

A.I.S., Inc.
Protected Species Monitoring

**PROTECTED SPECIES MONITORING SERVICES
DURING GEOPHYSICAL SURVEY
OF SKIPJACK WIND
FINAL REPORT**



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Confidentiality

The information summarized in this Final Report was collected by A.I.S., Inc. for Geodynamics and Ørsted to be distributed to the National Marine Fisheries Service and Bureau of Ocean Energy Management as required by the Incidental Harassment Authorization granted to Ørsted on May 10th, 2023, and the BOEM BMPs and PDCs.

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LIST OF ABBREVIATIONS

AIS	A.I.S. Inc.,
BOEM	Bureau of Ocean Energy Management
BOEM PDCs and BMPs	BOEM Project Design Criteria and Best Management Practices for Protected Species Associated with Offshore Wind Data Collection
ECR	Export Cable Route
FWS	Fish and Wildlife Service
ESA	Endangered Species Act
Geodynamics	Geodynamics LLC
HRG	High Resolution Geophysical
IHA	Incidental Harassment Authorization
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
NARW	North Atlantic right whale
Ørsted	Ørsted Wind Power North America, LLC,
PSO	Protected Species Observer
PECP	Permitting and Environmental Compliance
SJW	Skipjack Wind
Shackelford	Research vessel Shackelford

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1. EXECUTIVE SUMMARY

This Final Protected Species Monitoring Report (Final Report) is submitted on behalf of Ørsted Wind Power North America, LLC, (Ørsted). This report has been prepared in accordance with the final reporting requirements for the Bureau of Ocean Energy Management (BOEM) Project Design Criteria and Best Management Practices for Protected Species Associated with Offshore Wind Data Collection (BOEM PDCs and BMPs) dated November 22, 2021, BOEM Section 7 Letter of Concurrence (LOC) issued June 29, 2021 and the Incidental Harassment Authorization (IHA) (IHA; 88 fr 30278) issued by the National Marine Fisheries Service (NMFS) with effective dates of May 10, 2023 – May 9, 2024. Final data collected during September and October site investigation surveys for the Skipjack Wind (SJW) Project are contained herein. Additionally, it includes summaries of SJW offshore vessel operations, associated detections of protected species made by Protected Species Observers (PSOs) and any mitigation actions necessary during High Resolution Geophysical (HRG) survey activities. All SJW PSO data collected during this campaign is attached to this report in a Microsoft Excel .xlsx file. These data include additional project, operational, and protected species detection details beyond what is summarized in the body of the report. This survey work was conducted under the re-issued IHA (IHA; 88 fr 30278) and the BOEM PDCs and BMPs. To comply with IHA requirements, Geodynamics LLC (Geodynamics) contracted A.I.S., Inc. (AIS) to provide PSOs to monitor for marine mammals and sea turtles during on-water survey operations. This survey effort was the only one undertaken during the 2023 calendar year for SJW and thus this report will fulfill both the final protected species monitoring report requirements for BOEM under the BOEM BMPs and PDCs as well as the comprehensive final report submission requirements from NMFS under the IHA.

Survey operations were conducted for a period of 30 calendar days, between September 10th and October 27th, 2023. Due to the potential for harassment of listed or otherwise protected marine species as a result of the sound generated by HRG survey operations, two (2) AIS PSOs were deployed to Ocean City, MD to monitor sound producing operations onboard the R/V Shackelford. The PSOs monitored in accordance with regulations set forth within the IHA. There were 194 marine mammal and sea turtle sightings during this deployment, consisting of an estimated 1536 individual animals, the majority of which was completed during generally favorable environmental conditions. There was one (1) solitary humpback whale that triggered shutdown mitigation measures to be enacted, two detections of groups of bottlenose dolphins that encroached within the 141 Level B Harassment Zone and meet the criteria of takes and finally, two (2) solitary loggerhead sea turtles that required vessel strike avoidance mitigation. In total, due to the humpback triggered shutdown, there were 10 seconds of downtime due to protected species.

Table 1 HRG Survey Campaign Overview

Client	Ørsted Wind Power North America, LLC
Lease Area	OCS-A 0482 and OCS-A 0519
Survey Area	Export Cable Route, offshore Delaware
Dates	September 10, 2023 - October 27, 2023
HRG Survey Contractor	Geodynamics LLC
Protected Species Observer Contractor	A.I.S., Inc.
Protected Species Observers	Richard Holt and Preston White

2. INTRODUCTION

The Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) were enacted to protect endangered species and marine mammals respectively, and both prohibit the "taking" of these animals. Taking is defined as harassing, harming, perusing, shooting, wounding, trapping, hunting, capturing, collecting, killing or attempting to harass, harm, pursue, shoot, wound, trap, hunt, capture, collect, or kill marine mammals or endangered species. There are two types of harassment induced incidental "takes", Level A and Level B. Level A takes occur when protected animals or stocks are physically injured; alternatively Level B takes occur when other disturbances to known behavioral patterns (breathing, feeding, nursing, etc.) are the result of activities transpiring within protected animal habitats.

Both the ESA and the MMPA are administered by the National Oceanic and Atmospheric Administration (NOAA), NMFS and United States Fish & Wildlife Service (FWS). These agencies issue authorizations for activities that have the potential to incidentally "take" by harassment members of an endangered species. The federal government issues authorizations for takes for important activities, in this case HRG surveys, in support of offshore wind development, to occur without the express purpose of affecting protected species but which could have impacts on those species. These impacts must be tracked and reported to the federal government for species management purposes.

Under section 7 of the ESA, federal agencies are required to consult with NOAA and U.S. FWS if the authorized activities that are being undertaken may adversely affect or result in an incidental take of protected or endangered species (NOAA Fisheries, 2023). In accordance with section 7, a programmatic consultation between BOEM and NMFS for offshore wind data collection was completed. This consultation resulted in Project Design Criteria (PDCs) and Best Management Practices (BMPs) associated with the mitigation, monitoring, and reporting conditions being developed for those data (US Dept of the Interior, BOEM, Office of Renewable Energy Programs Atlantic OCS Region, 2021). The NMFS issues IHA's with required mitigation measures to prevent harassment of protected species and authorizes only a certain amount of incidental take to ensure no population level impacts. IHAs are issued under the MMPA and therefore include only marine mammals, while Section 7 takes place under the ESA which covers both endangered marine mammals and sea turtles.

Ørsted was issued an IHA for activities related to HRG surveys within the offshore lease areas OCS-A 0482 and OCS-A 0519 and associated export cable routes (US Dept. of Commerce, NOAA, NMFS, 2023). The HRG survey described herein was focused on potential inshore export cable routes (ECRs) located in coastal Delaware. This IHA outlined the monitoring, mitigation, and reporting requirements for fifteen local marine protected species, with additional requirements laid out for reporting sightings of North Atlantic Right Whales (NARW) *Eubalaena glacialis*. These were species specific to the area with the highest potential to be affected by acoustic disturbance from planned in-water operations. IHA's issued by NMFS do not include sea turtle protections, thus the BOEM PDCs and BMPs, developed as a result of a programmatic section 7 consultation for offshore wind data collection and includes both endangered marine mammals and sea turtles, for Protected Species Associated with Offshore Wind Data Collection, were utilized as a guide for mitigation actions for sea turtles. While no Level A takes were anticipated or authorized for this survey some Level B, behavioral disturbance, takes were allocated. More information on Level B takes can be found in Appendix D.

3. PROTECTED SPECIES OBSERVATION METHODS

PSO monitoring and mitigation measures were designed to minimize potential impacts of sound produced by HRG survey operations on protected species and were implemented in accordance with the IHA, BOEM PDCs and BMPs and specific client requirements. The training, observation methods and mitigations measures associated with these operations are outlined below.

3.1. Protected Species Observer Training and Compliance

A team of two (2) NMFS-approved PSOs were provided by AIS for monitoring aboard Geodynamics' R/V Shackelford (Shackelford) during HRG survey operations along the potential SJW export cable routes in BOEM Lease Area OCS-A 0482 and OCS-A 0519. All PSOs attended a dedicated SJW Permitting and Environmental Compliance (PECP) training course on September 8, 2023, prior to the deployment. Individual PSO team members were Richard Holt (NMFS unconditionally approved visual and/or acoustic Lead PSO) and Preston White (NMFS conditionally approved visual PSO). PSO training involved a detailed review of the following:

- Permits relevant to the project
- Environmental compliance requirements
- Health and safety requirements
- PSO requirements and scheduling
- Listed and Protected species mitigation methods
- Communication
- Data forms
- Use and maintenance of PSO equipment
- Protected species identification

3.2. Monitoring Methods and Equipment

To fulfill protected species monitoring and mitigation requirements the two PSOs deployed offshore on the Shackelford and rotated monitoring shifts. Watches occasionally overlapped but never exceeded the regulatory requirements. In accordance with the regulatory and client requirements, at least one (1) visual observer maintained a 360° visual watch of the exclusion zone surrounding the operational area during daylight hours. There were no nighttime operations during this survey. PSO duties included:

- Working in shifts to ensure that each individual does not exceed four consecutive hours of watch followed by a minimum of a two-hour break and working no more than 12 hours per 24-hour period.
- Maintaining vigilant watch for marine protected species and communicating any sightings in the forward path of the vessel to operators during all vessel transits, ensuring strike avoidance measures were met.
- Visually monitoring the clearance and exclusion zones 360° around the sound source during survey operations for the presence of marine protected species (marine mammals, sea turtles and ESA listed fishes).
- Documenting all marine protected species sightings, observer effort, and environmental conditions on standard data forms and reporting all incidents to proper personnel.
- Recording operational activities during monitoring effort.
- Informing vessel and survey operators if a protected species is heading towards the exclusion zone.

- Calling for a delay or shutdown if a marine protected species is observed entering or surfaces within the exclusion zone.
- Advising operators on mitigation requirements in the event of marine protected species detections.
- Ensuring all mitigations actions (pre-start clearance, delay ramp-up, ramp-up and shutdown) are enacted.
- Summarizing daily monitoring effort and submitting data forms to the appropriate staff.

PSOs were equipped with a range of visual monitoring equipment, including the following:

- Hooway/Bushnell 7X50 Marine Reticle Binoculars;
- FLIR Scout III 640 (640x512) Thermal Imaging Monocular;
- Canon Rebel T6 with 300mm Image Stabilized lens.

3.3. Protected Species Mitigation Measures

For regulated HRG source (impulsive: sparkers and boomers; non-impulsive: non-parametric sub-bottom profiler) operations the following protected species mitigation measures were enforced:

- **Monitoring and Pre-Start Clearance Zones:** PSO will establish and monitor clearance zones prior to the start of regulated survey operations, as follows:
 - 500m ESA-listed marine mammals (NARW, fin whale, sei whale, sperm whale and unidentified large whales);
 - 500m Sea turtles during pre-start clearance period only (i.e. no shutdown required during HRG operations)
 - 100m all other marine mammals.
- **Pre-Start Activity Observation (Pre-Start Clearance):** PSO will implement a 30-minute pre-start clearance of the specified zone, monitoring around the area prior to the startup of any regulated in water sound producing equipment for the day, after pauses of 30-minutes or more (without continuous PSO monitoring) and after periods of inclement weather or other factors that cause the relevant zone and adjacent waters to be non-observable. During this period, the zone will be monitored by one (1) PSO equipped with the appropriate visual monitoring technology. Regulated sound sources will not be activated if any protected species are observed within the clearance zone. If protected species are observed entering or within the established zone within the 30 minutes prior to ramp-up of equipment, survey activities will be delayed and may not commence until either the animal(s) has voluntarily left and been visually confirmed beyond the zone or a clearance period (15 minutes for small odontocetes & seals and 30 minutes for all other marine mammals and sea turtles) has elapsed without subsequent detection of the animal(s).
- **Ramp-up/Soft Start Procedure:** Once the PSO team has confirmed completion of the pre-start clearance, operators may begin activation of sound source equipment (when technically feasible) at half power level for 5 minutes before increasing to full survey power.
- **Exclusion zones:** PSO will establish and monitor exclusion zones prior to the start of regulated HRG operations, and throughout said operations as follows:
 - 500m NARW (and unidentified large whales);

- 200m all other nonexempt¹ marine mammal species².
- **Shutdowns:** In the event that a non-exempt protected species is sighted entering or observed within the applicable exclusion zone during active survey operations, an immediate shutdown of regulated sound source equipment will be required. Regulated HRG survey activities will not resume until the animal(s) has been confirmed to have left the relevant exclusion zone or a clearance period (15 minutes for small odontocetes & seals and 30 minutes for all other species) has elapsed without subsequent detection of the animal(s). No Shutdown is required for small delphinids belonging to the following genera of the Family Delphinidae: (*Steno*, *Delphinus*, *Lagenorhynchus*, *Stenella*, and *Tursiops*) that are voluntarily approaching the vessel, pinnipeds of the following species: gray seal (*Halichoerus grypus*), harbor seal (*Phoca vitulina*) or sea turtle species. Shutdown of acoustic sources for species for which incidental take is not authorized is required regardless of circumstance.
- **Level B Harassment³ Zone:** PSO will establish and monitor the Level B harassment zones prior to the start of regulated HRG operations, as follows:
 - 141m all marine mammals.
- **Level B Harassment Tracking:** While shutdown is not always required, tracking of species exposure to elevated sound sources is, thus protected species observations within the Level B harassment zone while the regulated survey equipment is active will be noted and reported to the regulators.
- **Vessel Strike Avoidance Separation Distances:** PSO will ensure separations distances are maintained during all vessel movements, as follows:
 - 500m ESA-listed whales;
 - 200m non-ESA listed large whales⁴;
 - 100m sea turtles;
 - 50m (as feasible) for small delphinoid cetaceans and phocids.
- **Vessel Strike Avoidance:** Vigilant watch will be maintained during transits to ensure vessel operators may reach the destination safely and without causing harm to any protected species. Vessels will maintain a 10-knot speed restriction in areas designated by NMFS for the protection of NARW from vessel strike and when mother/calf pairs, pods, or large assemblages of cetaceans are observed in close proximity. PSOs are trained to distinguish and identify marine mammals, especially in the detection of NARW. If any protected species are observed within the forward path of the vessel best efforts will be made to adjust course to reestablish the required distance or the vessel will shift into neutral and wait for the animal(s) or drift or the vessel to reestablish the relevant separation distance. If sea turtles, or

¹ Nonexempt marine mammals include all protected marine mammal species listed within the IHA and any other marine mammals that do not have takes allocated to them that come within the Exclusion Zone during active periods of HRG survey.

² 200m Exclusion Zone comes from the BOEM PDCs and BMPs

³ Level B harassment is defined by NOAA Fisheries as an act that has the “potential to disturb (but not injure) a marine mammal or marine mammal stock in the wild by disrupting behavioral patterns, including, but not limited to, migration, breathing, nursing, feeding or sheltering.

⁴ 200m Vessel Separation Distance comes from the BOEM PDCs and BMPs

manta rays are observed within the forward path of the vessel, it will slow to 4 knots until the animals is outside the forward path. For work in areas where the bottom of the vessel is within 4 feet of the sea floor, vessel speeds will not exceed 4 kts to protect both Atlantic sturgeon and sawfish.

- Vessel strike avoidance measures are waved and do not apply in cases “where compliance would create an imminent and serious threat to a person or vessel” or in instances that a vessel is restricted in its ability to maneuver and cannot physically comply with said measures.
- **Harassment, Harm, Injury and Disturbance Reporting:** PSO will immediately report instances of harassment, harm, or injury to protected species as well as instances of NARW detections or any entangled or dead protected species to the NMFS, the Coast Guard and through the WhaleAlert app (<http://www.whalealert.org/>).

4. OPERATIONAL & PSO EFFORT SUMMARY

SJW conducted one vessel-based operation in support of pre-construction HRG survey work along the planned potential export cable corridors, located in Delaware, associated with BOEM OCS-A 0482 and OCS-A 0519 Lease Area (Lease Area) during September and October 2023. A brief overview of operational activities including vessel activities, operations utilizing regulated HRG sound sources and PSO effort is included in the below subsection. A detailed timeline of all PSO effort and survey activities can be found in the Microsoft Excel file accompanying this report.

4.1. Operational Activity Summary

A single daylight operations vessel, the Shackleford, operated out of the Sunset Marina in Ocean City, Maryland. The vessel deployed and returned to the Sunset Marina in Ocean City MD daily. No other ports were utilized for the duration of this survey effort. A team of two (2) PSOs were stationed aboard the Shackleford (**Figure 1**) to implement protected species monitoring and mitigation for all HRG survey operations and to conduct vessel strike avoidance monitoring and mitigation during all vessel transits. PSOs were stationed at the fly-bridge level of the vessel while monitoring, resulting in a base height of 4.34m above water surface.



Figure 1 PSO Duty Location

A vessel transit is defined as a single trip from port to the offshore operational location, or a single trip from the offshore operational location to port. Detailed SJW vessel transit data from September and October are presented in Table 2 below. The only active SJW vessel, the Shackelford, completed 54 total transits, to and from the SJW export cable route to perform survey operations (Table 2). There were five (5) days that the teams deployed but active HRG sources were not utilized. September 10th the vessel transited, with PSOs aboard, to an area south of the inlet to calibrate the Multibeam Echo Sounding equipment only and on October 7th the vessel transited, with PSOs aboard, to an area just offshore of Ocean City, MD to calibrate the vessel's autopilot only. Finally, October 13th, 25th and 27th the vessel was offshore with PSOs aboard and monitoring but did not conduct any survey operations utilizing HRG sources. After the final transit returning to the dock on October 27th no additional survey activities occurred.

Table 2 Vessel transit details for SJW site investigation activities, September and October 2023.

Vessel Name	Vessel Type	Number of Transits	Vessel Routes
R/V Shackelford	Research Vessel	54	To/From SJW Export Cable Route and Sunset Marina in Ocean City, MD

The Shackelford conducted daylight only regulated HRG survey operations along potential SJW ERCs over 24 days: September 11-13, 17-21, and 25 and October 2-6, 9-12, 14, 17-19, 22 and 24.

Table 3 High Resolution Geophysical Equipment utilized during SJW site investigation

Sensor Group	Equipment	Model	Frequencies Used	Mitigated Source
Positioning	USBL Transponder	MiniRanger 2	19 – 34 kHz	No
Positioning	USBL Beacon	WSM6+	19 – 34 kHz	No
MBES	Port Head	Kongsberg MK II	200 – 400 kHz	No
MBES	Starboard Head	Kongsberg MK II	200 – 400 kHz	No
SSS	Primary Towfish	Edgetech 4205	400 / 900 kHz	No
SBP	Sub-bottom Profiler	Innomar SES-2000 Medium	5 – 15 kHz	No
S-UHRS	Source Unit	Applied Acoustics Duraspark 400	1.2 – 300 kHz	Yes

Figure 2 breaks down the amount of time spent offshore per vessel activity. As illustrated below, the only piece of regulated HRG survey equipment in use for this survey was the Applied Acoustics Dura-Spark. Required Ramp-Ups (*half power for 5 minutes and then proceed to full power*) of this equipment were conducted daily prior to usage and occurred for a total of 3 hours and 44 minutes. The total duration of regulated Dura-Spark activity for this survey was 105 hours and 58 minutes. There were no PSO-initiated protected species detection delays to operational start up implemented, however there was one shutdown of the regulated Dura-Spark called for by the PSO team and enacted by the vessel crew immediately. This is expanded upon in Section 5 below. No other HRG survey activities requiring PSOs occurred during this time period.

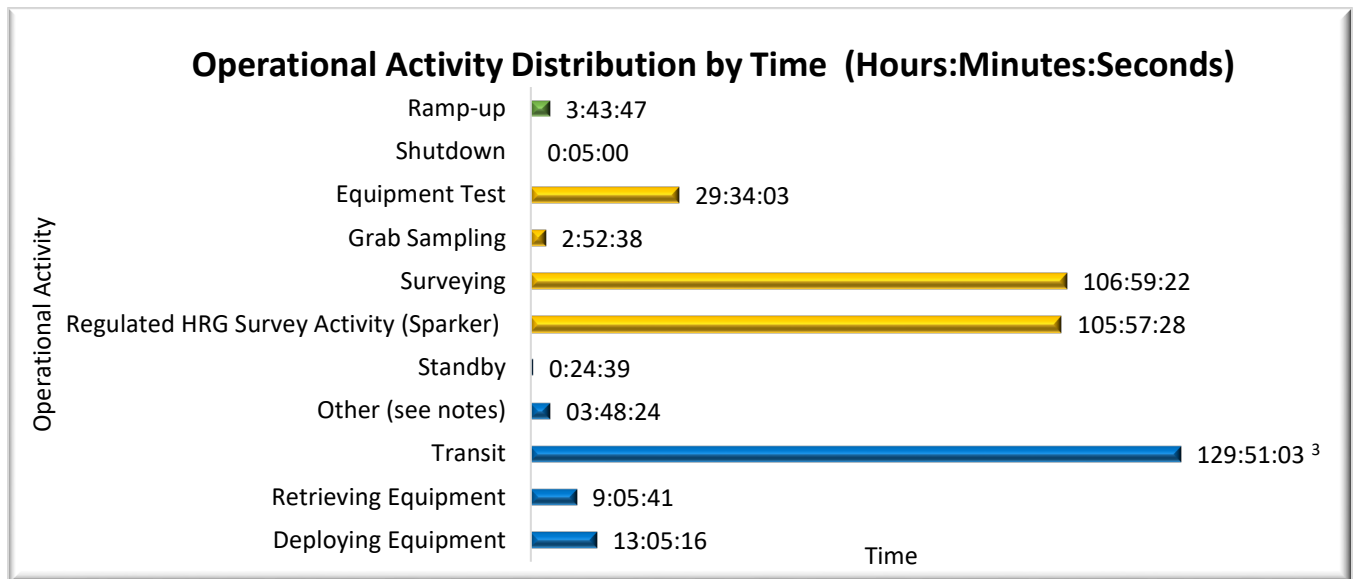


Figure 2 Operational Activity Distribution by Time (hh:mm:ss)

Note: Other = equipment calibrations & troubleshooting and videoing bottom at grab locations

4.2. Protected Species Observer Effort Summary

Figure 3 breaks down the amount of time spent offshore per monitoring activity while **Figure 4** provides a summary of PSO effort by number of PSOs on duty. Pre-start clearance monitoring occurred 105 times for a total of 11 hours and 51 minutes and was implemented prior to all activations of regulated sound source equipment. As indicated above, there was one shutdown of the Dura-Spark which is expanded upon in Section 5 below.

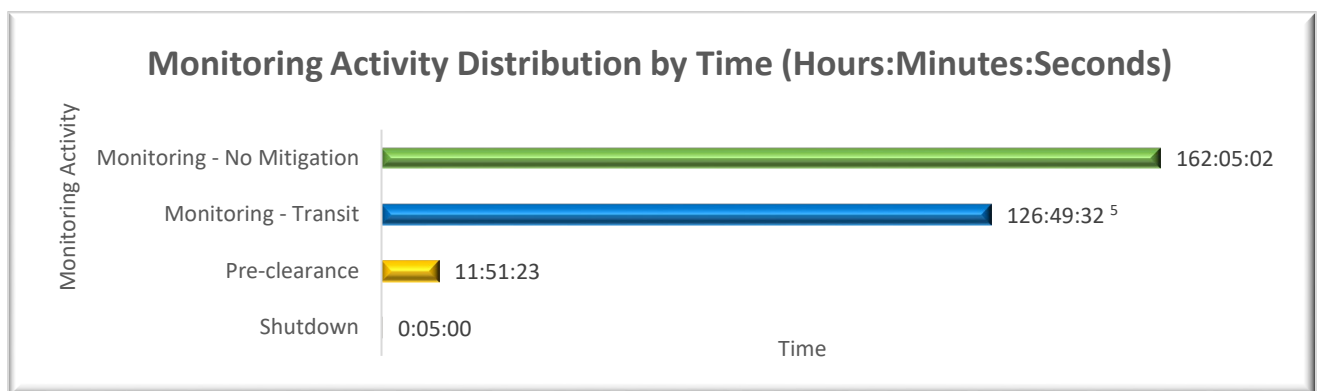


Figure 3 Monitoring Activity Distribution by Time (hh:mm:ss)

During the survey PSOs visually monitored the area around the vessel for a grand total of 300 hours and 51 minutes. Of this time, the area was monitored by two visual observers for 98 hours and 40 minutes and by one visual observer for 201 hours and 42 minutes. There were two instances of alternative monitoring technology

⁵ Transit (Vessel Activity) vs Monitoring Transit (Monitoring State): the difference between these times is due to overlapping operational activities. Upon arriving on site the PSO team initiated pre clearance monitoring (Monitoring State) when the survey area was visible. In many cases this occurred prior to the conclusion of the transit and overlapped with other vessel activities including the following: deploying equipment, retrieving equipment, equipment test (only for non-regulated sound sources) transit and surveying (only for non-regulated sound sources).

usage during this survey. Both occurred during transits in the early hours of the morning when both PSOs were on watch, one monitoring visually unassisted and one utilizing the above-mentioned thermal imaging technology. In total PSOs monitored utilizing alternative monitoring technology for 29 minutes.

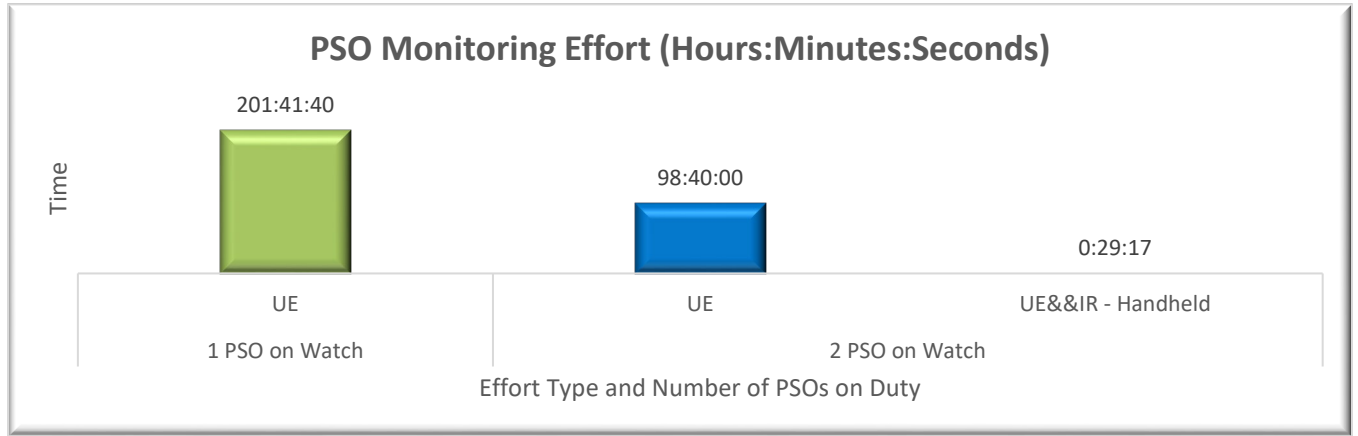


Figure 4 PSO Monitoring Effort (hh:mm:ss)

After the vessel completed its transit back to land, the PSOs were released from duty and demobilized. Refer to the timeline of survey activities presented in the EXCEL file accompanying this report for further detail regarding PSO watches and HRG survey activities conducted during this campaign.

5. PROTECTED SPECIES DETECTIONS AND MITIGATION

Illustrated in **Table 4**, SJW PSOs documented a combined total of 194 marine mammal and sea turtle sightings during this deployment, consisting of an estimated 1536 individual animals that were visually observed (Appendix A). There were no detections using alternative monitoring technology.

Table 4 Number of Detections and Individual Animals Detected

Species Group/Species	Total Number of Detections	Total Number of Individual Animals Detected
<i>Whales</i>	12	15
Humpback Whale	9	10
Unidentified Mysticete Whale	3	5
<i>Dolphins</i>	171	1510
Bottlenose Dolphin	166	1446
Unidentified Dolphin	5	64
<i>Sea Turtles</i>	11	11
Loggerhead Sea Turtle	8	8
Leatherback Sea Turtle	1	1
Kemp's Ridley Sea Turtle	1	1
Unidentified Sea Turtle	1	1
Grand Total	194	1536

The most frequently observed species detected by PSOs were bottlenose dolphins, *Tursiops truncatus*, with a total 166 detections of 1446 individual animals. Humpback (*Megaptera novaeangliae*) and unidentified (non

NARW) whales were observed nine and three times, respectively. The three (3) unidentified Mysticete whales were difficult to identify due to the combination of environmental conditions offshore and sighting distances. However, PSOs reported no NARW characteristics during multiple viewings of these animals. The remaining sightings were of leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*) and Kemp's ridley (*Lepidochelys kempii*) sea turtles, along with unidentified dolphin and sea turtle species. There were no other large whale or porpoise detections during this deployment. The majority of sightings were documented by PSOs onboard the Shackleford during transits to and from the survey area (**Figure 5**).

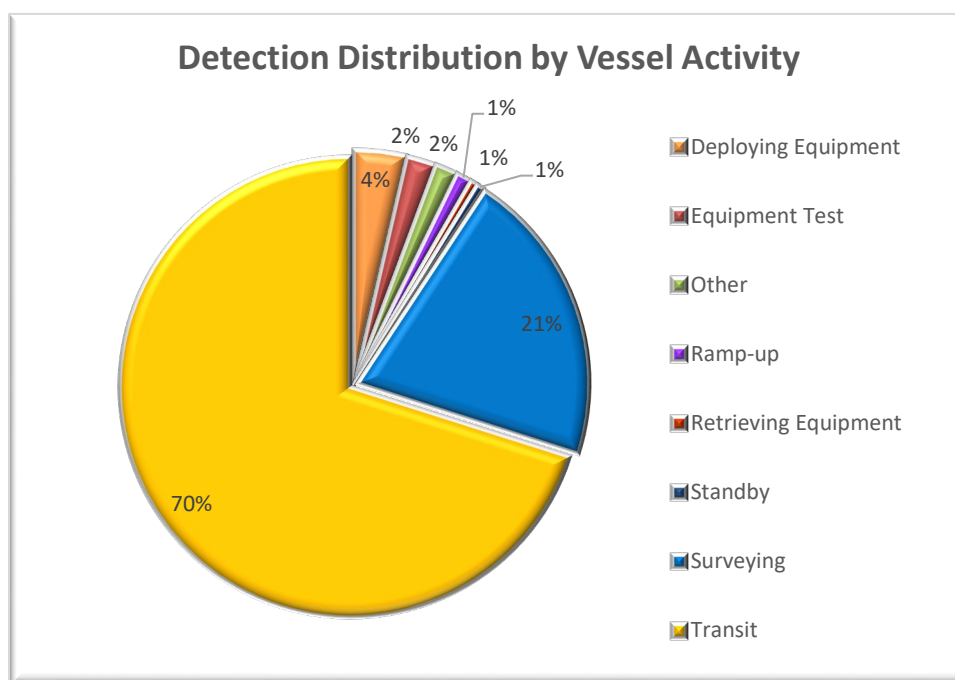


Figure 5 Detection Distribution by Vessel Activity

Fifty-eight (58) protected species detections were concurrent with active periods of HRG survey equipment, however only 36 of these coincided with regulated HRG activities. These detections consisted of humpback and unidentified whales, bottlenose and unidentified dolphins and loggerhead sea turtles, the majority of these which remained well outside the 200-meter marine mammal exclusion zone. Closest Points of Approach (CPA) ranged from 100 – 2200 meters (**Figure 6**). There was one humpback whale detection that triggered shutdown mitigation measures to be enacted (Appendix A, Detection ID v121). Two detections of bottlenose dolphins encroached within the 141 Level B Harassment Zone and could potentially be deemed as takes (Appendix A, Detection IDs v90, and v141). There were nine (9) bottlenose dolphin detections (Appendix A, Detection IDs v19, v30, v39, v41, v42, v114, v115, v134 and v152) that had CPAs (closest points of approach) of 50 meters or less but no vessel strike mitigation was required. Finally, two loggerhead sea turtle detections (Appendix A, Detection IDs v3, and v8) that did require mitigation.

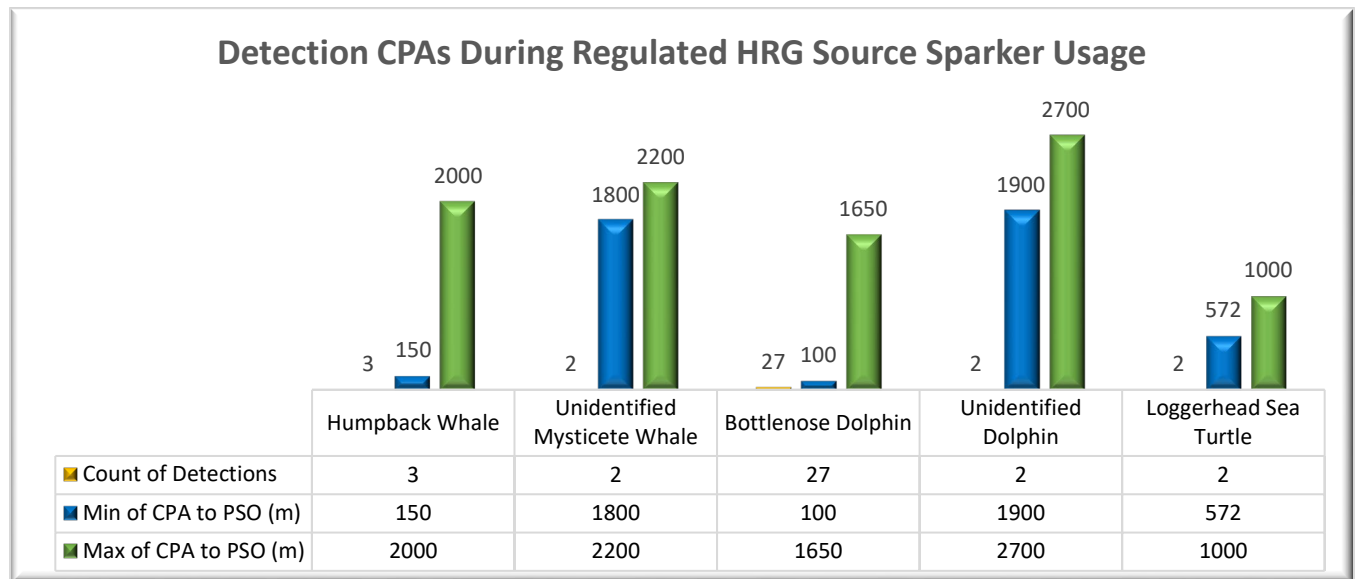


Figure 6 Detection CPAs During Regulated HRG Source Usage

October 17th brought with it the only **shutdown** for the project. A solitary (1) humpback whale (v121) was initially observed at a visually estimated 1000 meters (982 meters estimated by reticulated binoculars) directly ahead of the vessel. As the vessel approached, the animal began to move off to the port side. At 16:52 UTC the animal surfaced within the exclusion zone approximately 150 meters from the vessel and the active sound source. A shutdown of the sparker was called for by the PSO team and enacted immediately by the vessel crew. The animal was within the 200-meter exclusion zone of the active sound source for approximately 10 seconds (estimated by the Lead PSO) before the source was shutdown. The animal was not detected closer to the vessel than 150 meters. At 16:57 UTC the animal was subsequently observed at 700 meters astern of the vessel and headed away. Because the animal was confirmed to be outside the Exclusion Zone and headed away from the survey area operations were reinitiated at 16:57 UTC. Because the animal was observed exiting the exclusion zone the PSO team allowed a re-initiation of operations without the required soft start occurring. The last time this animal was observed was 16:58 UTC. No other shutdowns were required or enacted.

During this campaign, two (2) dolphin detections potentially meet the criteria to be considered **takes**, they were observed within the Level B Harassment Zone of 141 meters but are a shutdown exempt species under certain circumstances. On October 12th the offshore PSO team observed a best estimate of four bottlenose dolphins (v90) initially at 600 meters and with a Closest Point of Approach (CPA) of 125 meters. These animals were observed for a total of 46 seconds voluntarily approaching the vessel with approximately five seconds (estimated by the Lead PSO) of that being within the 141-meter Level B Harassment Zone for marine mammals. On October 18th the PSO team detected a group of 12 bottlenose dolphins (v141) that were initially observed 300 meters from the sound source. This sighting consisted of three separate groups of dolphins. One of these groups, comprised of three individual animals, voluntarily approached the vessel and was observed at a CPA of 100 meters. There were approximately 15 seconds (estimated by the Lead PSO) that this group of three was within the 141-meter Level B Harassment Zone for marine mammals.

Table 5 Number of Allotted Marine Mammal Takes vs Animals Observed within the Level-B Harassment Zone

Taxonomic group	Common name	ESA-listed?	IHA Allotted Level B Harassment Takes	Number of Marine Mammals Observed within Level-B Harassment Zone	Number of Marine Mammals Observed within Level-B Harassment Zone while Regulated Sources were Active
Cetacean (Mysticete)	North Atlantic right whale	Yes	11	0	0
	Fin whale	Yes	7	0	0
	Sei whale	Yes	1	0	0
	Minke whale	No	2	0	0
	Humpback Whale	No	4	0	1*
Cetacean (Odontocete)	Sperm whale	Yes	3	0	0
	Atlantic white-sided dolphin	No	50	0	0
	Atlantic spotted dolphin	No	15	0	0
	Common bottlenose dolphin	No	2,752	410	16
	Long-finned pilot whale	No	20	0	0
	Risso's dolphin	No	20	0	0
	Common dolphin (shortbeaked)	No	400	0	0
	Harbor porpoise	No	82	0	0
Pinniped (Phocid)	Gray seal	No	4	0	0
	Harbor seal	No	4	0	0

*This whale (v121) was observed surfacing at approximately 150 meters within the 200m Level B Zone while sound sources were active. The sound source was shut down immediately.

Vessel strike avoidance mitigations measures were required only twice during this campaign. Two solitary (1) loggerhead sea turtles (v3 and v8) were observed with CPA's of 5 and 100 meters respectively. Both observations triggered vessel strike avoidance action. For detection v3, the individual animal was observed at approximately 100 meters off the bow and a shift to neutral was called for and complied with immediately. The vessel remained in neutral until the turtle cleared the 100m strike avoidance exclusion zone and was observed behind the vessel. During detection v8, the solitary turtle was initially observed at approximately 100m off the bow and was observed swimming in the opposite direction of the vessel. An adjustment of course was called for and enacted immediately such that the 100m minimum separation distance was maintained and not encroached upon. There were nine (9) bottlenose dolphin detections (Appendix A, Detection IDs v19, v30, v39, v41, v42, v114, v115, v134 and v152) that had CPA (closest point of approach) of 50 meters or less but no vessel strike mitigation was required. In response to these instances the vessel maintained a steady course and speed. During detections v19, v30 and v152 the dolphins were initially observed off the bow (starboard or port) of the vessel and slowly transitioned abeam of the vessel such that upon their respective CPA's, these groups of animals were not within the forward path of the vessel and thus did not require vessel strike avoidance mitigation measures to be enacted. The dolphins of detection v114, were initially observed off the port side and were swiftly traveling south. Their CPA of 50 meters was abeam and well outside the forward path of the vessel, thus did not require vessel strike avoidance mitigation measures to be enacted. Finally, detections v39, v41, v42, v115 and v134 were all groups of curious dolphins that were observed actively approaching the vessel and thus did not require vessel strike avoidance mitigation measures to be enacted. No other Vessel Strike Avoidance mitigation actions were required or enacted during this deployment.

Table 6 Mitigation and Vessel Strike Avoidance Summary

Detection Identifier	Vessel Activity	Species	BEST # of Individual Animals	Initial Detection Distance (m)	CPA (m)	Mitigation Action/Status	Duration of Downtime (hh:mm:ss)	Potential Take	Vessel Strike Avoidance Action
v3	Equipment Test (>200kHz)	Loggerhead Sea Turtle	1	100	5	Engine Neutral	00:00:00	No	Yes
v8	Equipment Test (>200kHz)	Loggerhead Sea Turtle	1	100	100	Alter Course	00:00:00	No	Yes
v19	Surveying	Bottlenose Dolphin	6	150	50	Not Required	00:00:00	No	Not Required
v30	Transit	Bottlenose Dolphin	8	500	50	Not Required	00:00:00	No	Not Required
v39	Transit	Bottlenose Dolphin	15	75	25	Not Required	00:00:00	No	Not Required
v41	Transit	Bottlenose Dolphin	7	792	25	Not Required	00:00:00	No	Not Required
v42	Transit	Bottlenose Dolphin	7	300	25	Not Required	00:00:00	No	Not Required
v90	Surveying (<200kHz)	Bottlenose Dolphin	4	600	125	Level B Harassment Zone Entry	00:00:00	Yes	Not Required
v114	Transit	Bottlenose Dolphin	4	300	50	Not Required	00:00:00	No	Not Required
v115	Transit	Bottlenose Dolphin	2	100	50	Not Required	00:00:00	No	Not Required
v121	Surveying (<200kHz)	Humpback Whale	1	1000	150	Shutdown	00:00:10	No	Not Required
V134	Transit	Bottlenose Dolphin	8	400	50	Not Required	00:00:00	No	Not Required
v141	Surveying (<200kHz)	Bottlenose Dolphin	3	300	100	Level B Harassment Zone Entry	00:00:00	Yes	Not Required

No injured or dead protected species were observed for the duration of this survey effort. Please refer to the attached PSO data collected during this deployment. These data provide additional project, operational, and detection information beyond what is summarized in the body of the report.

6. SUMMARY OF WEATHER & ENVIRONMENTAL CONDITIONS

Part of the data collection associated with PSO operations includes various weather and environmental conditions including cloud cover, wind speed, wind direction, precipitation, sun glare and visibility during observations. These factors can affect the PSOs ability to observe the required zones effectively, ultimately delaying operations. **Figures 7-11** illustrate the distribution of weather variables during PSO monitoring onboard the Shackelford during the investigation.

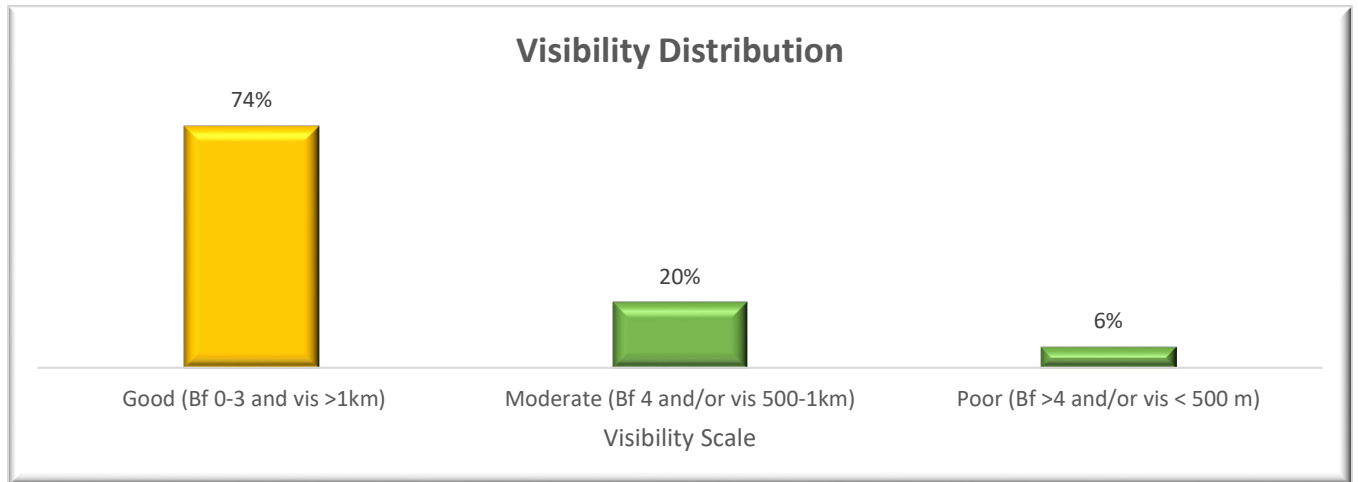


Figure 7 Visibility Distribution (Good = >1,000m, Moderate= 1,000 – 500m, Poor= <500m)
 (Bf = Beaufort, vis=visibility)

Throughout this campaign PSOs were able to view the entire shutdown and monitoring zones under mostly good, somewhat moderate and few instances of poor visibility conditions as illustrated above in **Figure 7**. Moderate and poor visibility are attributed to the atmospheric conditions and moderate glare that occasionally hindered visibility. For the majority of operations there was no precipitation and skies were clear (62%), apart from partly cloudy (19%) and overcast (14%) periods there was very little precipitation (combined 4%) as represented by **Figure 8** below.

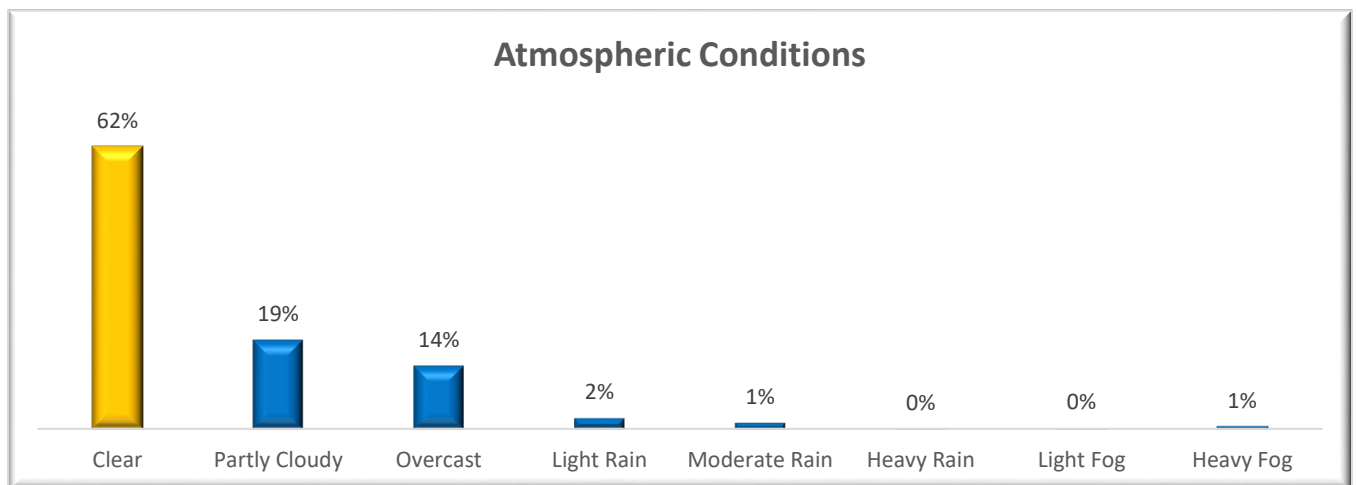


Figure 8 Precipitation Distribution

Figure 9 illustrates glare severity encountered throughout survey operations. No glare and slight glare were experienced for the majority of the survey (25% and 30% respectively). Moderate glare was present for 41% of the survey and extreme glare was only present for a minimal amount for time (4%) resulting in overall moderate visibility conditions for protected species monitoring.

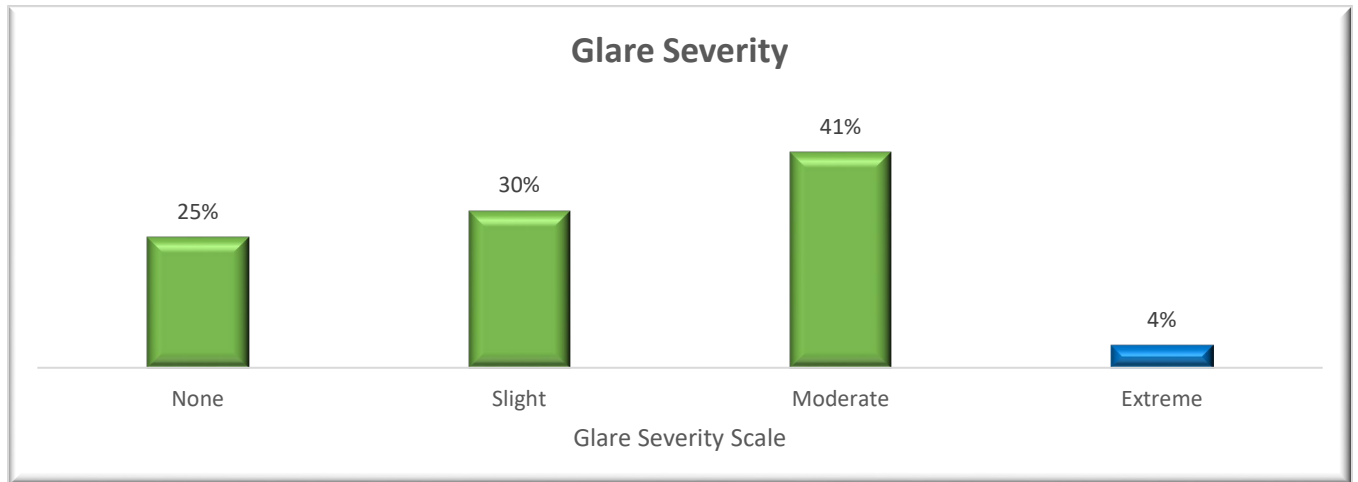


Figure 9 Glare Severity Distribution

None= no glare, Slight = faint, but easily monitored, Moderate = substantial, somewhat difficult to monitor Extreme = any amount of glare too difficult to monitor

Beaufort sea state recorded during visual monitoring ranged from level one to level four over the course of the monitoring period (**Figure 10**). Only 3% of visual observations were undertaken during elevated weather conditions, instances when the Beaufort state was level four or above.

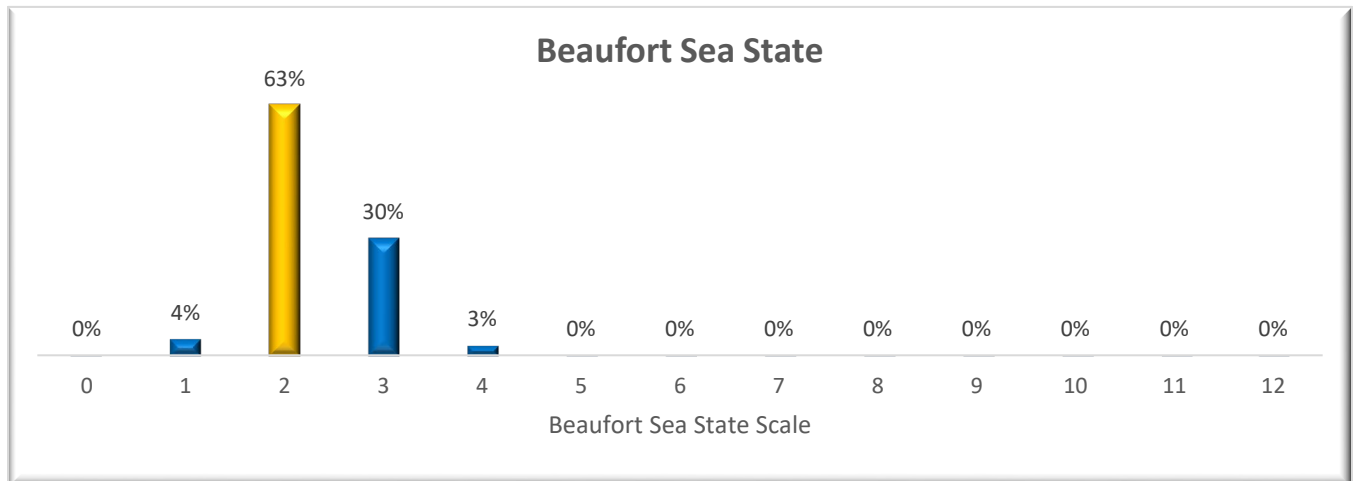


Figure 10 Beaufort Sea State Distribution

As illustrated in **Figure 11**, cloud cover varied widely over the course of this deployment. This resulted in the elevated glare conditions that created moderately less than ideal monitoring conditions occasionally.

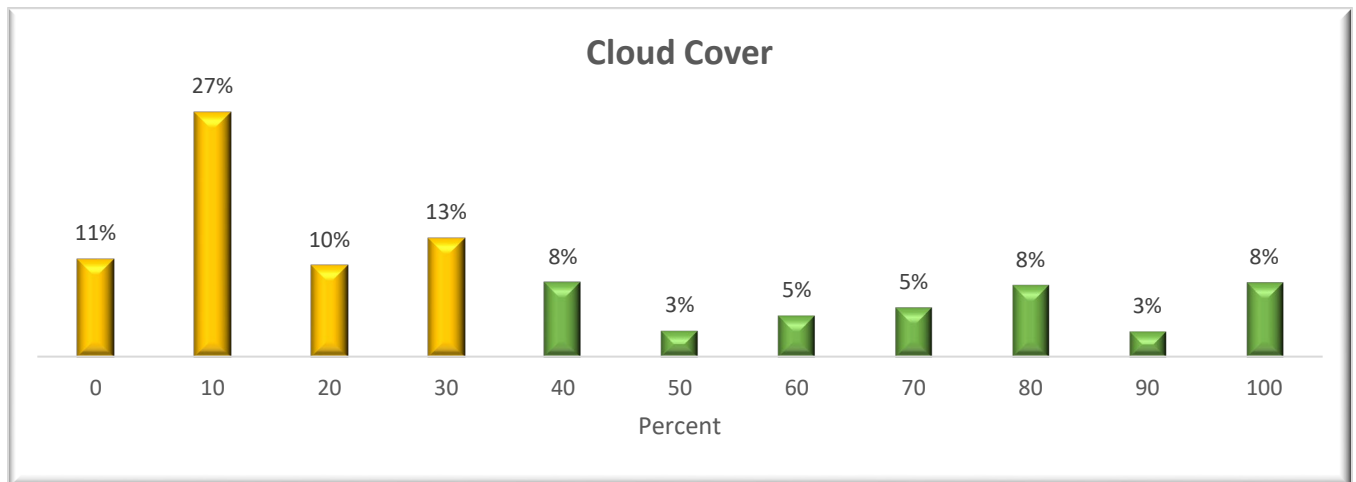


Figure 11 Cloud Cover Distribution

The overall good visibility, minimal of precipitation combined with lower sea state amounted to generally favorable conditions for PSO monitoring. As a result, the PSO Team is confident that they were able to monitor the exclusion zone effectively for protected species throughout the duration of the survey.

7. ASSESSMENT OF MONITORING METHODS

The daylight only operations were monitored by two (2) PSOs who could effectively observe the clearance and exclusion zones from the fly bridge level of the survey vessel. As indicated above in Section 3, to remain consistent with the permit stipulations the PSOs began monitoring periods each morning when the vessel left the harbor to begin transiting to the day's survey area and continued rotational watches until arriving back at the harbor each evening. During this time visual monitoring was completed to comply with vessel strike avoidance measures, pre-start clearances and survey watch requirements. There was never an instance in which one PSO monitored for longer than the allotted four (4) hours without at least a two (2) hour break in between.

During daylight hours the PSOs conducted observations encompassing 360° around the vessel. Based on needs of the operations team to access equipment on board, the PSOs adjusted their monitoring locations on the vessel to visualize most effectively and safely the relative exclusion zone immediately surrounding the survey equipment. This allowed for the PSOs to appropriately visualize and clear the exclusion zone and allow for continuous operations meeting the standards outlined in the regulatory documents. The monitoring and mitigation measures required proved to be an effective means to monitor for marine protected species, many of which were encountered during operations.

8. ACKNOWLEDGEMENTS

We would like to extend our sincere gratitude to the operations crew and team members at Geodynamics for their assistance and hospitality for the duration of these works as well as the AIS PSOs for their continuous effort and dedication to accurate and consistent data collection.

REFERENCES

- NOAA Fisheries. (2023). *Section 7: Types of Endangered Species Act Consultations in the Greater Atlantic Region*. Retrieved from NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION | U.S. DEPARTMENT OF COMMERCE: <https://www.fisheries.noaa.gov/insight/section-7-types-endangered-species-act-consultations-greater-atlantic-region>
- US Dept of the Interior, BOEM, Office of Renewable Energy Programs Atlantic OCS Region. (2021, November 22). Project Design Criteria and Best Management Practices for Protected Species Associated with Offshore Wind Data Collection.
- US Dept. of Commerce, NOAA, NMFS. (2023, May 11). Incidental Harassment Authorization, Ørsted Wind Power North America, LLC, Site Characterization Surveys. US Federal Register.

Appendix A.

SJW 2 Geophysical Survey Protected Species Observations

Detection ID	Species	Detection Date and Time (UTC)	No. of Animals	Closest Point of Approach (CPA)	Vessel Activity ¹	Mitigation Measures
v1	Bottlenose Dolphin	2023-09-10T13:31:21.4	4	150	Transit	None
v2	Bottlenose Dolphin	2023-09-10T18:12:13.4	20	100	Transit	None
v3	Loggerhead Sea Turtle	2023-09-11T16:34:06.0	1	5	Equipment Test	Engine Neutral
v4	Bottlenose Dolphin	2023-09-12T11:29:16.4	8	150	Transit	None
v5	Leatherback Sea Turtle	2023-09-12T11:34:54.8	1	110	Transit	None
v6	Unidentified Dolphin	2023-09-12T12:30:55.0	6	2000	Transit	None
v7	Unidentified Dolphin	2023-09-13T12:54:05.5	10	500	Transit	None
v8	Loggerhead Sea Turtle	2023-09-13T16:32:28.8	1	100	Equipment Test	Alter Course
v9	Kemp's Ridley Sea Turtle	2023-09-13T20:14:50.7	1	75	Transit	None
v10	Unidentified Sea Turtle	2023-09-17T11:38:52.7	1	100	Transit	None
v11	Bottlenose Dolphin	2023-09-17T13:28:57.3	15	150	Transit	None
v12	Unidentified Dolphin	2023-09-18T21:33:36.8	6	150	Transit	None
v13	Loggerhead Sea Turtle	2023-09-19T13:02:03.1	1	150	Transit	None
v14	Bottlenose Dolphin	2023-09-19T14:08:07.4	12	200	Equipment Test	None
v15	Loggerhead Sea Turtle	2023-09-19T14:58:50.1	1	200	Equipment Test	None
v16	Bottlenose Dolphin	2023-09-19T15:41:53.2	12	1200	Deploying Equipment	None
v17	Bottlenose Dolphin	2023-09-19T21:04:36.0	8	75	Transit	None
v18	Bottlenose Dolphin	2023-09-20T16:04:33.3	3	600	Surveying	None
v19	Bottlenose Dolphin	2023-09-20T16:58:44.9	6	50	Surveying	None
v20	Bottlenose Dolphin	2023-09-20T18:56:58.5	4	200	Surveying	None
v21	Bottlenose Dolphin	2023-09-21T11:03:33.7	5	600	Transit	None
v22	Bottlenose Dolphin	2023-09-21T11:24:56.1	3	700	Transit	None
v23	Bottlenose Dolphin	2023-09-21T11:35:39.0	3	600	Transit	None
v24	Unidentified Dolphin	2023-09-21T19:29:23.7	30	2700	Surveying	None
v25	Bottlenose Dolphin	2023-09-21T21:24:41.6	5	75	Transit	None

A.I.S. Inc. Protected Species Observer – Orsted Final Report 2023
Incidental Harassment Authorization (IHA; 88 fr 30278) effective May 10, 2023 – May 9, 2024
BOEM PDCs and BMPs for Protected Species Associated with Offshore Wind Data Collection (November 22, 2021)

Detection ID	Species	Detection Date and Time (UTC)	No. of Animals	Closest Point of Approach (CPA)	Vessel Activity ¹	Mitigation Measures
v26	Bottlenose Dolphin	2023-09-25T12:37:08.4	1	150	Transit	None
v27	Bottlenose Dolphin	2023-09-25T14:37:43.7	6	1000	Transit	None
v28	Bottlenose Dolphin	2023-09-25T15:58:57.9	3	100	Surveying	None
v29	Bottlenose Dolphin	2023-09-25T18:07:36.0	2	700	Ramp-up	None
v30	Bottlenose Dolphin	2023-09-25T21:00:35.0	8	50	Transit	None
v31	Bottlenose Dolphin	2023-10-02T12:34:53.2	5	100	Transit	None
v32	Bottlenose Dolphin	2023-10-02T13:40:56.8	5	250	Transit	None
v33	Bottlenose Dolphin	2023-10-04T11:58:04.2	9	500	Transit	None
v34	Bottlenose Dolphin	2023-10-05T11:58:06.6	18	900	Transit	None
v35	Loggerhead Sea Turtle	2023-10-05T12:31:16.1	1	180	Transit	None
v36	Loggerhead Sea Turtle	2023-10-05T13:01:55.0	1	150	Transit	None
v37	Bottlenose Dolphin	2023-10-05T21:03:21.5	3	1100	Transit	None
v38	Bottlenose Dolphin	2023-10-05T21:52:24.6	6	600	Transit	None
v39	Bottlenose Dolphin	2023-10-06T21:44:32.7	15	25	Transit	None
v40	Bottlenose Dolphin	2023-10-06T21:52:58.6	8	175	Transit	None
v41	Bottlenose Dolphin	2023-10-06T21:58:26.2	7	25	Transit	None
v42	Bottlenose Dolphin	2023-10-06T22:05:32.5	7	25	Transit	None
v43	Bottlenose Dolphin	2023-10-09T11:01:17.7	14	650	Transit	None
v44	Bottlenose Dolphin	2023-10-09T11:22:03.9	8	100	Transit	None
v45	Bottlenose Dolphin	2023-10-09T11:27:40.0	8	200	Transit	None
v46	Bottlenose Dolphin	2023-10-09T12:08:25.8	4	200	Transit	None
v47	Bottlenose Dolphin	2023-10-09T12:28:15.3	7	100	Transit	None
v48	Bottlenose Dolphin	2023-10-09T21:07:11.3	8	300	Transit	None
v49	Bottlenose Dolphin	2023-10-10T11:01:39.6	4	100	Transit	None
v50	Bottlenose Dolphin	2023-10-10T11:11:57.5	3	75	Transit	None

Detection ID	Species	Detection Date and Time (UTC)	No. of Animals	Closest Point of Approach (CPA)	Vessel Activity ¹	Mitigation Measures
v51	Bottlenose Dolphin	2023-10-10T11:35:56.2	3	75	Transit	None
v52	Bottlenose Dolphin	2023-10-10T12:10:07.0	6	75	Transit	None
v53	Bottlenose Dolphin	2023-10-10T12:27:44.0	20	150	Transit	None
v54	Bottlenose Dolphin	2023-10-10T13:03:20.4	20	150	Surveying	None
v55	Bottlenose Dolphin	2023-10-10T13:36:05.5	20	250	Deploying Equipment	None
v56	Bottlenose Dolphin	2023-10-10T14:20:55.4	5	300	Surveying	None
v57	Bottlenose Dolphin	2023-10-10T14:26:12.6	12	1100	Surveying	None
v58	Bottlenose Dolphin	2023-10-10T15:05:13.9	4	400	Surveying	None
v59	Bottlenose Dolphin	2023-10-10T15:12:30.0	2	300	Surveying	None
v60	Bottlenose Dolphin	2023-10-10T20:26:54.8	6	400	Transit	None
v61	Bottlenose Dolphin	2023-10-10T20:35:13.2	7	200	Transit	None
v62	Bottlenose Dolphin	2023-10-10T20:41:18.3	7	300	Transit	None
v63	Bottlenose Dolphin	2023-10-10T20:50:12.5	5	70	Transit	None
v64	Bottlenose Dolphin	2023-10-10T21:08:40.8	8	75	Transit	None
v65	Bottlenose Dolphin	2023-10-10T21:56:37.5	3	200	Transit	None
v65	Bottlenose Dolphin	2023-10-11T11:02:46.3	4	300	Transit	None
v66	Bottlenose Dolphin	2023-10-11T11:10:11.0	12	300	Transit	None
v67	Bottlenose Dolphin	2023-10-11T11:43:55.0	10	500	Transit	None
v68	Bottlenose Dolphin	2023-10-11T12:18:50.6	6	900	Transit	None
v69	Bottlenose Dolphin	2023-10-11T13:00:25.8	4	200	Deploying Equipment	None
v70	Bottlenose Dolphin	2023-10-11T13:23:24.9	7	225	Surveying	None
v71	Unidentified Dolphin	2023-10-11T14:10:24.7	12	1900	Surveying	None
v72	Bottlenose Dolphin	2023-10-11T14:23:11.2	5	850	Surveying	None
v73	Bottlenose Dolphin	2023-10-11T15:05:35.3	3	980	Surveying	None
v74	Bottlenose Dolphin	2023-10-11T15:14:30.6	2	950	Surveying	None

Detection ID	Species	Detection Date and Time (UTC)	No. of Animals	Closest Point of Approach (CPA)	Vessel Activity ¹	Mitigation Measures
v75	Bottlenose Dolphin	2023-10-11T21:04:38.6	4	100	Transit	None
v76	Bottlenose Dolphin	2023-10-11T21:09:49.4	15	100	Transit	None
v77	Bottlenose Dolphin	2023-10-11T21:15:33.5	4	200	Transit	None
v78	Bottlenose Dolphin	2023-10-11T21:19:44.1	18	300	Transit	None
v79	Bottlenose Dolphin	2023-10-12T10:49:52.4	5	100	Transit	None
v80	Bottlenose Dolphin	2023-10-12T10:54:00.9	4	900	Transit	None
v81	Bottlenose Dolphin	2023-10-12T11:20:51.8	9	175	Transit	None
v82	Bottlenose Dolphin	2023-10-12T11:37:03.9	60	100	Transit	None
v83	Bottlenose Dolphin	2023-10-12T11:52:08.0	22	200	Transit	None
v84	Bottlenose Dolphin	2023-10-12T12:01:39.6	5	1000	Transit	None
v85	Bottlenose Dolphin	2023-10-12T12:08:46.7	10	150	Transit	None
v86	Bottlenose Dolphin	2023-10-12T14:53:18.2	3	250	Surveying	None
v87	Bottlenose Dolphin	2023-10-12T15:12:11.4	2	150	Surveying	None
v88	Bottlenose Dolphin	2023-10-12T15:19:07.6	8	600	Surveying	None
v89	Bottlenose Dolphin	2023-10-12T16:38:39.3	4	300	Surveying	None
v90	Bottlenose Dolphin	2023-10-12T17:03:33.2	4	125	Surveying	None
v91	Bottlenose Dolphin	2023-10-12T18:13:31.7	8	200	Surveying	None
v92	Bottlenose Dolphin	2023-10-12T20:22:50.0	8	1500	Transit	None
v93	Bottlenose Dolphin	2023-10-12T20:39:27.3	5	200	Transit	None
v94	Bottlenose Dolphin	2023-10-12T20:43:55.8	10	500	Transit	None
v95	Bottlenose Dolphin	2023-10-12T20:52:59.3	22	200	Transit	None
v96	Bottlenose Dolphin	2023-10-12T20:59:33.5	22	200	Transit	None
v97	Bottlenose Dolphin	2023-10-12T21:04:04.0	18	150	Transit	None
v98	Bottlenose Dolphin	2023-10-13T11:22:26.1	2	75	Transit	None
v99	Bottlenose Dolphin	2023-10-13T13:37:34.4	6	175	Transit	None

Detection ID	Species	Detection Date and Time (UTC)	No. of Animals	Closest Point of Approach (CPA)	Vessel Activity ¹	Mitigation Measures
v100	Bottlenose Dolphin	2023-10-13T13:50:04.9	1	300	Transit	None
v101	Bottlenose Dolphin	2023-10-13T14:02:26.5	2	200	Transit	None
v102	Bottlenose Dolphin	2023-10-13T14:06:04.8	4	300	Transit	None
v103	Bottlenose Dolphin	2023-10-14T11:00:11.4	4	300	Transit	None
v104	Bottlenose Dolphin	2023-10-14T11:17:39.4	12	100	Transit	None
v105	Bottlenose Dolphin	2023-10-14T11:31:19.9	5	200	Transit	None
v106	Bottlenose Dolphin	2023-10-14T12:22:31.3	4	200	Transit	None
v107	Bottlenose Dolphin	2023-10-14T13:03:56.0	4	350	Ramp-up	None
v108	Bottlenose Dolphin	2023-10-14T13:58:46.6	6	350	Retrieving Equipment	None
v109	Bottlenose Dolphin	2023-10-14T14:22:54.7	6	700	Deploying Equipment	None
v110	Bottlenose Dolphin	2023-10-14T20:18:59.5	28	100	Transit	None
v111	Bottlenose Dolphin	2023-10-14T20:31:07.4	5	300	Transit	None
v112	Bottlenose Dolphin	2023-10-14T20:36:48.0	15	600	Transit	None
v113	Bottlenose Dolphin	2023-10-14T20:44:49.0	5	400	Transit	None
v114	Bottlenose Dolphin	2023-10-14T20:59:25.0	4	50	Transit	None
v115	Bottlenose Dolphin	2023-10-14T21:14:04.8	2	50	Transit	None
v116	Bottlenose Dolphin	2023-10-17T11:29:51.1	12	250	Transit	None
v117	Bottlenose Dolphin	2023-10-17T11:54:35.7	8	609	Transit	None
v118	Unidentified Mysticete Whale	2023-10-17T13:32:54.6	2	1800	Deploying Equipment	None
v119	Unidentified Mysticete Whale	2023-10-17T15:04:02.6	2	2200	Surveying	None
v120	Loggerhead Sea Turtle	2023-10-17T15:53:40.2	1	1000	Surveying	None
v121	Humpback Whale	2023-10-17T16:46:10.9	1	150	Surveying	Shutdown
v122	Humpback Whale	2023-10-17T17:23:09.8	1	600	Surveying	None
v123	Humpback Whale	2023-10-17T19:48:44.5	1	400	Transit	None

Detection ID	Species	Detection Date and Time (UTC)	No. of Animals	Closest Point of Approach (CPA)	Vessel Activity ¹	Mitigation Measures
v124	Bottlenose Dolphin	2023-10-17T20:35:01.1	14	200	Transit	None
v125	Bottlenose Dolphin	2023-10-17T20:53:05.9	4	300	Transit	None
v126	Bottlenose Dolphin	2023-10-17T21:13:56.6	5	500	Transit	None
v127	Bottlenose Dolphin	2023-10-17T21:28:09.3	8	600	Transit	None
v128	Bottlenose Dolphin	2023-10-17T21:46:09.8	17	300	Transit	None
v129	Bottlenose Dolphin	2023-10-18T11:14:30.3	4	200	Transit	None
v130	Bottlenose Dolphin	2023-10-18T11:21:15.2	10	200	Transit	None
v131	Bottlenose Dolphin	2023-10-18T11:42:15.5	15	200	Transit	None
v132	Bottlenose Dolphin	2023-10-18T11:54:38.2	10	500	Transit	None
v133	Bottlenose Dolphin	2023-10-18T12:06:02.6	7	100	Transit	None
v134	Bottlenose Dolphin	2023-10-18T12:23:32.5	10	50	Transit	None
v135	Bottlenose Dolphin	2023-10-18T12:45:52.0	30	100	Deploying Equipment	None
v136	Bottlenose Dolphin	2023-10-18T13:19:31.0	30	100	Surveying	None
v137	Bottlenose Dolphin	2023-10-18T14:00:21.3	22	400	Surveying	None
v138	Bottlenose Dolphin	2023-10-18T15:00:38.4	4	500	Surveying	None
v139	Bottlenose Dolphin	2023-10-18T15:16:36.3	6	600	Surveying	None
v140	Bottlenose Dolphin	2023-10-18T15:57:15.7	16	1000	Surveying	None
v141	Bottlenose Dolphin	2023-10-18T16:07:21.4	12	100	Surveying	None
v142	Humpback Whale	2023-10-18T21:05:14.0	1	1000	Transit	None
v143	Bottlenose Dolphin	2023-10-18T21:24:58.9	21	500	Transit	None
v144	Bottlenose Dolphin	2023-10-18T21:36:54.6	22	500	Transit	None
v145	Bottlenose Dolphin	2023-10-18T21:47:33.8	22	100	Transit	None
v146	Bottlenose Dolphin	2023-10-19T11:17:45.8	12	900	Transit	None
v147	Bottlenose Dolphin	2023-10-19T11:28:34.7	7	1100	Transit	None
v148	Humpback Whale	2023-10-19T11:30:31.4	1	1700	Transit	None

A.I.S. Inc. Protected Species Observer – Orsted Final Report 2023
Incidental Harassment Authorization (IHA; 88 fr 30278) effective May 10, 2023 – May 9, 2024
BOEM PDCs and BMPs for Protected Species Associated with Offshore Wind Data Collection (November 22, 2021)

Detection ID	Species	Detection Date and Time (UTC)	No. of Animals	Closest Point of Approach (CPA)	Vessel Activity ¹	Mitigation Measures
v149	Loggerhead Sea Turtle	2023-10-19T14:43:50.5	1	572	Surveying	None
v150	Bottlenose Dolphin	2023-10-19T19:39:03.4	4	200	Transit	None
v151	Humpback Whale	2023-10-19T20:12:04.3	1	700	Transit	None
v152	Bottlenose Dolphin	2023-10-19T21:02:28.1	8	50	Transit	None
v153	Bottlenose Dolphin	2023-10-22T10:46:36.7	8	250	Transit	None
v154	Bottlenose Dolphin	2023-10-22T10:57:11.7	3	300	Transit	None
v155	Bottlenose Dolphin	2023-10-22T11:28:32.9	10	100	Transit	None
v156	Bottlenose Dolphin	2023-10-22T11:48:04.1	3	400	Transit	None
v157	Bottlenose Dolphin	2023-10-22T12:12:14.4	10	200	Transit	None
v158	Bottlenose Dolphin	2023-10-22T15:18:25.9	1	400	Surveying	None
v159	Unidentified Mysticete Whale	2023-10-22T16:22:02.0	1	1800	Surveying	None
v160	Bottlenose Dolphin	2023-10-22T17:32:04.7	2	500	Transit	None
v161	Bottlenose Dolphin	2023-10-22T17:40:11.0	17	150	Transit	None
v162	Bottlenose Dolphin	2023-10-22T17:52:01.6	22	300	Transit	None
v163	Bottlenose Dolphin	2023-10-22T18:02:28.9	20	200	Transit	None
v164	Bottlenose Dolphin	2023-10-22T18:10:16.2	8	200	Transit	None
v165	Bottlenose Dolphin	2023-10-24T11:22:28.1	5	100	Transit	None
v166	Bottlenose Dolphin	2023-10-24T12:02:37.8	14	200	Transit	None
v167	Bottlenose Dolphin	2023-10-24T12:24:33.1	8	200	Transit	None
v168	Bottlenose Dolphin	2023-10-24T12:40:53.8	6	750	Deploying Equipment	None
v169	Bottlenose Dolphin	2023-10-24T13:42:50.1	6	1008	Surveying	None
v170	Bottlenose Dolphin	2023-10-24T13:51:38.0	8	250	Surveying	None
v171	Bottlenose Dolphin	2023-10-24T14:19:11.5	8	1650	Surveying	None
v172	Humpback Whale	2023-10-24T18:34:55.0	1	2000	Surveying	None
v173	Bottlenose Dolphin	2023-10-24T18:39:09.0	6	800	Surveying	None

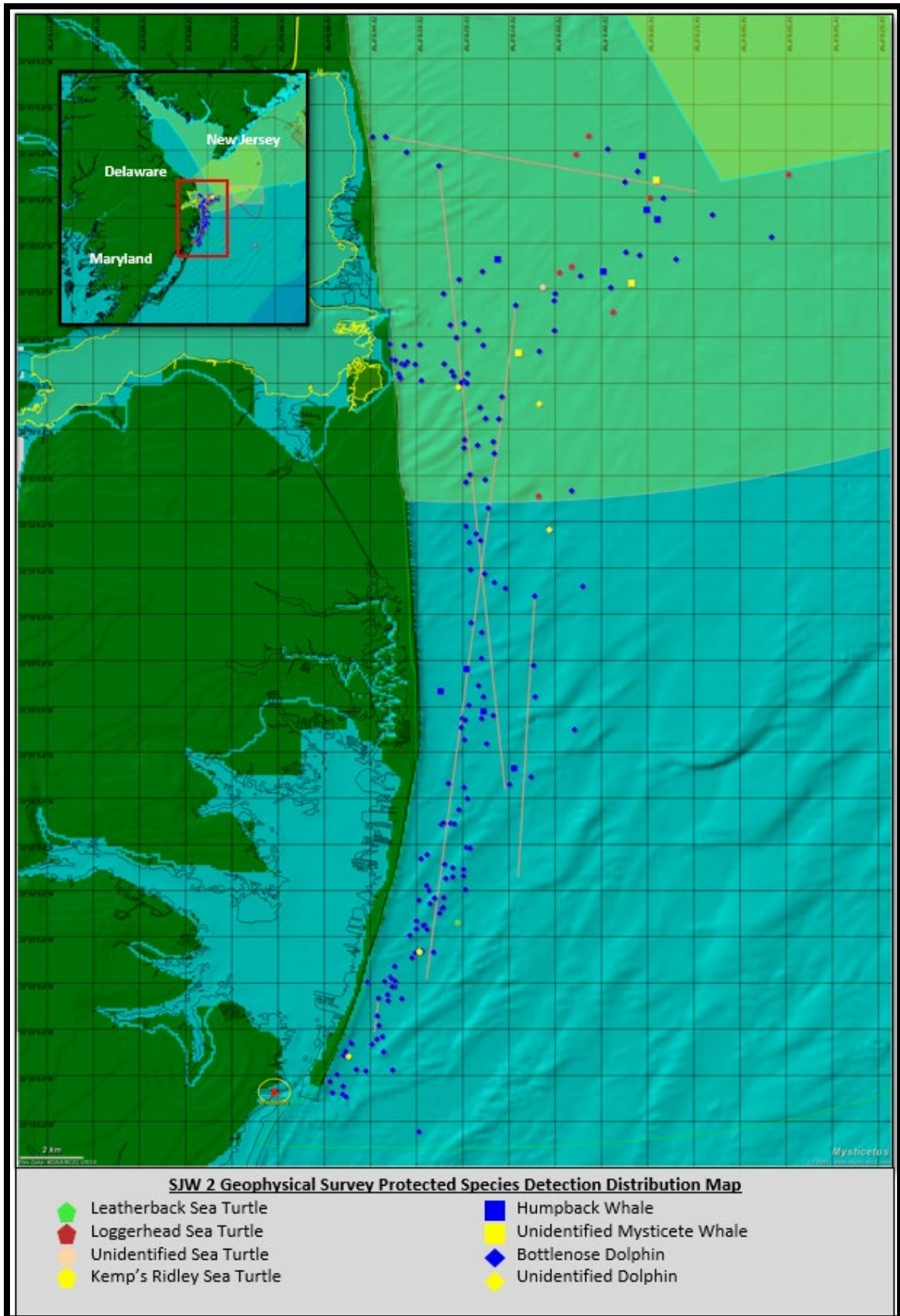
Detection ID	Species	Detection Date and Time (UTC)	No. of Animals	Closest Point of Approach (CPA)	Vessel Activity ¹	Mitigation Measures
v174	Bottlenose Dolphin	2023-10-24T20:42:40.2	6	400	Transit	None
v175	Bottlenose Dolphin	2023-10-24T21:01:23.9	12	500	Transit	None
v176	Bottlenose Dolphin	2023-10-24T21:35:24.9	4	500	Transit	None
v177	Bottlenose Dolphin	2023-10-25T10:48:11.8	6	200	Transit	None
v178	Bottlenose Dolphin	2023-10-25T11:17:26.5	5	300	Transit	None
v179	Bottlenose Dolphin	2023-10-25T12:11:55.2	6	150	Transit	None
v180	Bottlenose Dolphin	2023-10-25T14:42:16.8	5	300	Standby	None
v181	Bottlenose Dolphin	2023-10-25T18:08:16.7	4	100	Transit	None
v182	Humpback Whale	2023-10-25T18:39:50.4	2	2200	Surveying	None
v183	Bottlenose Dolphin	2023-10-25T20:16:02.2	10	400	Transit	None
v184	Bottlenose Dolphin	2023-10-25T20:35:35.8	9	300	Transit	None
v185	Bottlenose Dolphin	2023-10-27T11:43:14.0	2	500	Transit	None
v186	Bottlenose Dolphin	2023-10-27T12:25:48.2	4	150	Transit	None
v187	Bottlenose Dolphin	2023-10-27T16:50:10.4	10	250	Other (see notes)	None
v188	Bottlenose Dolphin	2023-10-27T17:50:32.2	4	500	Other (see notes)	None
v189	Bottlenose Dolphin	2023-10-27T18:08:14.0	5	400	Other (see notes)	None
v190	Humpback Whale	2023-10-27T21:08:48.6	1	500	Transit	None
v191	Bottlenose Dolphin	2023-10-27T21:32:10.9	6	1000	Transit	None
v192	Bottlenose Dolphin	2023-10-27T21:51:09.9	8	100	Transit	None
v193	Bottlenose Dolphin	2023-10-27T22:06:53.1	2	150	Transit	None

Note: Additional sighting details are included in the PSO data attached to this report.

¹Vessel Activity is defined as the activity of the vessel at the time of initial detection.

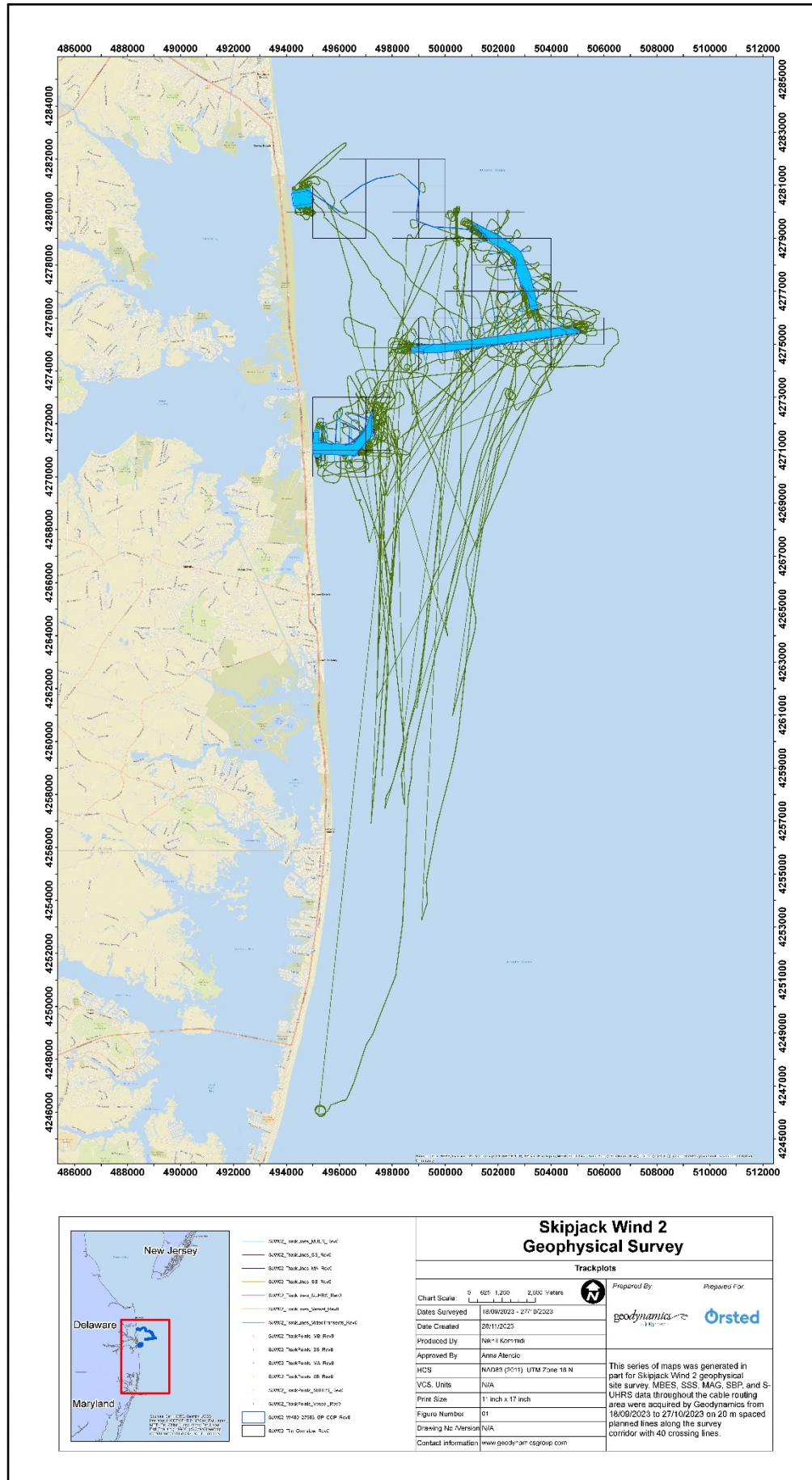
Appendix B.

SJW 2 Geophysical Survey Protected Species Detection Distribution Map



Appendix C.

SJW 2 Geophysical Survey Track Plot Map



Appendix D.

Appendix D. SJW 2 Geophysical Survey IHA Authorized Incidental Take by Level B Harassment Table from Project IHA

Authorized Incidental Take by Level B Harassment

Taxonomic group	Common name	Scientific name	Stock	ESA-listed?	Marine mammal category as it applies to mitigation requirements in the IHA	Level B harassment takes
Cetacean (Mysticete)	North Atlantic right whale	<i>Eubalaena glacialis</i>	Western Atlantic Stock	Yes	North Atlantic right whale	11
	Fin whale	<i>Balaenoptera physalus</i>	Western North Atlantic Stock	Yes	Large whale	7
	Sei whale	<i>Balaenoptera borealis</i>	Nova Scotia Stock	Yes	Large whale	1
	Minke whale	<i>Balaenoptera acutorostrata</i>	Canadian East Coastal Stock	No	Large whale	2
	Humpback whale	<i>Megaptera novaeangliae</i>	West Indies DPS	No	Large whale	4
Cetacean (Odontocete)	Sperm whale	<i>Physeter macrocephalus</i>	North Atlantic Stock	Yes	Large whale	3
	Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	Western North Atlantic Stock	No	Small odontocete	50
	Atlantic spotted dolphin	<i>Stenella frontalis</i>	Western North Atlantic Stock	No	Small odontocete	15
	Common bottlenose dolphin	<i>Tursiops truncatus</i>	Western North Atlantic Offshore Stock	No	Small odontocete	2,752
			Western North Atlantic Northern Migratory Coastal Stock			
	Long-finned pilot whale	<i>Globicephala melas</i>	Western North Atlantic Stock	No	Large odontocete	20
	Risso's dolphin	<i>Grampus griseus</i>	Western North Atlantic Stock	No	Large odontocete	20
	Common dolphin (short-beaked)	<i>Delphinus delphis</i>	Western North Atlantic Stock	No	Small odontocete	400
	Harbor porpoise	<i>Phocoena phocoena</i>	Western North Atlantic Stock	No	Small odontocete	82
Pinniped (Phocid)	Gray seal	<i>Halichoerus grypus</i>	Western North Atlantic Stock	No	Seal	4
	Harbor seal	<i>Phoca vitulina</i>	Western North Atlantic Stock	No	Seal	4