within 50 m of the operating vessel, the Officer on watch will shift the engine to neutral when safe to do so and wait for the turtle to pass beyond 50 m and then engage

² The mitigation measures listed within this section are based on those required within the Revolution Wind Biological Opinion (BiOp). Specifically, these measures can be found under PDC #5 Best Management Practices.

engines and travel away from the turtle at a speed of 4 knots until a separation distance of 100 m is observed;

- The vessel will resume normal operations once it has passed the turtle.
- Vessels operating in water depths with less than four feet of clearance between the vessel and the bottom should maintain speeds no greater than 4 kts to minimize risk of vessel strikes on Atlantic sturgeon and sawfish;
- Exceptions stated in the “All Species” section above are applicable for dolphins, porpoises, seals, sea turtles, manta rays, and ESA-Listed Fish.

Table 1. Summary of the required species-specific separation distances.

Species	Separation Distance
NARW + other ESA-listed whales	
<ul style="list-style-type: none"> ● NARW ● Fin whale ● Sei whale ● Sperm whale ● Blue whale 	500 m
Non-ESA listed baleen whales	
<ul style="list-style-type: none"> ● Minke whale ● Humpback whale 	
Sea turtles and manta ray	
<ul style="list-style-type: none"> ● Green sea turtle ● Kemp's Ridley Sea turtle ● Loggerhead sea turtle ● Leatherback sea turtle 	100 m
Dolphins*, porpoises, seals*, and ESA-listed fish	
<ul style="list-style-type: none"> ● Atlantic sturgeon ● Shortnose sturgeon 	50 m

* There is an exception to maintaining the relevant separation distance for those delphinid cetacean and pinniped species that approach the vessel (e.g., bow-riding dolphins).

Reporting

Revolution Wind will use a standardized reporting system during the effective period of the LOA. All data will be recorded using industry-standard software that is installed on field laptops and/or tablets. All vessels will be equipped with a properly installed operational Automatic Identification System (AIS) device and Revolution Wind will report all Maritime Mobile Service Identify (MMSI) numbers to NMFS OPR prior to initiating in-water activities. Any protected species sightings (as described below) will be included within the monthly reports submitted to NMFS OPR and NMFS GARFO – PRD on the 15th of the month for the previous month. All reporting will comply with COP approval, LOA, and BiOp conditions.

Data Collection – Monitoring Effort, Sightings, and Operations

For all visual monitoring efforts and protected species sightings, the following information will be collected by PSOs. A sequential identification number (ID) unique to each vessel will be assigned to each new marine mammal sighting with multiple sightings of the same animal or group given the same ID. The following information will be collected for each sighting as soon as possible:

- Date and time the monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Watch status (i.e., sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform);
- PSO who sighted the animal (last, first) and number of PSOs on watch;
- Date and Time of start and end of sighting (YYYY-MM-DD, hh:mm:ss (UTC)) and duration of observation;
- Weather parameters (e.g., wind speed (knots), wind direction, percent cloud cover, visibility (km), precipitation, glare);
- Water conditions (Beaufort sea state, tidal state including swell height (m), swell height (meters), water depth (m));
- Identification of the animal(s) with degree of certainty (i.e., genus/species, lowest possible taxonomic level, or unidentified); also note the composition of the group if there is a mix of species;
- Pace of the animal(s);
- Estimated number of animals (minimum/maximum/high/low/best);
- Estimated number of animals by cohort (e.g., adults, yearlings, juveniles, calves, group composition);
- Description (i.e., as many distinguishing features as possible of each individual seen, including length, shape, color, pattern, scars or markings, shape and size of dorsal fin, shape of head, and blow characteristics);
- Description of behavior (e.g., such as feeding or traveling), including an assessment of behavioral responses thought to have resulted from the activity (e.g., no response or changes in behavioral state such as ceasing feeding, changing direction, or breaching). If bow-riding, record duration;
- Animal's closest distance (reticle distance in meters) from observational vessel and estimated time spent (time entering and leaving (UTC HH:MM) and seconds duration) within the Level A / PTS zone, or Level B / behavioral harassment zone, and/or shutdown zone (specify radius in m) and times when these closest approaches occurred (UTC HH:MM);
- Distance (meters) and bearing (relative to ship heading or "clock face") to each animal observed and the animal's direction of travel (relative to vessel as well as initial and final heading in degrees);
- Construction activity at time of sighting (i.e., impact pile driving), use of any NAS, and specific phase of activity (e.g., ramp-up of HRG equipment, HRG acoustic source on/off, soft-start for pile driving, active pile driving etc.);
- Description of any mitigation-related actions implemented, or mitigation-related actions called for but not implemented, in response to the sighting (e.g., delay, shutdown, etc.) and time and location of the action;
- Location of observer (latitude and longitude in decimal degrees) and compass heading of vessel (degrees);
- Animal occurrence within Level A harassment or Level B harassment zones;

- Other human activity in the area;
- Other applicable information.

For all visual monitoring efforts and protected species sightings, the following information will be collected by non-PSO Trained Lookouts.

- Sighting number;
- Vessel Name;
- Sighting date (Eastern Local) (YYY-MM-DD);
- Time (Eastern Local) (HH:MM);
- Species;
- Number of animals;
- Requested mitigation;
- Initial sighting distance (m);
- Closest approach to vessel;
- Bearing to sighting;
- Vessel activity;
- Vessel heading;
- Vessel speed (kts);
- Beaufort sea state;
- Water depth (m);
- Visibility (km);
- Vessel latitude and longitude;
- Injured, entangled, or dead;
- VHF Channel 9 alert;
- Comments.

Situational Reporting

- All visual observations of marine mammals and other protected species will be shared with other Project vessels, as soon as feasible.
 - Details regarding communication of sighting information can be found above within the Situational Awareness/ Common Operating Picture section.
- If personnel involved in the Project discover a stranded, entangled, injured, or dead protected species (including sea turtles and sturgeon), Revolution Wind will report the observation as soon as feasible, but no later than 24 hours from the sighting to NMFS SAS (866-755-6622), NMFS OPR (PR.ITP.MonitoringReports@noaa.gov) and NMFS GARFO – PRD (nmfs.gar.incidental-take@noaa.gov).
 - The report (via phone or email) will include contact (name, phone number etc), the time, date, and location (latitude/longitude in decimal degrees) of the first discovery (and updated location information if known and applicable); species identification (if known) or description of the animal(s) involved; condition of the animal(s) (including carcass condition if the animal is dead), observed behaviors of the animal(s), if alive; if available,

- photos or video footage of the animal(s); and general circumstances under which the animal was discovered.
- Staff responding to the hotline call will provide any instructions for handling or disposing of any injured or dead animals, which may include coordination of transport to shore, particularly for injured sea turtles.
 - If a protected species (including a sea turtle or sturgeon) is injured or killed as a result of vessel strike (caused by activity), Revolution Wind will report the strike incident to the NMFS OPR, NMFS GARFO – PRD, and BSEE immediately, no later than within 24 hours.
 - Any Project activity resulting in a vessel strike incident (e.g., landfall construction, HRG survey activity, foundation installation, or UXO/MEC detonation) will cease immediately until NMFS OPR is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate before continuing operations.
 - Immediate notification to the MHCC (401-868-1301).
 - Report to NMFS SAS (866-755-6622); PR.ITP.MonitoringReports@noaa.gov; NMFS OPR (301-427-8401); NMFS GARFO – PRD by email at nmfs.gar.incidental-take@noaa.gov; BSEE (ProtectedSpecies@BSEE.gov); and USCG;
 - The report will include the time (note time format), date, and location (latitude and longitude in decimal degrees) of the incident; species identification (if known) or description of the animal(s) involved; vessel size and motor configuration (inboard, outboard, jet propulsion); vessel's speed leading up to and during the incident; vessel's course/heading and what operations were being conducted (if applicable); status of all sound sources in use; description of avoidance measures/requirements that were in place at the time of the strike and what additional measures were taken, if any, to avoid strike; environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, visibility) immediately preceding the strike; estimated size and length of animal that was struck; description of the behavior of the marine mammal immediately preceding and following the strike; if available, description of the presence and behavior of any other marine mammals immediately preceding the strike; estimated fate of the animal (e.g., dead, injured but alive, injured and moving, blood or tissue observed in the water, status unknown, disappeared); and to the extent practicable, photographs or video footage of the animal(s).
 - Any NARW sighting by PSOs, or project personnel will be reported as soon as feasible and no later than within 24 hours to the NMFS and Right Whale Sighting Advisory System (RWSAS) hotline (888-755-6622) or via the WhaleAlert App, NMFS GARFO – PRD, BSEE, and USCG (via channel 16).
 - The sighting report will include the time, date, and location of the sighting, number of whales, animal description/certainty of sighting (photos/video if taken), Lease Area/project name, PSO/personnel name, PSO provider company (if applicable), and reporter's contact information.
 - Revolution Wind will submit a summary report to NMFS GARFO – PRD (nmfs.gar.incidental-take@noaa.gov), NMFS OPR, and NMFS Northeast Fisheries Science Center (NEFSC); ne.rw.survey@noaa.gov within 24 hours with the above information and vessel/platform from which the sighting was made, activity the vessel/platform was engaged at time of sighting, project construction and/or survey activity at the time of sighting, distance from vessel/platform to sighting at time of detection, and any mitigation actions taken in response to the sighting.

- If an observation of a large whale occurs during vessel transit, Revolution Wind will report the time, date, and location of the sighting the WhaleAlert app (<http://www.whalealert.org/>) within 24 hours;
- If Project vessels are unable to maintain the minimum separation distance for marine mammals due to an emergency situation, this incident will be reported to BSEE, NMFS OPR, and NMFS GARFO – PRD within 24 hours.
- If Project vessels transit through visible jellyfish aggregations, Sargassum, or within the designated separation distance for sea turtles due to an emergency situation, this incident will be reported to BSEE and NMFS GARFO – PRD within 24 hours.

Paulsboro Marine Terminal Reporting

As per BiOp Terms and Conditions 4(a), (b), (c) and (d), BOEM and BSEE require compliance with the following reporting requirements.

- Revolution Wind will document and report the number of vessel calls to the Paulsboro Marine Terminal. This will be included in the monthly project reports submitted to NMFS GARFO – PRD (as described below) over the life of the Project;
- In compliance with the Terms and Conditions of the July 19, 2022 Paulsboro Biological Opinion and any subsequent Opinion or amended ITS that results from reinitiation of the 2022 Opinion, no later than March 1 of each year, Revolution Wind will report the number of vessel port calls to Paulsboro Marine Terminal in the previous year by month. This report will also include the type of vessel and its draft;
 - Reports will be filed with the USACE Philadelphia District (NAPRegulatory@usace.army.mil) and NMFS GARFO – PRD (nmfs.gar.incidental-take@noaa.gov)
- Report any sturgeon observed with injuries or mortalities in the Paulsboro Marine Terminal Area to NMFS within 24 hours using the form available at <http://media.fisheries.noaa.gov/2021-07Take%20Report%20Form%2007162021.pdf?null>;
- Hold any dead sturgeon in cold storage until proper disposal procedures are discussed with NMFS GARFO – PRD;
- Complete procedures for genetic sampling of any dead Atlantic sturgeon that are over 75 cm. Reference RPM 4, Term and Condition 6 of the 2022 Paulsboro BiOp (NMFS GARFO 2022);
- Monthly Reporting As per LOA condition 4(g)(5), Revolution Wind will submit monthly reports to NMFS OPR including a summary of all vessel transits (e.g., number, type of vessel, MMSI number, route, marine mammals observed during vessel transits, any mitigative action(s) required during those transits and circumstances requiring the action(s) and any other relative information);
- Monthly reports will be submitted on the 15th of the month for the previous month.

Annual Reporting

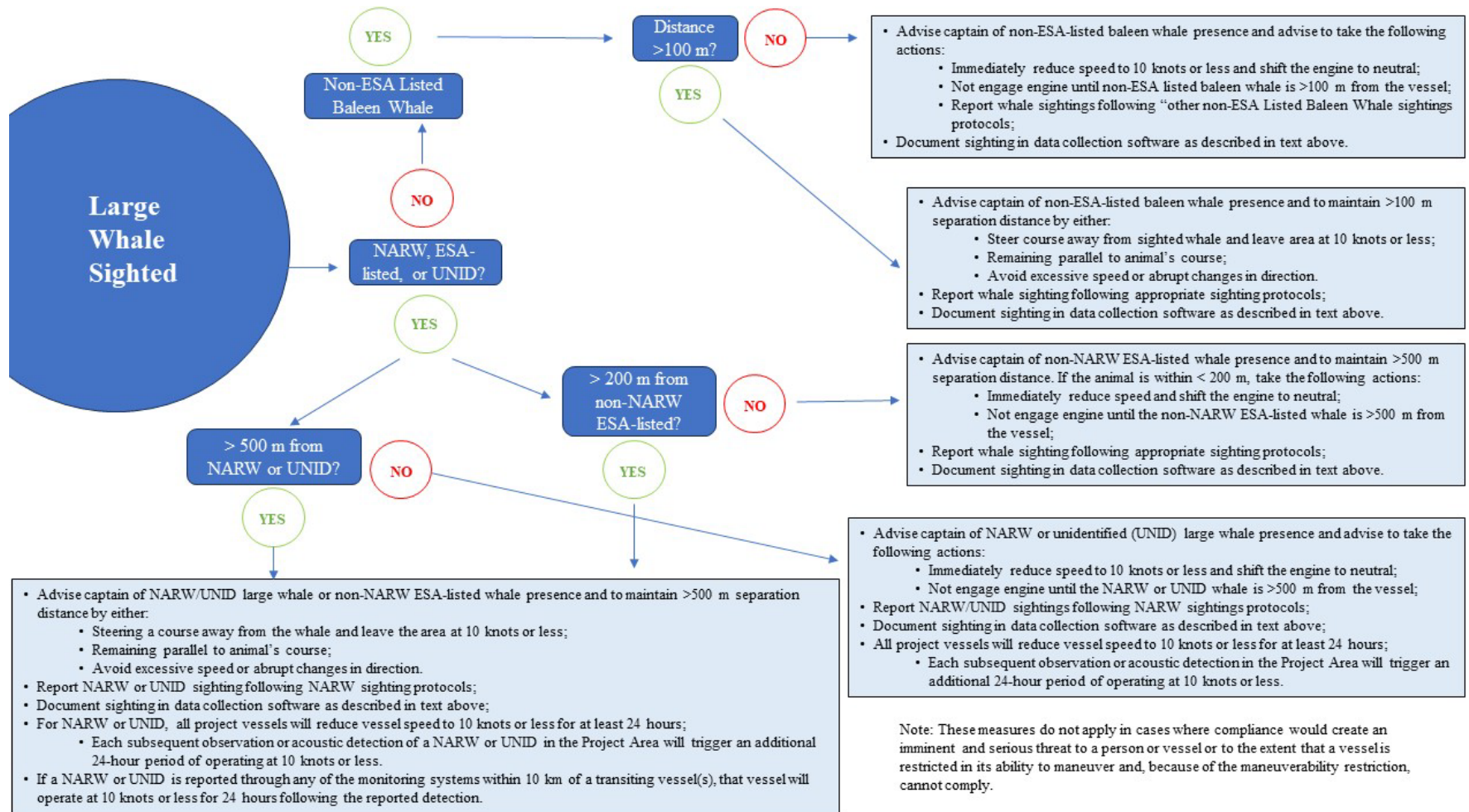
- As per LOA condition 4(g)(6), Revolution Wind will submit a draft annual report to NMFS OPR no later than 90 days following the end of a calendar year.
- Revolution Wind will provide a final report within 30 days following resolution of NMFS' comments on the draft report.
- The draft and final reports will include:

- The total number of marine mammals of each species/stock detected and how many were detected within the designated Level A harassment and Level B harassment zone(s) with comparison to authorized take of marine mammals for the associated activity;
- Marine mammal detections and behavioral observations before, during, and after each activity;
- What mitigation measures were implemented or, if no mitigative actions were taken, why not;
- Operational details (e.g., days and amount of HRG survey effort);
- The results, effectiveness and which noise attenuation systems were used;
- Summarized information related to situational reporting;
- Any other important information relevant to the Project.

5-year Report

- As per LOA condition 4(g)(7), Revolution Wind will submit a draft 5-year report to NMFS OPR on all visual and acoustic monitoring conducted within 90 calendar days of the completion of activities occurring under the LOA;
- A 5-year report will be prepared and submitted within 60 calendar days following receipt of any NMFS OPR comments on the draft report. If no comments are received from NMFS OPR within 60 calendar days of NMFS OPR receipt of the draft report, the report will be considered final.
- Specific information to be included within the 5-year report is described in LOA condition 4(g)(7).

Attachment 1: Large-whale Sighting Decision Chart³



³ Any NARW or large whale detection will be immediately communicated by the Trained Lookout or Officer on Watch aboard the vessel from which the detection was made to the Trained Lookouts and Officers on Watch aboard all other Project vessels via the situational awareness network and/or the dedicated VHF channel.

Literature Cited

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- NMFS GARFO. 2022. National Marine Fisheries Service Endangered Species Act Biological Opinion USACE Permit for the Development of the Paulsboro Marine Terminal Roll-on/Roll-off Berth (NAP-2007-1125-39).
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- NOAA Fisheries. 2020. North Atlantic Right Whale (*Eubalaena glacialis*) Vessel Speed Rule Assessment June 2020 NOAA Fisheries, Office of Protected Resources.
- Nowacek, D. P., M. P. Johnson, P. L. Tyack, K. A. Shorter, W. A. McLellan, and d. A. Pabst. 2001. Buoyant balaenids: the ups and downs of buoyancy in right whales. *Proceedings of the Royal Society of London B* 268:1811-1816.
- Parks, S. E., J. D. Warren, K. Stamieszkin, C. A. Mayo, and D. N. Wiley. 2012. Dangerous dining: surface foraging of North Atlantic right whales increases risk of vessel collisions. *Biology Letters* 8:57-60.